



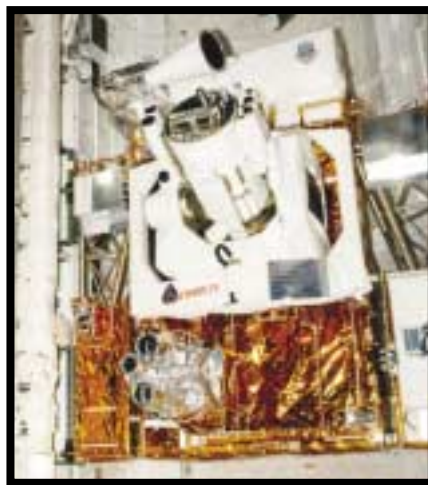
WITH THE RECENT expeditions to Mars and talk of landing on the moon again, being involved in the space industry is becoming 'cool' once more. However, this industry has a growing concern. A lot of seasoned NASA and Air Force space engineers and scientists will be retiring soon and, as such, they are facing a problem of filling that void due to a lack of educational and research activity.

Although it is at its worst in the US, the problem stretches worldwide. Among others, Europe will soon encounter a similar situation, but with a few years grace, as the continent joined the space race a little later than its US counterpart.

"It's a multifaceted problem – retirement and education based," explained Harry Ames, deputy director of Utah State University's Space Dynamics Laboratory in the US. "This is a hard industry to be in. It is a relatively high-risk business and the pressures are tremendous. As you age up to the 60-year old bracket, you find your body just doesn't have the tolerance for the 20-hour days you put in sometimes, so people are retiring early and taking all the knowledge with them. Meanwhile, our student population is opting not to go into the aerospace sciences, such as physics and electrical engineering, in favour of software," he added.

## THE FINAL FRONTIER?

Who will work on the future space programmes after the current generation of ageing space engineers and scientists leave, asks **Keri Allan**



**Top: Engineers at SDL tape thermal blanketing on the SABER infrared telescope in preparation for final testing**

**Above: SDL's Infrared Telescope awaits launch in the cargo bay of the space shuttle**

"There's certainly a similar problem in the UK, but I think the reasons might be a little different," noted Professor Martin Barstow, professor of astrophysics and space science at the University of Leicester. "One is the lower take up of science and engineering degrees and the second is that, at least within the universities and space research in this country, salaries are not particularly good, so recruitment and retention is a problem."

"In terms of retention, the money is definitely one aspect that turns people away. If you want to earn two or three times your salary then you go to work in the computer and IT industry," he explained.

The other aspect is the work environment itself. In a giant like the space engineering industry, it is not always 'hands-on' engineering, plus many of the new recruits have to shout to get their ideas

heard and they often don't get the credit they deserve. "Customer paperwork can comprise 50% of the day of an engineer in our business. No one likes to do that much paperwork, especially not the brilliant youngsters upon which this burden eventually must rest," said Ames.

"In addition, the young technical person is very conscious of identity and uniqueness. That is lost when you are one of 150,000 on the same complex of buildings in Los Angeles, Seattle or Maryland," he said. "The road to the top is obscure and your early career will likely have as many cancelled programmes in it as completed ones."

This isn't to say that a crisis is at hand, but it is something that needs serious contemplation. Those least affected by this problem at the moment are commercial companies like EADS Astrium who are involved in the 'sexy' side of space engineering. These companies are already seeing many retire and are having to recruit larger amounts of people, but they are not seeing a huge problem in finding them. "What we have I suppose, would be called a rather sexy industry. A lot of people want to come into our business and so we probably benefit from that," said Alistair Scott, director of communications for the UK, EADS Astrium.

Ames also believes that the 'sexy' topic of Mars has made space more interesting, but he believes more people will be interested in being observers rather than participators. "Certainly there's going to be a very large number of folks going into our business, but the deficit is going to be very, very large as the so-called Baby Boomers retire out," he noted.

For the majority of the industry, the problem does exist and will only get worse. Ultimately, the industry won't be able to find the right technical staff for the roles and the problem of losing engineers to more 'fun' and well-paid industries such as IT and software will grow.

As well as recruitment and retention, another problem that arises from this wave of retirements is the lack of knowledge transfer. "We've not been very good at

capturing and transferring that aggregate wisdom to the techno-nerds of the following generations," said Ames. "There's the problem of transferring four decades of what's in our brains to the younger folks. It's going to take time to learn otherwise we could start reinventing some of the problems because the lessons weren't adequately passed on."

Solutions are now coming about to help overcome this problem for the US; its government has begun looking into possible ways of easing this problem by setting up the 'Commission on the Future of the United States Aerospace Industry'. Many universities and laboratories are also putting



[Photo courtesy of NASA]

plans into action; working both with industry and the government to give further training to those interested in the industry and prepare them for the environment they will be working in, all with the aim to aid recruitment and retention. The results from such schemes will, hopefully, guide Europe and, also, stop it from making the same mistakes.

In the UK, similar ideas are being thrown about and many believe the whole educational system needs to be looked at. "We have to address the overall science education problem, because if you have more people interested in doing science and engineering degrees that will solve part of the problem," said Barstow.

"The other thing is to do inspirational things that brings people in; things like some of the new ESA initiatives, the main one being Mars exploration," notes Barstow. "I find this quite aspiring and I hope it will feed into the rest of science industry and education. But then, we've got to make sure that we direct the effort and money into those areas and things that brought the people to us in the first place." ■

**Left: A Russian cosmonaut stands next to the Lada growth chamber in the International Space Station**

**Below: Technicians work on SDL Thermal Optical Research (THOR) vacuum chamber**

