

**Testimony of Dr. Stanley Sorscher,  
Society of Professional Engineering Employees in Aerospace,  
International Federation of Professional and Technical Engineers Local 2001**

**U.S. Senate Committee on Commerce, Science and Transportation,  
Subcommittee on Aviation Operations, Safety, and Security**

**Hearing addressing Competition Issues to Maintain US Leadership in the  
Aerospace Market**

July 18, 2012

Thank you Madam Chairman and members of the Committee for bringing attention to competition issues in the aerospace industry.

My name is Stan Sorscher. I am on staff at the Society of Professional Engineering Employees Association (SPEEA), a labor union representing over 24,000 engineers, scientists, pilots, technical and professional employees in the aerospace industry.

We share concerns of other industry stakeholders regarding our aging workforce, knowledge transfer, and our capacity to deliver the next generation of workers. We agree that we face challenges attracting talented students and retaining skilled workers who currently contribute to the success of the aerospace industry.

From our perspective, this challenge has two basic elements. First, we need to offer students, families and workers a sense that aerospace can give them a career, with some sense of job security. This is a fundamental market signal that any occupation needs to send.

The second element arguably applies more to aerospace than to other industries.

Aerospace products are complex and heavily engineered. This industry is known for its very demanding development programs, followed by steep learning curves. This gives a competitive advantage to employers who have capable and effective engineering and manufacturing communities with strong problem-solving cultures. I think anyone who has worked in an aerospace development program can appreciate that assertion, without meaning any disrespect to hard-working and very productive workers in other industries.

Public policy plays a key role in addressing these issues and ensuring industry demands match the interests of students and workers.

In terms of the national labor market, that means employer- and government-supported training opportunities for interns, new hires, mid-career mobility, and transition from military to civilian work. We need to manage knowledge transfer from one generation of workers to the next.

We have considerable policy leverage through education and training programs, publicly funded research and development, investment in air traffic control, airport infrastructure, airplane certification, and our approach to safety.

## **Globalization has changed the workforce model**

In recent decades, both aerospace manufacturing and airline service operations moved from integrated business models, to more fragmented or decentralized business models that rely heavily on global supplier networks.

We often hear a business perspective, that many activities are becoming more commodity-like, more cost-driven, and less performance-driven. Commodity-like activities can be outsourced locally or globally.

This reflects directly into our workforce strategies. A performance-driven company often holds its competitive advantage as a body of knowledge in a skilled and capable workforce. This type of company typically invests in worker training, knowledge transfer and lifelong learning.

Companies in commodity-like markets typically rely more on market relationships, and a broad supplier network. Competition turns on cost and delivery. In this business model, a firm draws labor from the external labor market, as needed.

When we talk with investors and financial analysts, they point to industries that successfully dismantled their integrated design and manufacturing communities. They cite running shoes, ladies garments, cell phones, hard drives, the motion picture industry and others. Some of these industries make products that are complex, highly technical, and creative.

We argue, "Aerospace is different." The 787 development program reminds us that aerospace manufacturing is still performance-driven. We can take similar lessons from the NextGen Air Traffic Control system, any number of military and space programs, the border fence project, or many other complex heavily engineered products in our industry. Our business is very difficult, on its best day.

## **Workforce strategies**

We would design one set of policies for workforce development, education and training for a mature commodity-like industry, but different workforce policies entirely, when our industry is performance-driven. Leading firms will attract and retain skilled workers if they believe their competitive advantage is held as a body of knowledge in their workforce. Employers will use different workforce strategies if they think workers are largely interchangeable in a global labor market. In the transition from integrated to decentralized global business models, training costs are typically externalized to employees and the public.

## **Demographic problem**

In the mid-90's aerospace employers began dismantling the integrated design and manufacturing communities. Figure 1 gives one instance of the aging workforce problem. Around 1990, a very large group of young engineers was hired for the 777 airplane program. Over the course of that program, older experienced workers transferred knowledge to the younger ones. In practice, this involved building a network of relationships, exchanging informal information, and establishing trust and confidence at the technical level. This is how a great deal of essential coordination takes place.

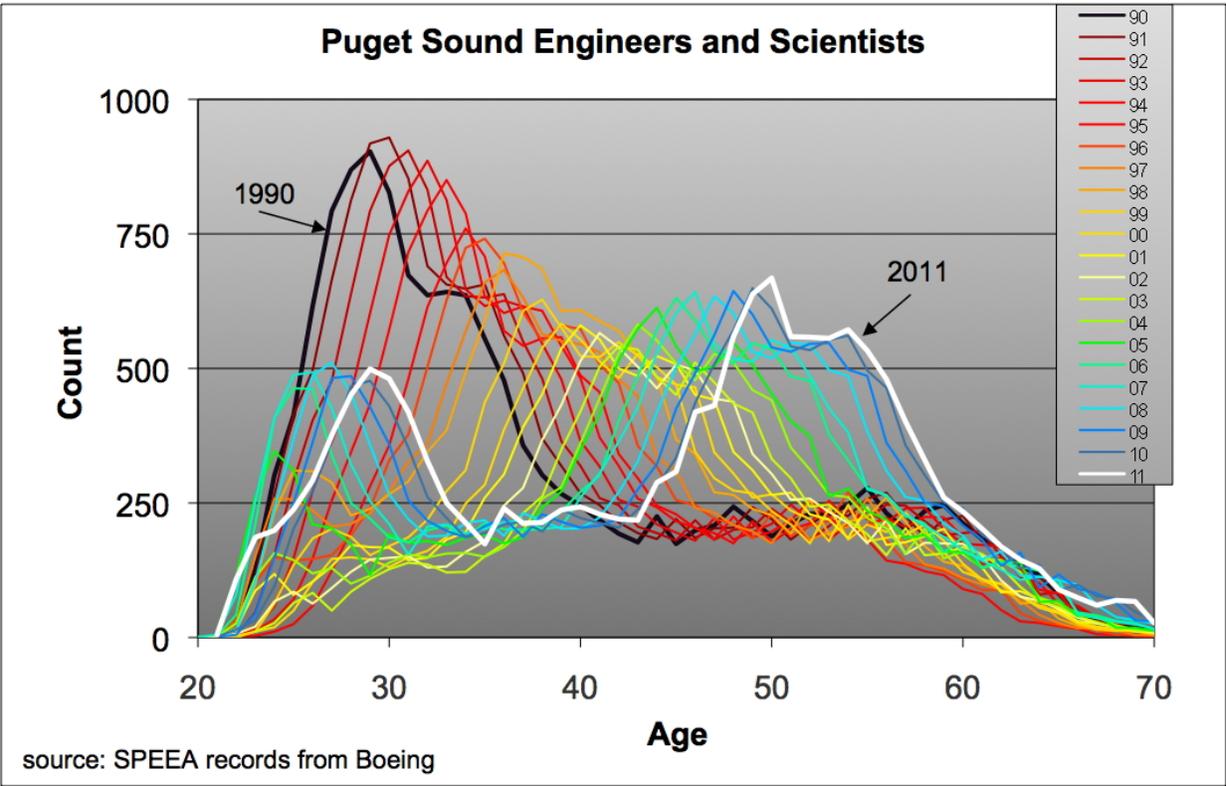


Figure 1. Demographic shift from 1990 to 2011 for engineers and scientists.

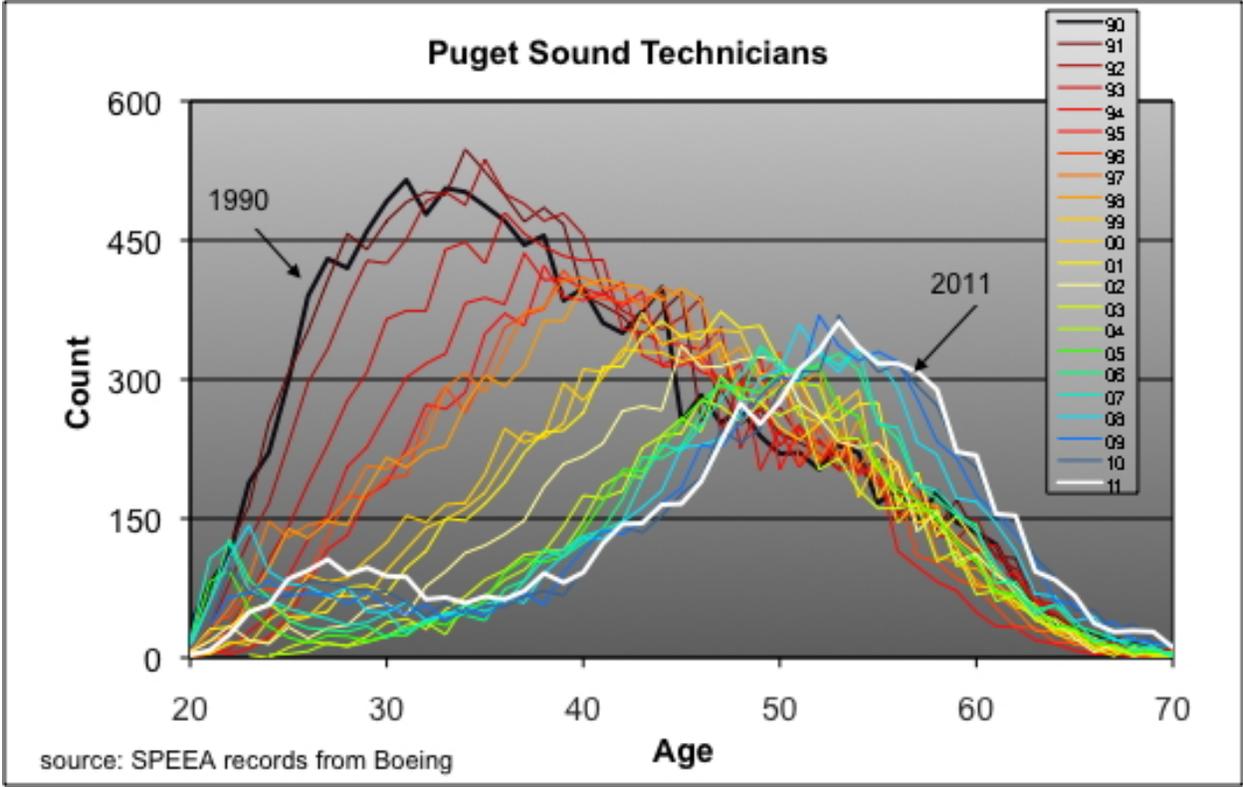


Figure 2. Demographic shift from 1990 to 2011 for technical workers.

That cohort of employees is now in their mid-fifties – within a few years of eligibility for early retirement at age 55. Very few engineers work to full retirement age of 65.

Figure 2 applies to technical workers, such as drafters, planners, laboratory technicians, and inspectors. The demographic bow-wave for technical employees is more dire.

Since the 90's, hiring has been weaker, and successive rounds of layoffs fell mostly to younger workers. In a sense, the aging workforce problem is one of our own making, driven by changes in business models.

Similar demographic patterns apply to hourly aerospace workers, and NASA scientists. European unions tell us that the Airbus workforce has similar demographics.

### **Trade and investment policies**

Our national trade and investment policies encourage global economic integration, rather than specialization, contrary to predictions from classical trade theory. Integrating with the global economy is consistent with commodity-like products, but misses the mark when products are performance-driven.

We should think in terms of a national manufacturing strategy. Every country in the world has a manufacturing strategy. By definition, a national manufacturing strategy should express our national identity, rather than a global identity.

### **Workforce data as a policy-management tool**

Regarding workforce, we are in the curious position where employers report that they can't find experienced workers, but new graduates can't find jobs in their field of study.

If we expect students and their families to invest in aerospace careers, we need to reassure them about the transition from education to employment. Tracking students as they enter the workforce would give us a valuable policy-management tool. When students graduate from community college programs, or engineering schools, or certificate programs, how many find jobs in their field of study? How many stay in their occupation or industry or geographic region for one year or for five years?

Canada, Australia, and the UK track their workforce and education programs in more detail than we do. This gives their policy-makers reliable data to understand where labor shortages occur, how many workers they will need, in what occupations, and for how long. Most large firms manage their internal labor markets with the best data available. We should make policy decisions based on credible, meaningful, and actionable data.

We are working with state agencies to assess the feasibility of connecting educational records to employment records. Some of their work was funded through the stimulus package. Schools tell us they want this type of data. Some schools track their own statistics, but they work in isolation, on an *ad hoc* basis.

After we make our public investment in education and training, we should expect a reciprocal commitment from industry to hire graduates of these programs, and capitalize on our investment in human capital.

### **Mid-career Training**

Many mid-career training programs are offered as part of a social safety net, after layoffs are announced. Mid-career training for employees who are not at risk can be a competitive edge. We also see demand for training programs for the mid-career transition from military to private employment.

### **Temporary Work Visas**

Families and students are making “once-in-a-lifetime” investments in education and career choices. We send our students mixed signals when we raise the costs and risks of going to school, then tell the graduates to compete for entry level jobs with 800,000 foreign temporary high-tech workers, for careers with doubtful job security, in industries that are steadily shrinking as a percentage of GDP. We should not short-circuit our students’ labor market when they graduate from school.

### **Connection between education and employment**

Apprenticeship programs answer the education-to-employment question directly, since an employment relationship is built into apprenticeships, by definition.

Boeing and other large employers have excellent paid internship programs with good track records of recruiting and retaining students. They also offer excellent life-long learning programs. We should encourage and extend these programs.

SPEEA has proposed that publicly funded research and development include provisions for co-ops or collaborations, so that research students are exposed to work environments in the private sector. Students would gain an advantage in hiring, and this would help anchor intellectual property in the domestic economy.

We should revisit the Bayh-Dole Act, which releases any public interest in new intellectual property to universities and other agents for commercialization of publicly funded research. We support R&D as a way to create good jobs in America. As it works today, the Bayh-Dole Act emphasizes commercialization of new intellectual property, which is fine. However, we don’t finish the sentence by saying “in America.” We should update the Bayh-Dole act to close that loop, adding “in America,” figuratively, at the end the sentence.

### **Policies for maintenance and airline operation**

We cannot neglect national investments in air traffic control, airport infrastructure, airplane certification, and safety programs. One lesson we are learning is that to manage global operations for manufacturing, maintenance, certification and safety, we need close awareness and a minimum level of technical coordination. We cannot rely entirely on contractual arrangements or formal agreements.

These are complex technical issues. Private sector firms and public agencies need capable technical workforces and strong problem-solving cultures to manage these issues effectively.