ROYAL AERONAUTICAL SOCIETY

ADDRESSING CIVIL AVIATION ENGINEERING AND MAINTENANCE PERSONNEL SHORTAGES

RAeS Position Paper

March 2026

This paper has been produced by the Royal Aeronautical Society in collaboration with Matthew Siggens CMgr FRAeS, RAeS corporate partners and subject matter experts from airworthiness organisations.

About the Royal Aeronautical Society (RAeS)

The Royal Aeronautical Society is the world's only professional body and learned society dedicated to the entire aerospace, space and aviation communities.

Established in 1866 to further the art, science and engineering of aeronautics, the Society has been at the forefront of developments in aerospace ever since.

The Society seeks to promote the highest possible standards in aerospace disciplines, provide specialist information and act as a central forum for the exchange of ideas, and play a leading role in influencing opinion on aerospace matters. As such, we provide authoritative, independent, and evidence-based reports, briefings, opinions and events.

Our global presence is expressed through our divisions and branches across the globe and our expertise is expressed through our 23 Specialist Groups who work across a whole range of areas.

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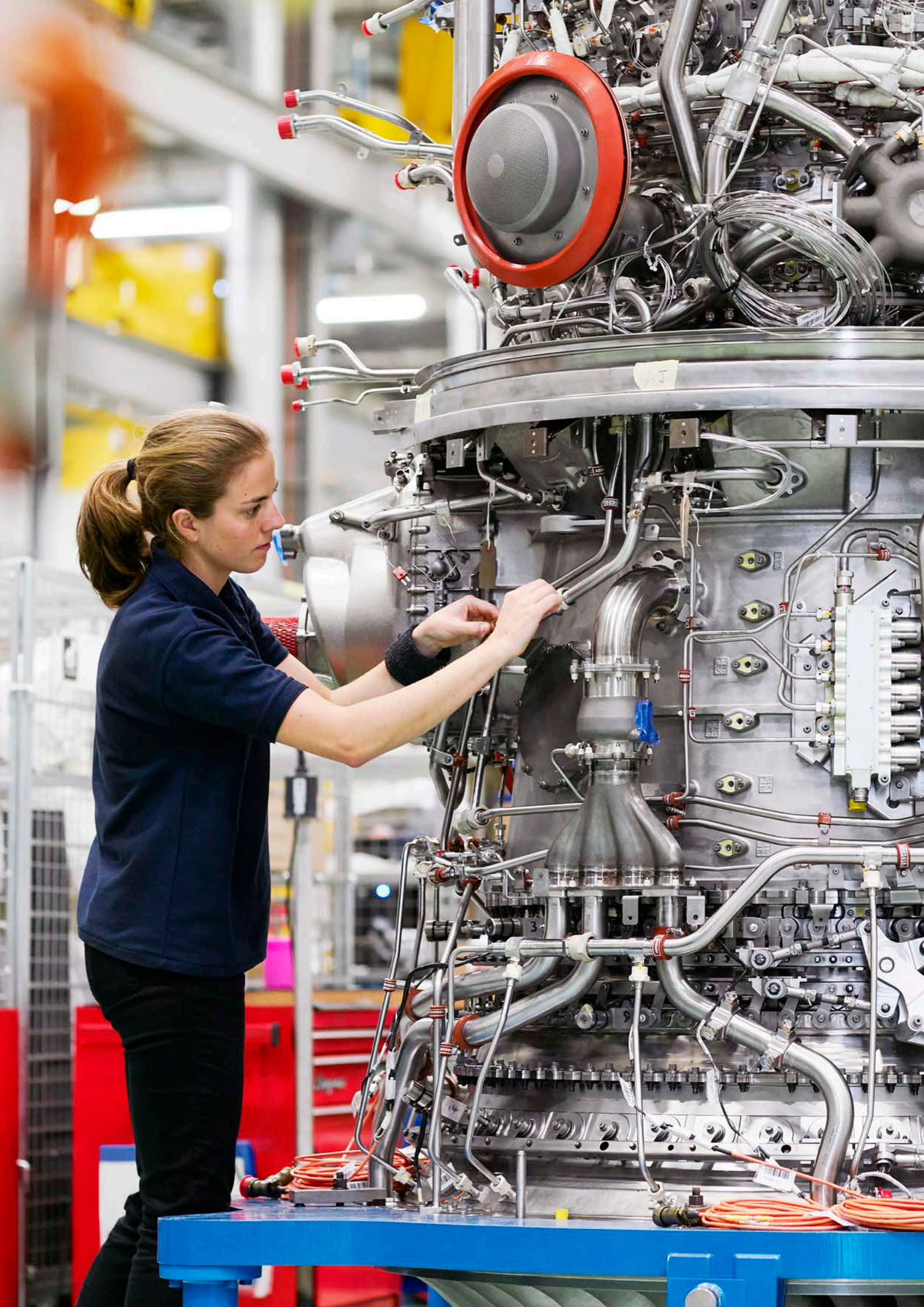

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Executive Summary

The UK civil aviation sector faces a severe and worsening skills shortage in aircraft Maintenance Repair Organisations (MROs), Part-145s, Continued Airworthiness Management Organisations (CAMO), and Training Organisations, or Part-147s and colleges, threatening operational resilience, safety and global competitiveness.

Closing this gap is critical to maintaining the UK's leadership in aviation maintenance standards. Without a coordinated, industry-led strategy supported by academia and government, the shortage will continue to deepen, impacting performance, increasing safety risks, and constraining economic growth.

This paper builds on the Society's *Aircraft Maintenance Engineering – The Challenge of the Future* (May 1999)[1] report and serves as both a status update and **call to action**. Drawing on industry survey data, CAA Engineer licensing trends and stakeholder interviews, it outlines key challenges, causes and proposed solutions.

Responses from 48 continuing airworthiness organisations, including 38 CAA-approved Part-145 MROs for fixed and rotary-wing aircraft, surveyed between March-June 2025, provide a snapshot of the current skills and labour landscape.

KEY FINDINGS

- **Ageing Workforce and Weak Pipeline:** Over 50% of licensed engineers are over 50; fewer than 10% are under 30. Retirements outpace recruitment, and new hires will not achieve Category B Licensed Engineer[2] status until 2033. Salaries are rising sharply.
- **Salaries are rising:** Between 2019 and 2025, salaries for Category B1 and B2 licensed aircraft engineers have risen by approximately 66%.
- **Declining Licensing:** UK-issued Part-66[3,4] licenses had an accelerated decline post Covid-19 and with Brexit, driven by EU competition, retirements and limited training capacity.
- **Training Gaps:** Few organisations deliver industry-required outcomes. Training is costly, unevenly distributed and lacks adequate funding. Employer support for apprenticeships and modular pathways is insufficient and inconsistent.
- **Fragmented Initiatives:** Numerous groups and charities exist, but poor collaboration has failed to deliver impactful solutions.
- **Interest Without Access:** Young people show interest, but weak educational foundations, poor careers advice, and limited outreach hinder conversion into careers.
- **Insufficient Investment:** Sporadic industry investment and inadequate government support, such as stagnant apprenticeship levy bands and poor measures of success have compounded the problem.
- **Regional Disparities:** Training provisions and employer engagement are scarce in some regions, notably the North of England and parts of Wales.

PRIORITIES

1. **A National Skills Strategy for Aircraft Maintenance:** Convene government, industry, regulators, and education providers to co-develop a coordinated roadmap, backed by data.
2. **Increase technical college foundation courses:** School-leavers are not adequately equipped with the technical skills required to start aviation training programmes. Improve coordination between existing training schemes.
3. **UK maintenance organisations:** Continue to urge the Department for Transport to unilaterally recognise EASA Part-66 licences and a Part 147 Certificate of Recognition (CoR) for training received.
4. **Accessible Training and Licensing Pathways:** Encourage industry alignment and investment to increase the number and regional spread of training organisations (CAA approved and unapproved), promote modular training options and consider expedited licensing for experienced technicians.
5. **Career Visibility:** Embed aircraft maintenance into a national outreach curriculum for aviation and aerospace, broaden employer-education partnerships and widen career signposting across the UK.
6. **Data Collection and Workforce Intelligence:** Enhance workforce data on age, demographics and licensing flows to support better planning and targeted interventions.
7. **Employer Participation:** Consider grants or tax incentives for employers and organisations supporting apprenticeships and training. Redirect any unused apprenticeship levy.

[1] https://www.aerosociety.com/media/28904/raes-aircraft-maintenance-engineering-challenge-for-the-future-1999.pdf
[2] Category B or Cat. B licensed engineers sign off work performed during an aircraft's depth maintenance and it typically takes eight years to be considered competent and effective in this certifying role.
[3] UK Part-66 | UK Civil Aviation Authority.
[4] Part-66 is the regulatory standard for Aircraft Maintenance Engineer Licensing (AMEL).

BACKGROUND

The RAeS report, *Aircraft Maintenance Engineering – The Challenge of the Future*, produced in May 1999, was discussed in the *House of Commons Environment, Transport and Regional Affairs* – 14th Report[5].

Its recommendations urged action to safeguard high-value jobs and aviation safety standards, warning of a "significant shortage of appropriately skilled labour" due to reduced supply from the armed forces, manufacturing and airline apprenticeships. Parliament agreed the aviation industry bore primary responsibility for addressing this issue and encouraged commercial aviation to support General Aviation as a talent pipeline.

A quarter of a century later, the findings of the report were validated with a shortage of competent engineers and support personnel which has now become a persistent and pressing concern across continuing airworthiness organisations, despite the acknowledgement that MRO and engineering roles are critical and evidence of airlines and the sector investing in in-house maintenance capabilities[6,7].

B1/B2 licensed aircraft maintenance engineers and technicians are extremely sought-after. Lots of vacancies exist across airlines and MRO providers for these certified roles, which require years of training – hence the shortage.

MatchTech

Whist this survey focuses on Part-145 Organisations, it must be recognised the findings are understood to impact Part-CAMO, Part-CAO, Part-21 and Part-147 Organisations as well as those across the General Aviation sector.

What was once a forecasted skills shortage has now materialised into an existential threat to the UK aviation sector.

Aircraft maintenance forms a vital component of the Air Transport Sector valued at £160.8bn, contributing 4.5% of UK GDP[8], enabled by highly skilled maintenance personnel in safety-critical roles.

In early 2025, the RAeS and the CAA convened representatives from MROs, CAMOs and training organisations to review data on the ageing Part-66 licensed engineer workforce. This prompted reflection on the adequacy of current strategies.

The RAeS has produced this paper with input from the CAA, approved airworthiness organisations and other stakeholders to:

- Define the scale and nature of the problem.
- Highlight challenges reported by industry.
- Recommend actions to stabilise and rebuild the UK aviation maintenance workforce.

TODAY'S WORKFORCE AND ITS DEMOGRAPHIC

Data from the UK government, the CAA and industry survey respondents provide vital insight into the current workforce, the impact of international and national events and the outlook for UK PLC. The numerical evidence supports industry commentary that maintenance organisations are struggling to recover from the accelerated impact to skills and labour of Covid-19 and Brexit, where other roles in the sector have recovered or surpassed preceeding employment numbers in the same period as evidenced in Fig.1 and Fig.2 from UK Government Aviation Statistics[9]:

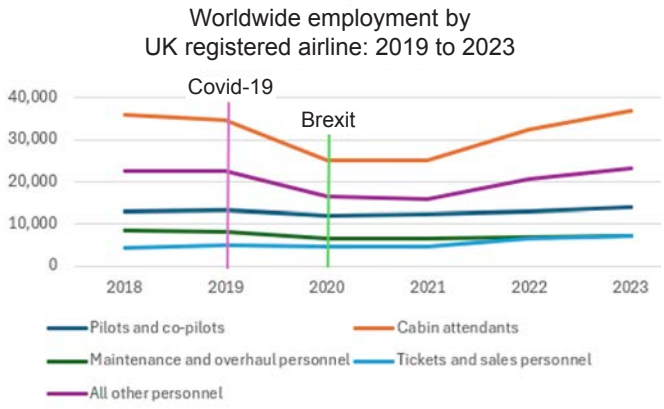

Figure 1

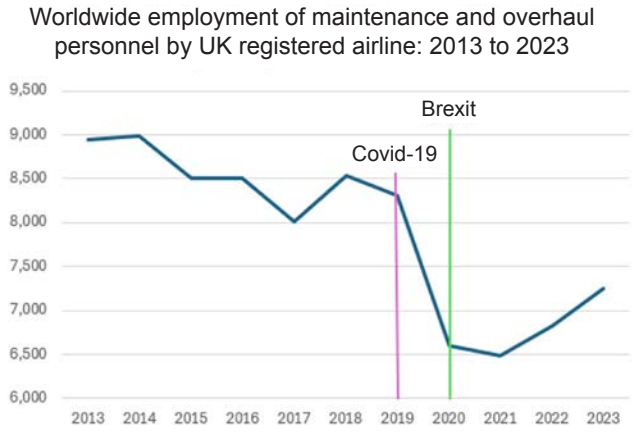

Figure 2

The shortage of engineers and declining experience levels are disrupting normal operations, creating risks to future growth and safety. Despite initiatives to address the skills and labour shortage, industry feedback shows these efforts have had little effect,

[5] House of Commons – *Environment, Transport and Regional Affairs* – 14th Report.
[6] Safran Landing Systems inaugurates a new engineering and support centre in Gloucester | Safran.
[7] easyJet to open a new aircraft maintenance hangar and apprenticeship training campus at London Luton Airport, supporting over 30 new jobs | easyJet.
[8] iata.org/en/iata-repository/publications/economic-reports/the-value-of-air-transport-to-united-kingdom/
[9] Aviation statistics: data tables (AVI) – GOV.UK

including increasing diversity of engineers, with only 2% of licensed engineers being female.

This skills gap affects the entire sector, not just one role or organisation. While this paper focuses on apprentices, mechanics and licensed engineers in Part-145 MROs, findings are similarly applicable to the wider talent pipeline with other critical roles facing similar shortages.

A further concern across the industry is the overall decline in experience within organisations, evidenced in Fig.3. Respondents noted reduced productivity and capability in certain specialised areas, including structural repair and maintenance planning. The survey evidences an ageing workforce but also a workforce with less experience. 30% of mechanics are under 30 years of age, increasing the likelihood of errors, lower productivity and less capacity to train future engineers and apprentices. The data supports that provided by the CAA in Fig.4, with the inclusion of unlicensed personnel.

This is not unique to the UK. Boeing highlighted this trend in its 2022, *Pilot & Technician Outlook*[10], describing it as a "juniority" issue where a disproportionate share of the workforce has lower experience than previous generations. An audience poll conducted during a panel discussion at MRO America 2025[11], saw 63% of responses report that more than 40% of their MRO workforce had five years' experience or less.

Data provided by the CAA (Fig.4) further defines the ageing workforce: 50% of engineers being >50 years old, and 22% >61 years of age. At the opposite end of the career cycle, only 4% are aged between 18-29 years of age.

The data details 'current' licences but does not identify if the holder is either in employment or in a role which exercises the licence privileges.

To hold a Part-66 licence, CAA regulations require theoretical knowledge, practical training and suitable experience, with variations based on the training

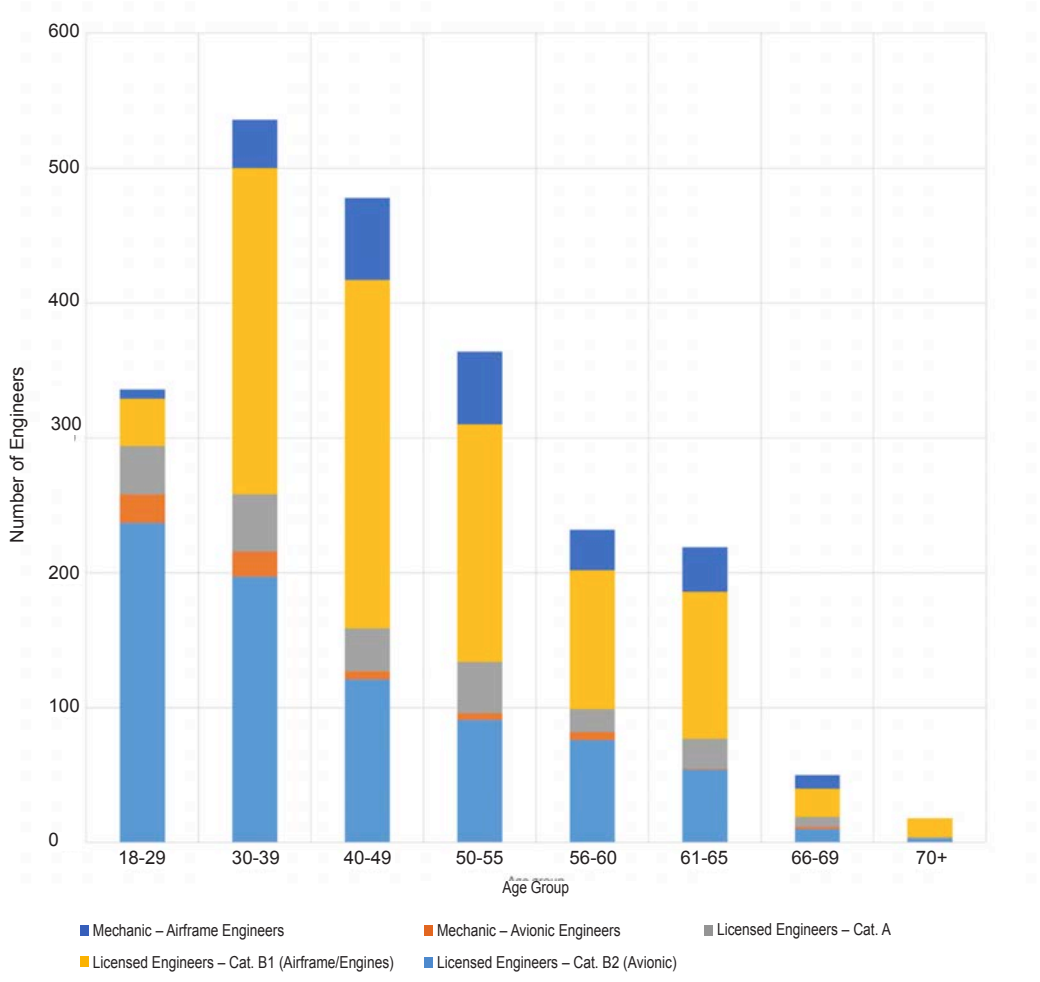

Figure 3

[10] Boeing's Latest Workforce Forecast Warns of MRO's Youth Problem | *Aviation Week Network*.
[11] Why Culture Could Be Key to Addressing MRO's Juniority Challenge | *Aviation Week Network*.

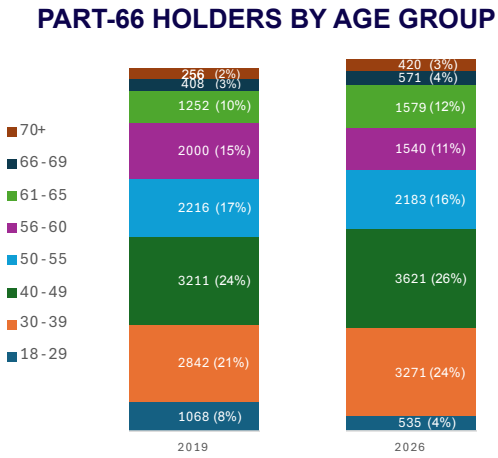

Figure 4

method, licence category and trade with a minimum age of 21. Typically, Cat. A licence holders have around 4 years' experience as mechanics, and Cat. B holders 6-8 years' experience as a Cat. A or mechanic, when granted their basic licence[12], without aircraft type[13].

Figure 4., provided by the UK CAA, indicates the number of licensed engineers under the age of 40 has remained stagnant between 2019 and 2026 and the number below 29 years of age has reduced by 49%. 53% of UK Part-66 Licensed Aerospace Engineers are not based in the UK. Further, it provides insight into the ageing workforce and the number who may have left the industry in this period.

IMPACT OF EU WITHDRAWAL AND COVID-19

The EU Withdrawal Agreement did not include a bilateral recognition arrangement for continuin airworthiness, specifically for aircraft maintenance. The CAA was not responsible for the agreement's provisions; its role is to regulate as directed. Transitional provisions, which expired in 2022, allowed eligible licences to be recognised by the CAA. Around 3,000 engineers converted EASA licences to UK CAA licences, many retaining both. This dual-licensing enabled certification under CAA and EASA approvals, but most engineers who used the EU-to-UK transition lost the right to work in the UK after Freedom of Movement ended. Some organisations now sponsor visas at costs of up to £5,000 per person for five years.

Post-transition, engineers applying for new or extended licences must do so under their National Aviation Authority (NAA). To hold unrestricted certification under both CAA and EASA, engineers must sit duplicate exams for each regulator, including type ratings. While ICAO Annex 1 allows recognition of other NAA authorisations under a company approval, engineers must meet certain conditions which limit flexibility, increase costs and time, and create complexity for overseas UK Part-145s supporting UK operators.

UK maintenance organisations continue to urge the Department for Transport to unilaterally recognise EASA Part-66 licences and Part 147 CoR for training received. UK/EU mutual acceptance should be pursued ahead of any unilateral acceptance. In June 2024, EASA amended Regulation (EU) 1321/2014, creating differences between UK and EU Part-66 syllabi. New engineers must now pass separate UK and EU exams. Although the CAA is amending UK Part-66, EASA licence holders will still need to complete all UK modules to obtain a UK licence.

COVID-19

Withdrawal from the EU and Covid-19 did not cause the skills and labour shortage. However, many organisations were forced to take measures to continue their operations during the pandemic, due to the reduction in aviation activity. These measures ranged from utilisation of the government's furlough scheme to redundancies, temporary lay-offs, and changes to employment terms and conditions.

> *Licensed technicians are tough to recruit – many left during Covid and are reluctant to return due to job security concerns. So MRO providers are offering incentives and fast-tracking apprentices.*
>
> MatchTech

During this period many highly experienced, skilled personnel also left the industry or retired creating a labour shortage (Fig.2).

Despite the disruption, the impact of Covid-19 on apprentices in training was largely mitigated by industry. Many apprentices whose training roles were affected were successfully redeployed to organisations less impacted by the crisis, or those near to completion were supported in doing so prior to changes in employment.

Data from an awarding body indicates that apprenticeship registrations have not yet returned to pre-pandemic levels. As of 2024, the number of new apprentice registrations remains 35% lower than in 2019.

INDUSTRY'S CURRENT WORKFORCE STRATEGIES ARE UNSUSTAINABLE

Those surveyed agreed that current strategies, such as reducing maintenance throughput to manage safety risks with pay increases, are short-term fixes.

[12] The Basic licence has no certification privileges until an aircraft 'type' is approved by the CAA.
[13] Engineers are granted approvals specific to an aircraft type or configuration, subject to additional training and assessment, eg Airbus A320 with CFM56 engine.

Without meaningful action there is a serious risk of declining safety standards and an increase in the likelihood of safety-related incidents.

Between 2019 and 2025, salaries for Category B1 and B2 licensed aircraft engineers have risen by approximately 66%, with some reported salaries now exceeding £100,000[14]. Higher wages have helped attract talent but have resulted in intense competition amongst employers. The general aviation sector cannot compete with the salaries that can be achieved if a Licensed Aerospace Engineer works for a larger airline or MRO. The resulting high staff turnover disrupts productivity and undermines business continuity. Respondents expressed concern that the pace of wage inflation poses a threat to the financial viability of their organisations and has limited ability to invest in future talent pipelines.

Several respondents reported discussions regarding potential sale or closure of maintenance businesses as being active and ongoing, citing the rising cost and limited availability of skilled personnel, while other organisations, ie airlines/operators, are buying independent maintenance organisations as a means of increasing their own capacity.

Salary data provided by an international aviation job website (Fig.5) gives an insight into average basic salaries across the UK accounting for variances in location and type of aircraft.

Overall employee benefit packages are playing an increasing role in staff retention and attraction, including training agreements, enhanced private healthcare, pension schemes or more flexible shift patterns. Biggin Hill Airport, for example, is building an accommodation block to allow personnel to work there without relocating.

Collaboration between the Society, industry, the CAA and the Ministry of Defence (MoD) has enabled a reduction in training timelines for personnel from military backgrounds, through recognition of military training and experience, which is showing early signs of short-term success in increasing the number of licensed engineers. The MoD has, however, shared concerns about losing personnel at a critical point in national security due to the civilian sector being able to offer higher salaries enabled via this pathway.

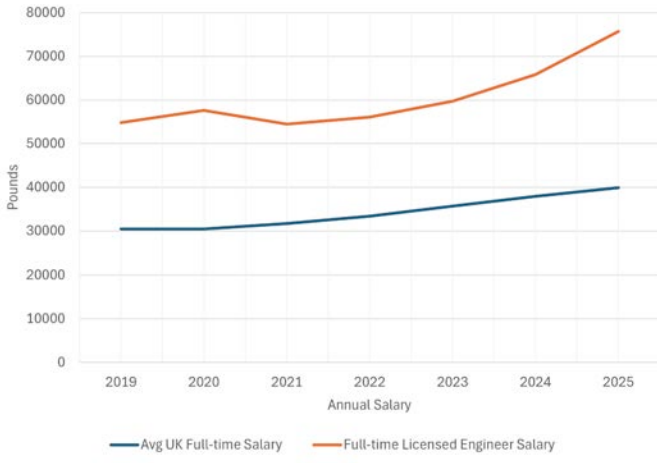

Figure 5

[14] Unite members celebrate landmark six-figure pay deal with American Airlines.

All contributors describe having multiple career development programmes for current and prospective employees', utilising a range of funding models (employer funded or sponsored, training bonds and/or apprenticeship levied).

RISK TO SAFETY

TRAINING STANDARDS

A report submitted to CHIRP[15] (the Confidential Human Factors Incident Reporting Programme) by a licensed engineer with more than 20 years of experience raised safety concerns about a decline in safety and professional standards within the industry. These concerns included inadequate or incomplete training, lack of practical experience among newly licensed engineers and inappropriate practices during the licensing process. In response, the CAA stated that the issues highlighted would be monitored as part of its regulatory oversight programme. The CHIRP team noted a broader trend of increasing responsibility for compliance being shifted from the regulator to Part-145 organisations.

Effective Safety Management Systems (SMS) depend on reporting with engineers and organisations capturing both the potential and actual occurrence of unsafe conditions or outcomes. This provides valuable evidence for interventions to maintain safety standards and on which to influence change to help address the skills and labour shortages.

HUMAN FACTORS

Human factors[16] associated with labour shortages, such as fatigue, stress and increased error, is recognised as a growing risk across the sector. Organisations are managing risk by utilising and prioritising available resource with a greater reliance on contracted personnel (who are similarly in increasingly short supply).

Biannual continuation training (eg Human Factors, Electrical Wiring Interconnection Systems (EWIS), Fuel Tank Safety) is now widely delivered using online and DSL (Distance Synchronous Learning – online). The CAA requires that HF training is specific to the organisation. However it is common for MROs to use generic eLearning courses, which remove the ability to share valuable organisational learning and experiences by face-to-face training.

Several organisations have recognised this and reverted to either in-person continuation training or using a blend of DSL and face-to-face. However, respondents highlighted ongoing concerns about an increase in Human Factors related incidents.

Considerations

- Increase face to face training for Human Factors initial and refresher training, recognising its increased effectiveness as a mitigation to the increased risk of related errors or occurrences.

ECONOMIC IMPACT

A shortage of qualified, experienced personnel limits the number of maintenance hours that can be delivered. This results in lost revenue for individual MROs and for the UK economy as work is increasingly outsourced overseas. The reduced revenue limits the sector's ability to reinvest in training apprentices, upskilling trainees, and developing experienced engineers exacerbating the skills shortage.

Over 55% of survey respondents reported regularly missing revenue opportunities due to insufficient availability of engineering personnel with combined estimated losses of approximately £79 million per year.

One major UK airline reported outsourcing approximately £58 million of aircraft maintenance annually overseas due to inadequate UK capacity. Another major UK carrier estimated a loss of £1.5-2 million annually due to delayed or cancelled flights and regulatory penalties stemming from staff shortages.

The ADS *Industry Facts & Figures* 2025 report[17] references economic financial benefits to industry.

WORKFORCE DEMAND FORECAST

Workforce planning typically spans 6 months to 3 years, but major airlines with expanding fleets or introducing new aircraft types, report planning up to 7 years ahead. This long-term view highlights future skills and training needs across the sector.

Respondents consistently identify the requirement to increase licensed engineers to deliver operational and growth strategies. The chart below provides a sample forecast demand across commercial and business aviation organisations (Fig.6) with the highest demand from airlines planning fleet growth.

The forecast demand chart (Fig. 7) is a 5-year outlook factoring in retirements, mechanics over 50 unlikely to

[15] ENG760 – CHIRP.
[16] The Human Factors 'Dirty Dozen' | SKYbrary Aviation Safety.
[17] Industry Facts & Figures – ADS Group.

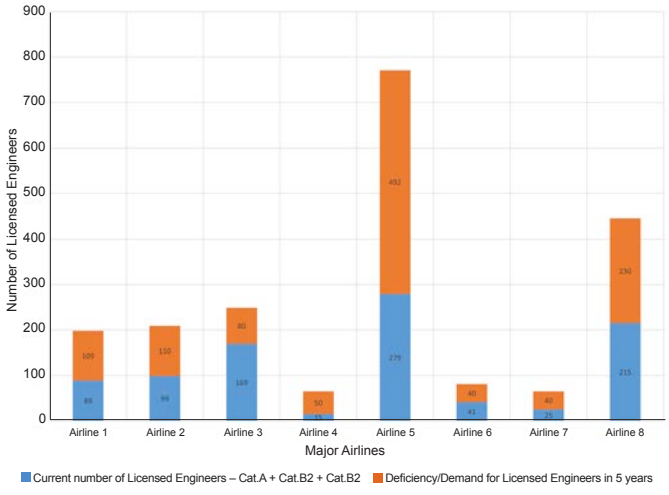

Figure 6

become licensed engineers, and an ideal progression of all mechanics under 50 to licensed status versus projected demand.

Noting survey responses represent only 38% of UK maintenance organisations and not all mechanics will become licensed, the projected shortfall of 558 licensed engineers is a conservative underestimate.

The average time taken to reach full competence as a Cat. B licensed engineer being 8 years, the current talent pool and pipeline is also insufficient to fulfil these roles.

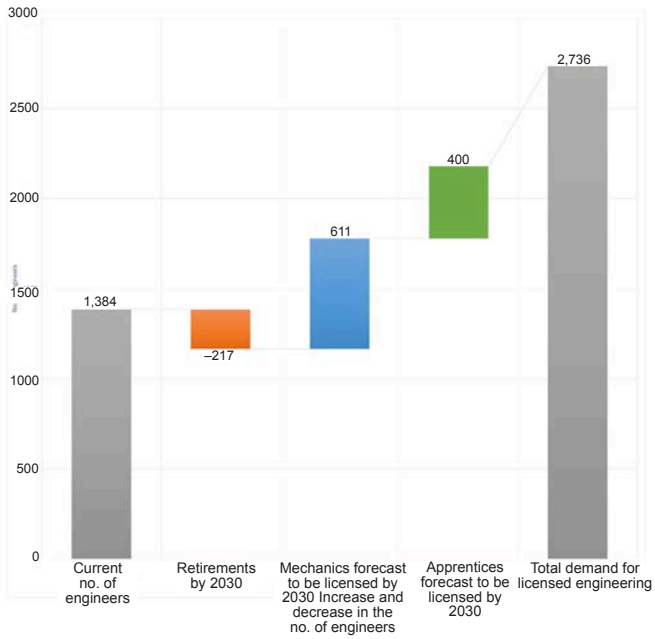

Figure 7

TRAINING PROVIDER CAPABILITY AND CAPACITY

UK aviation maintenance training capacity and capability is insufficient to meet current or future demand.

Programmes vary in quality and accessibility, limiting options for employers and learners. Training providers face similar challenges as MROs, with difficulty recruiting and retaining experienced instructors, high costs and regulatory constraints.

There are too few providers delivering the industry-standard training needed, both near aviation hubs and nationally. Barriers include high capital and operating costs, compliance requirements and the same skills shortage affecting instructor availability.

POST-16 EDUCATION PIPELINE

Applicants with FE (including T-Levels) or HE aviation qualifications often face barriers in progressing post-completion of aviation courses. Despite appearing beneficial, these qualifications can hinder entry into structured training roles, like apprenticeships.

Many courses fail to provide the practical, regulatory and workplace-ready skills MROs require. Candidates are frequently seen as 'overqualified' due to Recognition of Prior Learning (RPL)[18,19], which reduces government funding for the individual learner regardless of the training provider and/or employer considering that further training is necessary to meet the required standard. Recent changes made by the trailblazer reduce the impact of RPL, but only in about half of cases. One organisation reported two apprentices had withdrawn from aviation courses at their local college; after learning it could harm their apprenticeship prospects.

Industry agrees the current FE and HE model is unintentionally harming prospective applicants' likelihood of achieving certain career pathways. An improvement in either the programmes delivered or careers advice is essential to reduce the likelihood and impact of this. Despite repeated concerns raised at conferences and roundtables, reform has been slow.

Considerations

- Industry-approved standard for aviation training delivered on full-time or part-time education courses, providing reassurance for learners and confidence within industry.
- Training providers to review course syllabi to remove or limit duplication which may impact RPL.

[18] Recognition of Prior Learning (RPL) requires training providers to reduce claimable funding where a learner has previously achieved the same learning; the requirement is considered inflexible – no consideration may be given to quality or effectiveness of that learning.
[19] Apprenticeships: initial assessment to recognise prior learning – GOV.UK

TRAINING AND FUNDING

In the past 18 months, two respected [level 3 or equivalent] independent training providers[20,21], together representing more than 190 years of combined experience, have stopped operating. A third is feared to be at risk due to local authority funding constraints and a fourth independent provider is reporting unsustainable financial performance, causing further concerns over the shrinking capacity of the UK's aviation training infrastructure for maintenance mechanics, technicians, and licensed engineers.

The Apprenticeship Levy was introduced in 2017 to fund training provision[22], but contributors report that the funding bands have not been subject to increases in line with inflation, with only 1 minor increase having been applied. Training providers report the cost for delivery of the Aircraft Maintenance Technician Level 3 standard as being £36,000, with the assessed funding band of £27,000 being allocated. If inflation is applied to this funding band from 2017, the value of the band is circa £35-36,000.

Training providers respond to this funding shortfall by:

1. Running the apprenticeship at a loss
2. Charging the employer the additional cost
3. Reducing costs associated with delivery
4. Shortening the duration of the apprenticeship to recognise the revenue over a shorter period

Response 2 is commonly rejected by employers, who report they have made the investment through levy contributions and are either unable or unprepared to supplement it further due to frustrations with the funding rules. Response 3 and 4 result in a reduction in the quality of training.

Make UK reported a 42% drop in engineering and manufacturing apprenticeships since 2016-17, stating that "much of this decline is accounted for by steep falls in the number of apprenticeships at Level 2 and 3, which have been routinely underfunded"[23].

Part-147 organisations involved in aircraft type training identified similar challenges in funding where remote training unlocked a global market for overseas approved organisations with lower operating costs than UK-based operations driving down prices.

UK providers highlighted that a Type Course previously priced at approximately £12,000 per person pre-Covid, must now be offered at around £3,500 to remain competitive, impacting their commercial viability.

Considerations

- Aviation apprenticeship funding bands increased to reflect inflation and the real cost of high-quality, safety-critical training addressing the reported £9,000 per learner shortfall, due to the critical shortage of engineers.
- Employers support training providers with additional investment funding per learner or cohort.
- MROs should evaluate the benefits of high-quality, in-person Type Training in the UK and be prepared to pay a rate that reflects its true cost and value.
- The CAA should evaluate the use cases and effectiveness of DSL, including proficiency of instructors and resources in its use.

TRAINING PROVISIONS AND DELIVERY REQUIREMENTS

Respondents provided similar feedback relating to provisions of Further Education (FE) and Higher Education (HE) which do not meet the standard of training outcomes they require.

While some colleges are viewed positively, the general sentiment is that FE institutions lack the technical insight, instructional capability and ability to adapt and deliver both academic and practical skills to the industry standard. Contributors shared that they have made attempts to support local education provisions but their feedback was not acted upon and the results continue to be below the standard they require. Without an alternative viable provision, some have accepted the substandard provision, with a number reporting stopping apprenticeships altogether.

Further examples by contributors include using their own instructors or hiring external contractors to supplement the provision of their FE college apprenticeship training provider. Other employers described having to utilise a sub-optimal programme which has apprentices going directly onto the shop floor from day one of employment, with day release twice per week (non-consecutive days) which has introduced risk and reduced productivity, requiring additional controls to mitigate the impact by the employer.

Contributors shared that their FE provider had received an 'outstanding' or 'good' grading from Ofsted for their apprenticeship provision but shared that they would describe their experience and that of their apprentices as being unsatisfactory, suggesting Ofsted is an unreliable indicator of the quality of training needed for this provision.

[20] Cambridge aerospace company, Marshall may slash 300 jobs – BBC News.
[21] Perth's air service training enters administration amid financial struggles – Scottish Business News.
[22] https://www.gov.uk/guidance/pay-apprenticeship-levy
[23] The Skills Needed to Support an Industrial Strategy | Make UK.


HOUCHIN

It is recognised universities deliver strong academic outcomes, but graduates lack the practical skills employers need. This mismatch requires employers to provide extra unfunded training which is something many are unable to provide. Graduates are often left overqualified yet underskilled for available roles or training pathways.

Concerns around training quality also extends to Part-147 provisions, including short programme durations and mixed effectiveness of delivery methods, resulting in insufficient basic hand skills and low 'first time pass' rates for knowledge examinations.

Additional constraints include access to aircraft, which hamper the ability of independent Part-147 providers to complete the practical training element. While some Part-145 organisations do offer access where possible, it remains inconsistent. Practical training is often not feasible due to aircraft availability, tight maintenance schedules and the operational risk of training during active maintenance.

Consequently, many tasks are delivered as simulations, with little to no physical tasks taking place.

The UK CAA has increased its audit activity, having identified this through a risk-based oversight process.

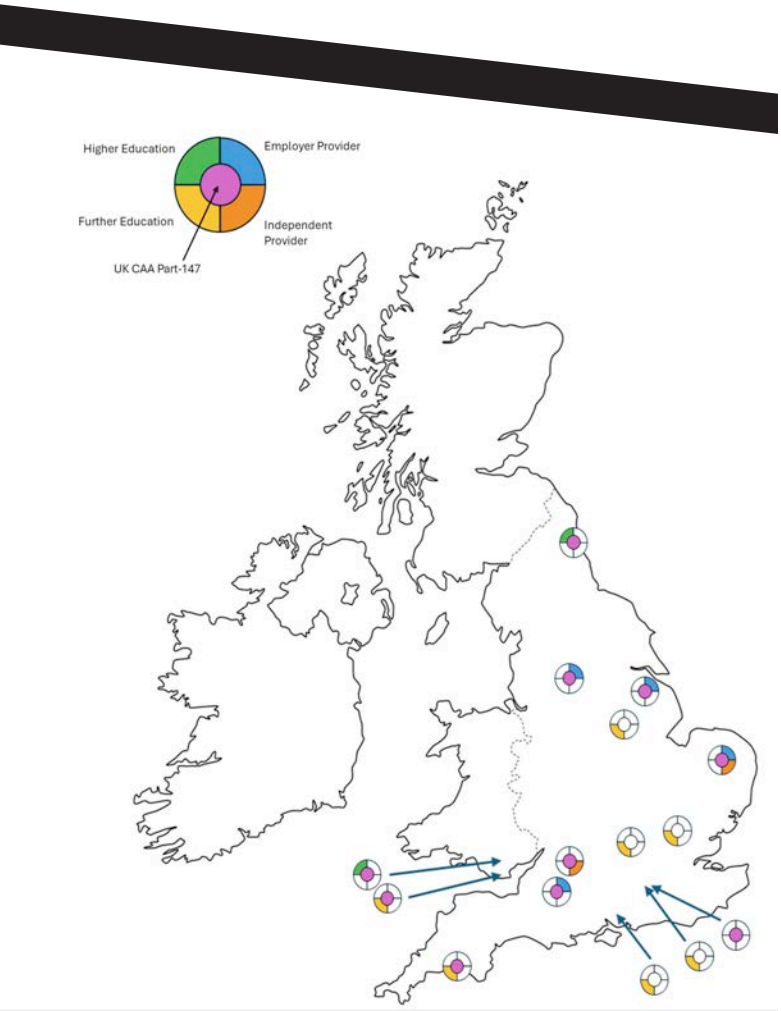

Figure 8

Considerations

- Implement a national aviation training quality framework to assess and benchmark FE and HE provisions of both full-time courses and apprenticeships, enabling employers to make informed choices and supporting underperforming colleges to improve.
- Encourage universities to embed practical, industry-aligned training and licence module content into engineering degree programmes, co-designed with employers to improve graduate job readiness.
- Establish targeted funding or co-investment schemes to support post-degree practical upskilling, enabling employers to bridge the competence gap without bearing the full training cost.

GEOGRAPHICAL LOCATION OF TRAINING PROVIDERS

Industry does not have access to training providers with the required capability in geographically beneficial locations, as illustrated in Fig.8.

Major airport hubs do not have local training provisions that deliver the required outcomes, with employers either accepting the substandard provision or electing not to use local colleges. Contributors report using training providers over 130 miles from their maintenance organisations, resulting in further cost and complexity, with one employer reporting costs, of around £800,000 per year for this provision.

Considerations

- Invest in building and accrediting high-quality regional aviation training hubs, especially in areas with existing employer demand, to reduce reliance on long-distance travel and associated costs.

- Provide dedicated government or industry-matched capital grants to help FE, HE and Part-147 training providers invest in facilities, equipment and materials. Funding should prioritise those targeting underserved regions or demographics and support costs required for regulatory approvals.
- Increase regulator examination centres to support training providers without Part-147 approvals.

TRAINING ORGANISATIONS AND SKILLS SHORTAGES

Training providers across the sector, including Part-147 training organisations, FE colleges and HE institutions, consistently report experiencing labour shortages among instructors, leading to poor learner experience[24].

The typical person specification for an instructor includes individuals with strong technical competencies, such as experienced mechanics, sheet metal specialists or licensed engineers and are the same skills required amongst maintenance organisations. Salaries for instructors vary significantly depending on the training type and institution (Fig.9) and fell short of the earning potential industry offers a licensed engineer who can earn between £80,000-£100,000.

Type training instructors command the highest salaries in the sector. Since 2019, salaries for these roles have risen by approximately 60%, aligning with those offered in operational Part-145 organisations. Instructor salaries in this category can be in the upper range between £85,000-£90,000, an increase from the previous range of £55,000-£65,000 (2019).

Basic training instructors (eg those delivering Part-66 licence modules) in independent Part-147 providers typically earn between £50,000-£60,000. While this is roughly equivalent to the salary of an industry mechanic, it remains significantly lower than the earnings of licensed engineers.

FE college instructors face the most acute challenges. Salaries in these institutions typically range between £38,000-£46,000, making it difficult to attract and retain staff. Many instructors can earn up to £15,000 more as mechanics or over £40,000 more as licensed engineers in industry roles.

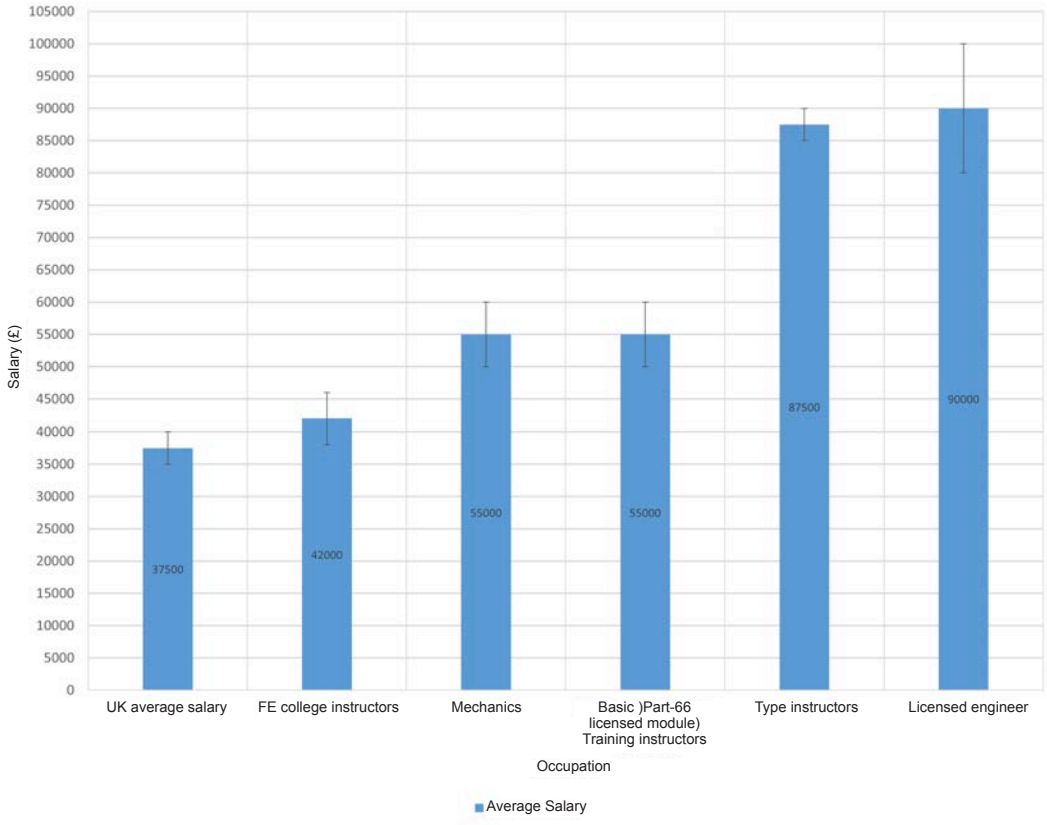

Figure 9

[24] Teacher workforce: secondary and further education – NAO report.

Considerations

- Targeted funding mechanisms to help training providers cover the higher costs associated with technical instruction.
- Industry collaboration, where employers support delivery through secondments or shared staffing models.
- Sector-wide campaign to re-engage highly experienced engineers and technicians, particularly those nearing retirement or leaving operational roles into teaching positions.

BARRIERS TO ENTRY FOR TRAINING PROVIDERS

Establishing or expanding training provision (FE, HE and Part-147) requires significant capital investment with training materials, resources and equipment, and regulatory approval. The high financial entry point has contributed to the limited number of approved providers.

Training providers require commitment from industry in terms of duration and student numbers to develop training programmes which are commercially viable, with support from employers through the initial phases of delivery.

For Part-147 training organisations, access to Part-145s to carry out practical training in a live maintenance environment requires close collaboration with industry partners, for whom the provision of access must be done without negatively impacting safety or efficiency of the maintenance operation.

The CAA has also noted there is an increasing shortage of suitably qualified, experienced personnel to act as Nominated Persons which may present a constraint in increasing the number of Approved Training Organisations in the UK.

Considerations

- Set-up Grants for New Training Providers to support those aiming to enter or grow their provision in the aviation training market, particularly those offering Part-147-aligned or equivalent training.
- Develop a national initiative to identify, train and mentor experienced engineers into Nominated Persons roles. This should include CPD programmes, financial support for training and a shared talent pool accessible by new and expanding Approved Training Organisations (ATOs), addressing the regulatory bottleneck limiting growth.

INDUSTRY OPPORTUNITIES IN THE PIPELINE

Industry engagement and careers advice with young people often happens too late, blurring the line between early careers outreach and recruitment.

Over 80% of survey respondents host or attend careers events. However no mechanism exists to measure effective conversion of engagement into a strong talent pipeline. OECD[25] research shows children form career assumptions as early as primary school, with little change between ages 7 and 17. Influencing decisions requires multiple, meaningful engagements.

The UK has many initiatives led by charities, companies and government, but the landscape is fragmented, with inconsistent goals, messages and reach. For example, the government's Reach for the Sky programme engaged 100,000 young people, and a major airline reached 71,000 through 266 events in 2024. Combined, these efforts reach just 1.9% of the 9 million students in UK education[26], highlighting the scale of the challenge and the weak link between effort and outcomes.

Contributors to this paper consistently report being oversubscribed for entry-level roles. One major defence contractor received over 30,000 applications for 1,200 vacancies. Employers do, however, describe a reduction in the number of suitable applicants, with differing issues being apparent during initial application filters through to interviews.

While employers were unable to quantify this precisely, there is a widely observed decline in candidates demonstrating the desirable hand skills and mechanical aptitude. This has been attributed to reductions in technical and practical education within the secondary school curriculum and societal changes compared to previous generations[27]. Engagement needs to pivot to support development of the skills absent from the education system or society.

Smaller organisations report growing difficulty in finding suitable candidates with the right fundamental skills with proportionately less applicants.

Applicants who had been members of youth organisations, particularly the RAF Air Cadets or who have participated in structured personal development programmes, like the Duke of Edinburgh Award, are consistently highlighted as strong performers in the recruitment process.

Many initiatives target disadvantaged or under-represented groups but are often short-term and transactional, failing to address systemic barriers. Effective outreach must start earlier and be sustained. It should combine digital and in-person engagement to maximise impact, built on a deep understanding of the target audience's environment. Without this, the sector risks losing diverse, high-potential talent.

[25] OECD says employers need to tackle 'ingrained assumptions' about jobs – Education and Employers.
[26] Schools, pupils and their characteristics, Academic year 2024/25 – Explore education statistics – GOV.UK.
[27] UK STEM skills pipeline.

Considerations

- Align coordinated activities, resources, funding and careers advice across industry, training providers, charities and the education sector to improve quality, frequency and consistency from primary school age onwards. The strategy must also distinguish between outreach and recruitment objectives to account for differing organisational approaches. The RAeS Aero Charities Symposium in 2025 is a model example to follow.
- Outreach should shift from number of engagements to quality of engagements with a focus on developing skills identified as lacking, ie basic engineering hand skills.
- Outreach engagements must become more efficient, effective and coordinated with multiple organisations. Develop a shared resource bank of outreach engagement tools to help organisations participate in early careers activity and promote the breadth of roles across the sector collectively.
- Industry and education establishments to track and support individuals from STEM engagement, through technical education and follow unsuccessful applicants for future reapplications.

PARENTAL AND YOUNG PERSON'S PERCEPTIONS

Many parents have a narrow view of aviation, often seeing pilots, cabin crew or engineering as the only careers in aviation. This limited understanding can lead to discouraging advice, especially if they believe aviation careers are financially risky, exclusive, only for top academic performers or conversely as unskilled[28].

Young people's perceptions shape interest and career choices. Many see aviation as inaccessible, overly technical, environmentally harmful or lacking creativity. There is little visibility of the diverse roles available, and social media rarely portrays aviation as dynamic, inclusive, or socially valuable, limiting its appeal.

Overcoming this includes equipping schools with accurate resources, supporting parents with guidance, and offering engaging, hands-on experiences that reflect the full range of aviation careers.

Currently, there is no formal system to track engagement success, follow up with unsuccessful applicants, or offer alternative pathways, leaving gaps in support and conversion from engagement to career.

APPRENTICESHIP PATHWAYS

Apprenticeships remain the most common and effective entry point for those seeking careers in the industry, while also serving as an important mechanism for employers to fund and sustain talent pipelines.

Industry has three aircraft maintenance apprenticeship pathways:

1. Level 2 (L2) Maintenance Mechanic
2. Level 3 Aircraft Maintenance Technician, aligned to UK CAA Category A
3. Level 4 (L4) Aircraft Certifying Technician, aligned to UK CAA Category B (not commonly used and under review)

Pathways 1 and 3 have experienced limited uptake to date, either due to being newly approved (L2 Maintenance Mechanic) or being found to have constraints to delivery and is currently under review to address them (L4 Aircraft Certifying Technician).

The level 2 was designed by industry to address accessibility issues by those who had the mechanical aptitude but were unable to achieve the academic requirements and outcomes of the Level 3 standard, thus providing a more suitable entry point with clear progression pathways.

INDUSTRY CAPACITY TO INCREASE NEW TRAINING VACANCIES

27% of survey respondents currently offer Level 3 apprenticeship programmes, including the Aircraft Maintenance Technician[29] which supersedes the previous standard. These programmes typically last between two to four years, are delivered at an academic level 3 or UK CAA Part-66 Cat A and are funded through the Apprenticeship Levy.

50% of survey respondents reported having capacity to train additional apprentices but are unable to do so due to financial limitations. Unlocking this potential could significantly expand the number of training opportunities available across the sector.

Apprentices pay remains below the National Living Wage[30], further reducing the attractiveness of these roles (particularly among older candidates) and making it more difficult for employers to recruit high-calibre candidates.

[28] RAeS_perceptions_of_aerospace_and_aviation_careers_-_oct_2017.pdf
[29] Aircraft maintenance technician / Skills England.
[30] Employing an apprentice: Pay and conditions for apprentices – GOV.UK.

73% of respondents indicated that if funding barriers were addressed, they would consider offering more apprenticeships than currently planned.

To support this growth, training organisations must be given clarity on student volumes and training pathways. This will allow them to build robust investment cases, understand resourcing requirements and address logistical and staffing constraints while maintaining quality training.

In addition to funding, many employers especially SMEs, struggle to provide the structured and supportive learning environments needed for running effective apprenticeship programmes. Smaller companies often feel disadvantaged by training providers who prioritise larger organisations and report difficulties in attracting suitable candidates due to low awareness, low application volumes and high trainee costs. For these businesses, the upfront investment in training is often a significant challenge.

Considerations

- Create training opportunities which exceed the requirement of a single employer to support wider industry.
- Develop coordinated workforce development pathways in collaboration with SMEs and supply chains.
- Create formalised partnerships between FE/HE providers and Part-145 organisations, supported by incentives (eg funding offsets, recognition schemes, or ESG credits) for MROs who host apprentices or trainees.

Conclusion: Coordinated Action

The UK aviation maintenance sector and government have long known about the looming skills shortage, yet actions so far have been insufficient. The result is a worsening shortfall in skilled labour and training capacity. If stakeholders continue with a fragmented approach, businesses risk closure, or increase in maintenance being carried out overseas, either from inability to operate or competitive disadvantage.

Actions post-the 1999 RAeS paper[31] have been ineffective; industry, education, government and charity must stop doing the same thing, expecting different outcomes.

Current initiatives are numerous but largely uncoordinated. There is huge potential in aligning messaging, resources and funding across industry, government, education and charities to drive systemic change.

Schools, colleges and universities remain underused in tackling the skills gap. Greater collaboration with industry is needed to align curricula with real-world practical needs.

Training costs for aircraft maintenance engineers are prohibitively high under the current apprenticeship levy model. A new blended funding approach is essential to meet the cost of delivering high-standard training.

Investing in skills now will pay off within a decade, boosting high-value employment, slowing wage inflation, expanding domestic training capacity, reducing overseas maintenance spend and driving sector growth.

[31] https://www.aerosociety.com/media/28904/raes-aircraft-maintenance-engineering-challenge-for-the-future-1999.pdf


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Key Recommendations

1. Develop a National Sector Skills Strategy

Establish a cross-industry government strategy to coordinate outreach and careers advice, including high-value, accessible and progressive training pathways from early education through to career entry, drawing on the RAeS Charity Symposium as a model for collaboration.

2. Create a Network of Regional Training Hubs

Launch centrally managed, regional training hubs at key UK locations, operated by selected colleges and universities to agreed standards, supported by the entire sector and its representative bodies.

3. Reframe Training as an Investment

Review and consolidate existing funding mechanisms, including but not limited to government apprenticeship levy, with charity and corporate sponsorship funding to be refocused to maximise impact nationwide, supporting national economic growth and highly skilled job creation.

4. Expand Apprenticeship and Training Vacancies

Government to establish a national target for new aviation apprenticeships guided by industry and key training providers. Industry to support training providers in establishing more effective provisions.

5. Recognise Skills and Labour Shortage as a National Strategic Priority

Government and employers to include workforce skills and experience levels in their Safety Management Systems (SMS) and risk registers.

6. Recognition of EASA Licenses

Government to work towards mutual or unilateral acceptance of EASA Part-66 licenses or EASA part-147 CoR for training received.


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