

# The future aerospace engineer

Good morning everyone.

It's a real pleasure to join you today.

And to have this opportunity to address such an expert audience.

The theme we've been discussing today is of particular interest to me.

Not just because I'm Aviation Minister.

But because I'm also passionate about engineering and education.

We're fortunate to live in a country which for much of the past century has been a global aerospace leader.

But right from the start, that leadership has depended on a ready supply of skilled engineers...

Skilled engineers who we once had in abundance...

Bolstered by the numbers of military aviation specialists who after WW2 were recruited to work in the industry...

And who helped Britain's aerospace industries build a formidable reputation during the 1950s and '60s.

Indeed, we excelled in developing and nurturing engineering talent up to this time.

Schools and universities prepared students for careers in manufacturing, construction or industrial design, and generations of youngsters learnt their trade through apprenticeships.

But in the later decades of the 20th century...

As we gradually invested less in infrastructure and manufacturing...

Fewer youngsters chose to study subjects which could lead to an engineering career.

That's left us today with a dearth of young, skilled engineers.

One estimate suggests the country needs another 1.8 million engineers and technicians by 2025...

Including many tens of thousands of vacancies in UK aerospace.

Women and ethnic minorities in particular reject careers in engineering at an early age...

Often before they reach secondary school.

As a result, the industry remains male dominated.

According to a survey, half the aerospace workforce is over 45 years old...

Almost a quarter of staff are over 55...

And for the largest employers, almost 20% of staff are eligible to retire...

Figures which highlight the urgent need to engage students and inspire them to consider a career in aviation.

But I believe there are good reasons to be positive.

In fact, the prospects for young engineers today are tremendously exciting.

We're investing more in infrastructure than at any time in living memory.

Manufacturing has been growing steadily.

And we are becoming a centre for high value engineering once again, powered by the rise of big data, machine learning and artificial intelligence.

Particularly in aerospace.

We still have the third largest aerospace industry of any country in the world – and the largest in Europe.

We have a unique combination of major tier-one suppliers, which account for over 90% of industry employment and turnover...

But this is combined with around 2300 small aerospace firms, which specialise in niche areas of the market...

And increasingly, in emerging technologies.

So there's a great spread of opportunities for engineers.

There's also a level of long term job security that few other industries can match.

The rewards are attractive too.

Aerospace earnings are around a third higher than the average manufacturing wage...

And 43% more than the national average salary.

But my optimism is not merely based on the incentives that might attract talented youngsters to a career in aerospace engineering.

It's also based on the clear commitment of the industry, government and academia to address the skills challenge...

And our collaborative efforts to create an environment in which many more talented youngsters are drawn to a career in aviation.

You've been hearing today about schemes like the Brunel Challenge.

Designed to create world leading engineering capabilities in advanced UK manufacturing.

I know that many leading players within the sector have raised their commitments to recruiting apprentices and graduates.

From companies like Rolls-Royce...

Which is a principal partner in a social media marketing campaign called This is Engineering...

One of Rolls-Royce's degree apprentices –Bethan – was featured in the online video series, which has received over 28 million views to date.

To Flybe, which has partnered with Exeter University to support aircraft engineering degrees.

But we in government are also determined to play our part.

First, through our overarching Industrial Strategy...

Which recognises the crucial importance of this industry to Britain's future prosperity by including an Aerospace Sector deal.

Among the key priorities of the deal is to enhance co-operation between the industry and academia to ensure a strong supply of talented employees.

In order to deliver on the education and skills requirements of this Sector Deal, we have to understand how the fourth industrial revolution will affect aerospace, and how that in turn will require a response from schools, universities and industry educational bodies...

For example, as aerospace moves away from manual work towards automation and electrification.

Many of the same objectives also run through our new Aviation 2050 Strategy, which we have just finished consulting industry on.

This is a comprehensive document defining aviation's long term ambitions to 2050 and beyond...

Including how we tackle the skills shortage and attract the right number of recruits to drive aviation's future growth.

The Strategy will identify where efforts need to be focused...

Helping shape and direct future skills and training policy for the industry.

For example, addressing the slow uptake of the apprenticeship levy.

And using apprenticeships to improve diversity in our workforce.

The launch last year of the Charter for Women in Aerospace and Aviation was a really positive step forward.

When a pioneering group of 48 aviation employers made a public pledge to do something the industry had never done successfully before...

Begin to tackle the profound gender imbalance in modern aviation and aerospace...

And work towards a future where women can enjoy the same career opportunities, prospects and rewards as men.

Not just to boost the number of female school leavers and graduates joining the industry.

But also to address the lack of women within aviation boardrooms...

And on the flight deck too...

Where men still outnumber women by 15 to 1.

In a modern economy like Britain, where we believe in equality...

Equality of gender, equality of opportunity, and equality of pay and benefits...

Such wide discrepancies between the sexes should belong to the past.

I know there's some excellent work going on around the industry to tackle this important issue.

Airlines like Virgin and EasyJet are focused on attracting more female pilots and engineers.

And Stansted Airport College is inspiring thousands of young girls to consider a career in aviation.

So I was delighted to announce recently that the Charter had reached 100 signatories.

A key part of the challenge is to encourage more students into STEM education and training...

And to give everyone the chance to pursue a career in aviation and aerospace, whatever their background, and regardless of whether they come through a technical or academic route.

The process begins at primary school, and continues through to higher education.

In schools, we are providing the building blocks...

Investing an additional £406m in education and skills to support the Industrial Strategy...

By boosting spending on maths, digital and technical education to help address the shortage of STEM skills.

And it's paying off.

Entries to A level maths have risen 90% since 2004.

Maths is now the most popular A level, taken by 27% of post-16 students taking A levels.

And in 2018, there were almost 50,000 more entries to STEM A levels than in 2010 – a 23% increase.

I believe the measures we are taking will enable the next generation of engineers to have the highest quality STEM education at school.

This is designed to provide a firm foundation for their journey to employment, enabling them to consider the diverse range of roles across engineering.

Improving diversity and inclusion is of course critically important to our success.

So – first of all – we are seeking to understand why those from under-represented groups are not pursuing careers in STEM...

And in particular, why girls have not chosen to study maths, computing and physics.

We've seen a modest improvement in recent years.

There has been a 26% increase in girls' entries to STEM A Levels since 2010.

But there is still much more to do to ensure that girls are reaching their potential and are equally represented in all subjects.

Among the programmes which is helping to boost uptake is STEM Ambassadors...

A network of over 30,000 volunteers with backgrounds in STEM disciplines...

Who visit schools, science clubs, and youth groups, giving their time and enthusiasm to inspire the next generation.

Engagement with STEM employers is also an essential component of our careers strategy, so young people understand how they can apply their skills and interests across a wide variety of career paths that are open to them.

The 2018 Year of Engineering gave us a great opportunity to work with around 1,400 organisations from across the engineering sector – and beyond – to inspire a new generation of world class engineers.

It was a tremendous success.

But it is now important that we build on that legacy, maintain the spirit of collaboration, and continue to provide youngsters with real-life experience of the engineering workplace.

So, to sum up.

I think today's conference has articulated the challenges we face as an industry...

And highlighted many of the solutions...

To secure the long-term supply of engineers we need to compete and thrive in a competitive global marketplace...

And to seize the opportunities that the Fourth Industrial Revolution will bring.

The breadth of employers represented in this room today shows that the route to success lies through partnership.

Through our ability to come together, agree strategies, and then put them into action.

That's something I'm totally committed to.

As your aviation minister, my door is always open to you to provide support, and access to other government departments which also have a large stake in aerospace engineering...

And I look forward to building on the progress already made...

Getting more students to consider engineering as a profession...

And helping Britain's future aerospace industry to mirror the huge achievements of the past.

That's our shared goal.

Thank you.