

Workforce Development

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A “Crisis in Aerospace”- that was how *Aviation Week and Space Technology* first described the impending shortfall of scientists and engineers. This description recognized that the tremendous strides made in the aerospace profession were the result of having an innovative and highly professional workforce of scientists and engineers. These talented professionals connected the world with advances in aviation and allowed us to walk on the moon, explore the universe with our deep-space probes and commercialize space.

George Muellner retired from the Boeing Company, February, 2008, as president of Advanced Systems for the Integrated Defense Systems business unit with responsibility for developing advanced concepts and technologies, and executing new programs prior to their reaching the System Design and Development phase.

Prior to this assignment Muellner was vice president-general manager of Air Force Systems, responsible for all domestic and international Air Force programs. He was appointed to this position in July 2002. Prior to that, Muellner was president of Phantom Works, Boeing’s advanced research and development unit.

Muellner became president of Phantom Works in June 2001, after serving as vice president-general manager since October, 1998, when he joined The Boeing Company. Prior to that, he served 31 years in the U.S. Air Force, retiring as a lieutenant general from the position of principal deputy for the Office of the Assistant Secretary of the Air Force for Acquisition in Washington, D.C., to which he was assigned in 1995.

From 1993 to 1995, he served as director and program executive officer for the Joint Advanced Strike Technology program, now the Joint Strike Fighter program. In 1992, he became deputy chief of staff for requirements for the Headquarters Air Combat Command at Langley Air Force Base, VA. He later served as mission area director for tactical, command, control and communications, and weapons programs for the Office of the Assistant Secretary of the Air Force for Acquisition.

A highly decorated veteran, Muellner spent most of his career as a fighter pilot and fighter weapons instructor, test pilot and commander. He flew combat missions in Vietnam and commanded the Joint STARS deployment during Operation Desert Storm.

Muellner is a Fellow of the Society of Experimental Test Pilots, a Fellow of the Royal Aeronautical Society, a Fellow and President of the American Institute of Aeronautics and Astronautics and serves on the Board of Directors of the Air Force Association. Muellner holds a bachelor’s degree in aeronautical and astronautical engineering from the University of Illinois, a master’s degree in aeronautical systems management from the University of Southern California, a master’s degree in engineering from California State University and a master’s degree in business administration from Auburn University. He also completed the Air War College and the Defense Systems Management College.

The shortfall in future scientists and engineers is caused by several factors: an aging workforce comprised heavily of “Baby Boomers” (those born between 1946 and 1964), a decline in both government and industry research and development investments, and an inadequate number of students pursuing undergraduate and graduate degrees in Science, Technology, Engineering and Mathematics (STEM).

Over the past several years, the U.S. National Science Foundation and U.S. National Academy of Engineering and Science chartered studies to identify the causes and recommend mitigating actions for the shortfall. These studies have prompted the U.S. Congress to create the Interagency Aerospace Revitalization Task Force. Despite all of these actions, metrics to date indicate little progress. The workforce crisis, or “silver tsunami,” is still approaching!

In May of 2008, the American Institute of Aeronautics and Astronautics hosted a forum in Washington, DC entitled “Working Together to Build the Aerospace Workforce of Tomorrow.” This forum identified key issues and specific actions necessary to overcome the impending workforce shortfalls. Those issues and actions are listed below and are best summarized by the task of **Attracting, Encouraging and Inspiring Top Talent**. The forum also identified that the shortfall is not unique to the United States but also is a challenge in Japan and Europe.

From the perspective of those growing up in the United States, supersonic jets and the Apollo program got us excited about a career in aerospace. Aerospace was a prestigious industry whose accomplishments filled the media every day – it was the employer of choice. Well, times have changed! The advances of aerospace have become commonplace to our younger generation and the aerospace profession has lost status in our society. **Therefore, an action must be to rekindle the enthusiasm for aerospace in our youth.** They must feel the excitement and aspire to be part of the aerospace profession.

A further challenge is that current educational and social values no longer emphasize a strong background in mathematics and science. Throughout the educational system, the discipline, work ethic and technical focus that are the foundation of careers in science and engineering are not appropriately valued and encouraged. In many cases, school systems lack adequate numbers of teachers qualified to teach mathematics and science. Thus, even those students attracted to a career in science and engineering often fail to get the preparation needed to complete a degree in science, engineering or mathematics. **Therefore, our second action must be to reinvigorate the enthusiasm for and the teaching of Science, Technology, Engineering and Mathematics in our pre-college education system.**

Many of our colleges experience significant drop-out rates in science and engineering curriculum due to loss of interest and difficulty understanding the application of the science and mathematics principles. While our colleges must provide a strong and balanced foundation in mathematics and engineering science, they must also provide early exposure to hands-on design and research opportunities. In fact, research experiences significantly increase the number of graduates who pursue advanced degrees. **Therefore an important action is to provide our undergraduate and graduate students hands-on design projects and research opportunities throughout their college career.**

Attracting young people to the pursuit of careers in aerospace is only the beginning. These young professionals must be given the opportunity to do exciting work that makes a contribution to society. They must receive recognition for their professional abilities and their efforts as part of a team. They must receive career mentoring and the opportunity to lead a balanced life and they must be compensated for performance – not time in the job. **Thus, we must create the work environment that provides for an exciting, challenging and rewarding career and life style.**

Each of these actions is necessary if we are to stimulate and nurture a “Passion for Aerospace” and build that workforce of tomorrow. While there are certainly actions by the government that can facilitate many of these necessary actions, we, the professionals of aerospace, are best equipped to rekindle the “Passion for Aerospace.” We are best equipped to reach out and inspire young people with the contributions of aerospace to society. We are best equipped to provide tutors and mentors to our schools systems and to our young professionals. We have the ability to influence college curriculums to provide earlier hands-on experience and provide internships and research opportunities to our college students. We have the responsibility to create the work environment that excites young professionals and once again makes aerospace the employer of choice.

The bottom-line is that creating the global aerospace workforce of tomorrow is our task. Re-kindle the passion for aerospace that we all enjoy and the workforce of tomorrow will follow.