

Recruiting, Retaining, and Developing a World-Class Aerospace Workforce

An AIAA Information Paper

Overview

The American Institute of Aeronautics and Astronautics (AIAA) – the world’s largest technical society dedicated to the global aerospace profession – is extremely concerned about the need to maintain and enhance a strong aerospace workforce, without which the United States would lose invaluable economic and national security benefits. Since aerospace constitutes about \$200 billion (or 1.5%) of the domestic economy, and in 2007 delivered a \$56 billion positive trade balance, it is critical during the continued challenging economic climate to keep this sector healthy and growing. AIAA believes that the unique criticality of workforce issues in the aerospace industry warrant urgent discussion in Congress regarding measures to maintain U.S. leadership and excellence in this important and highly strategic industry.

Background

As noted above, aerospace represents about \$200 billion (or 1.5%) of the domestic economy and in 2007 provided a \$56 billion positive trade balance. The aerospace workforce is the foundation of the industry’s success, yet unique workforce demographics now present urgent challenges. Figure 1ⁱ shows the age distribution of the aerospace workforce compared to the total U.S. workforce. Up to half of the current aerospace workforce will be eligible for retirement within five years. Aerospace workforce composition does not match national demographic averages. Compared to the total U.S. workforce, the aerospace industry and NASA have a disproportionately large percentage of workers aged 40 to 55, and a disproportionately small percentage of workers younger than 40.

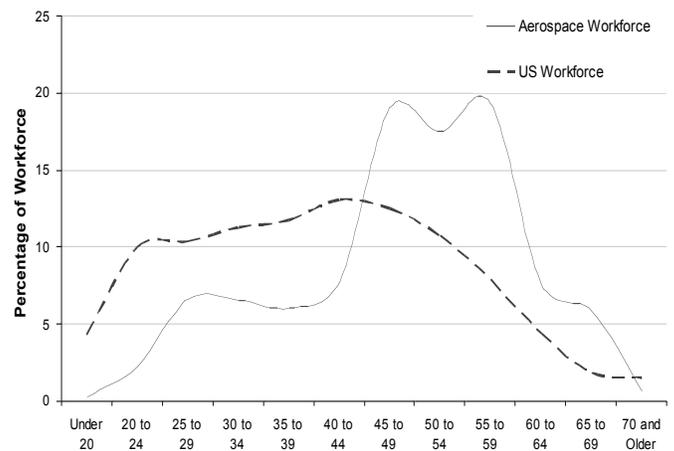


Figure 1: Age distribution of the aerospace business workforce compared to the total U.S. workforce

If talented young engineers are not recruited, retained, and developed to replace the workforce generation that is near retirement, then the U.S. stands to lose the valuable economic and critical national security benefits of the domestic

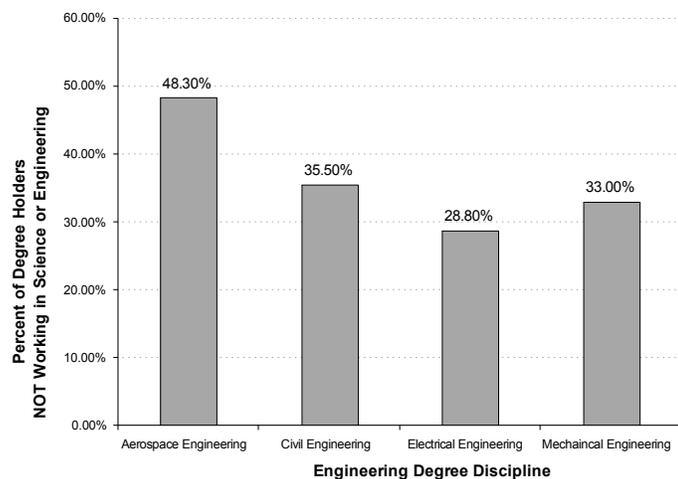


Figure 2: Percent of engineers working outside the engineering and science professions

aerospace industry. As shown in Figure 2ⁱⁱ, large percentages of engineers are working outside the science and engineering professions. Engineering students burdened with college loans are seeking greener pastures. As shown in Figure 3ⁱⁱⁱ, aerospace engineering salaries are low compared to other industries. If the U.S. is to retain its edge in this industry, salaries need to rise and incentives given for entering the industry. Further, since 1980, the number of nonacademic science and engineering jobs has grown at more than four times the rate of the U.S. labor force as a whole.² With a growing number of science and engineering jobs anticipated, the supply of visas set aside under law for “highly qualified foreign workers,” – 65,000 a year – is not enough. A decline in student, exchange, and temporary high-skilled worker visas issued since 2001 interrupted a long-term trend of growth. The number of student visas and of temporary high-skilled worker visas issued have both

declined by more than 25% since FY 2001. These declines were due both to fewer applications and to an increase in the proportion of visa applications rejected.^{iv} To add to the supply pressures of science and engineering workers in our economy, there is increased recruitment of high-skilled labor, including scientists and engineers, by many national governments and private firms. For example, in 1999, 241,000 individuals entered Japan with temporary high-skill work visas, a 75 percent increase over 1992.^v

Research and development expenditures keep the aerospace industry strong and help maintain U.S. leadership in this sector. As shown in Figure 4, the R&D tax credit is working to increase corporate spending on this important activity. In the

early 1990s, after implementation of the R&D tax credit legislation, private expenditures on R&D rose.^{iv} Yet even with this incentive, U.S. industry research and development funding is lagging. In 2001, U.S. industry spent more on tort litigation than on research and development. Perhaps as a result, American companies are lagging in patents. In 2005,

only four American companies ranked among the top 10 corporate recipients of patents granted by the United States Patent and Trademark Office. And to further add to this distressing R&D dollars situation, federal research funding is lagging as well. The amount invested annually by the U.S. federal government in research in the physical sciences, mathematics, and engineering combined is less than what Americans spend on potato chips^{vi}. Student loans, research dollars to support universities, and service scholarships can provide incentives for younger workers to consider aerospace and join the industry.

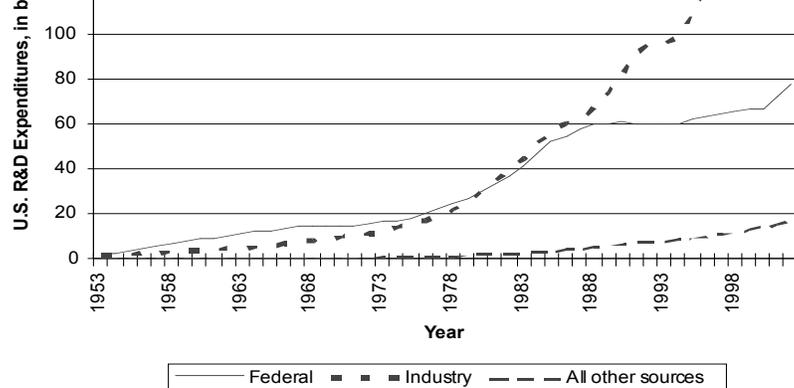


Figure 4: U.S. R&D expenditures of federal government, industry and other sources

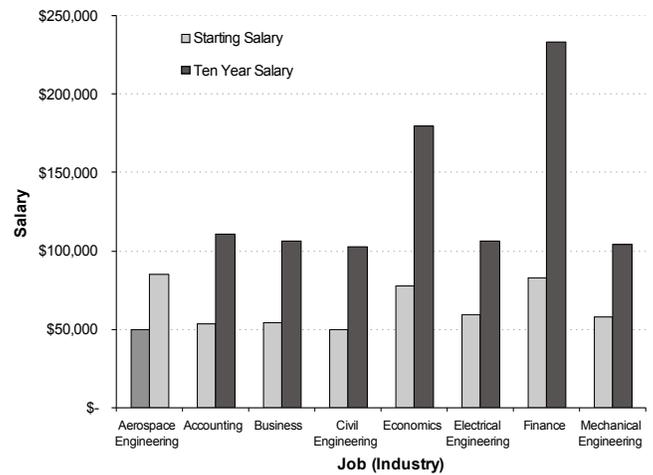


Figure 3: Starting and ten year salaries of various industries

ⁱ From Garth Henning and Richard Leshner, NASA, presentation to the Committee on Meeting the Workforce Needs for the National Vision for Space Exploration, February 22, 2005.

ⁱⁱ National Science Board, *Science & Engineering Indicators – 2002*

ⁱⁱⁱ www.studentsreview.com/salary_by_major.php3

^{iv} Committee on Prospering in the Global Economy of the 21st Century: An Agenda for American Science and Technology, National Academy of Sciences, National Academy of Engineering, Institute of Medicine, "Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future," February 2006 Edition.

^v www.nsf.gov/statistics/seind04/c3/c3h.htm

^{vi} How Much Do Americans Pay for Fruits and Vegetables / AIB-790, Economic Research Service/USDA