

Response to the Technical and Professional Education Reforms on behalf of the Aerospace, Maintenance Repair and Overhaul/Airworthiness and Maritime Defence Apprenticeship Trailblazer Groups.

The following response is on behalf of the Aerospace, Maintenance Repair and Overhaul/Airworthiness and Maritime Defence Apprenticeship Trailblazer Groups. In total these Trailblazer Groups have developed 19 new Apprenticeship Standards and Assessment Plans ranging from Level 2 to Honours Degree Level. The groups are made up from employers large and small, together with Awarding Organisations, Professional Engineering Institutions and organisations such as GTA England and the National Forum of Engineering Centres. Central to our Standards development is the inclusion of mandatory qualifications at a “foundation phase”, and “development phase” culminating in an end point assessment. The mandatory qualifications focus on technical knowledge and vocational competence, formal gateway reviews are built in to the journey to enable apprentices to demonstrate the required competency and progress to the next stage. In each Standard, key Knowledge, Skills and required Behaviours are outlined; the end point assessment comprises of both a professional competence judgement, which is independently assessed by Professional Engineering Institutions aligned to UKSPEC, and with an occupational competence judgement, ultimately made by the employer.

1: What are your views about the emerging design principles?

We believe it is imperative that employers are involved in the process, and also those organisations that genuinely link with smaller employers such as GTA England and NFEC, recognising that smaller employers may not have the time or resource to full support the challenge. Importantly the involvement must be sector wide.

2: What core skills do employers want young people to learn in full-time education? How should these be assessed? Is there a role for employers in assessing skills?

We don't want to re-invent the wheel here, employers know what they want. We are designing the Apprenticeships for the future, raising the standard of an Apprenticeship Framework to fully to meet employer needs, included in our new Apprenticeship Standards are a common set of behaviours, such as having a strong work ethic, being motivated, dependable, reliable and punctual, maintaining a positive attitude, being a team player, adaptable, honest and a self-starter. As a group we have defined these types of behaviours in our Standards required for working life, we therefore would see that many of these soft skills be developed pre-apprenticeship along with English, Maths and IT. There is value in developing and assessing these skills in an occupational setting and employers should have a role in designing that assessment.

3: Do you agree that it is only possible to become fully “work ready” by following a period of meaningful work experience or will classroom training alone be sufficient preparation for work in some occupations?

For us as a sector, we would say both work experience and classroom training is the perfect blend when preparing someone for work. The timing of the work experience is crucial, the duration and level of exposure to the types of tasks required in industry will all play a part in supporting an individual to be “work ready”. Behind the Apprenticeship there is a fundamental principle of having a programme which involves direct experience of work and in our opinion best delivered through an Apprenticeship Standard.

4: How do we succeed in getting more employers to offer work experience and what is the best way of involving employers in the assessment of employability skills?

In order to attract employers to become more involved in work experience placements there needs to be real value to the employer. Through our Trailblazer activities employers have come forward to develop the right skill sets required for each occupation, this is because our groups are committed to developing Standards that are fit for purpose and meet employer requirements. We would suggest building on the Trailblazer groups to ascertain which are the crucial employability skills required. If work experience and employability skills are joined up to new Apprenticeship Standards there will naturally be a pathway of credible work experience that compliments the Standards, this will help to create a pipeline of talent for individuals to experience what it is like in the world of work and for the employer to meet with potential future applicants. The best way to assess employability skills would be in an occupational setting and ensuring that the curriculum is vocationally appropriate.

Most of the employers in the group will deliver 14-16 year old and less extent 16-18 year old work experience as a pipeline for their Apprenticeships and Higher Apprenticeship programmes. Some of us are also supporting the Movement to Work programme which provides young people aged 18-24 with work experience, again designed ideally to lead to an Apprenticeship.

5: What role should employers play in the governance of this system, specifically in identifying new routes or adapting existing routes to respond to emerging economies and technologies?

Employers should play a role in governance of the system, having input to what should be covered, but care needs to be taken here to not to detract from an employer's day job, therefore the process should be easy to access and not time consuming/overly bureaucratic. Employers are committed to ensuring the right type of impartial advice and guidance is available for people to make an informed decision about an Apprenticeship, this needs to be given clear focus.

(Please see below for a sample Apprenticeship Standard which we have developed)

A sample Standard:

Apprenticeship Standard for: Aircraft Maintenance Fitter/Technician (Fixed and Rotary Wing)

The following Standard reflects employers' requirements for the skills, knowledge and behaviours required to be competent in the job role.

Role Profile

Aircraft Maintenance Fitters/Technicians work on maintaining aircraft of all types from small aeroplanes to airliners, jet fighters and helicopters, both civil and military. They are expected to carry out approved maintenance processes to maintain the airworthiness of the aircraft. It involves highly skilled, complex and specialist work, maintaining aircraft systems according to approved requirements and work instructions, using relevant hand tools and equipment. They must comply with civil and or military regulatory and organisational requirements. They must be able to research data sources, ensuring that on completion of a task all aircraft documentation is accurately filled in. They will be expected to work both individually and as part of a larger maintenance team. They will demonstrate their ability to identify and resolve problems using the appropriate processes and understand the limits of their authority/approval. They will understand how and why Standard Operating Procedures are produced for maintaining aircraft and the importance of using them.

Role Requirements (knowledge and skills)

There are different civil and or military requirements which need a range of options depending upon the employer context.

Core

1. Use of mathematical techniques, algebraic expressions, formulae, calculation and physics to understand the theory of flight, aerodynamics and aviation maintenance processes
2. Understand the structure, properties and characteristics of materials used in the construction, maintenance and repair of aircraft components, whole structures and sub-assemblies
3. Understand the fundamentals of electrical, electronic, digital, analogue, aircraft systems and maintenance practices
4. Reading and interpreting engineering data; drawings, specifications, maintenance manuals, computer generated information and aircraft documentation
5. Safe selection and use of hand and mechanical tools and equipment while carrying out maintenance of aircraft
6. Appropriate bonding and assembly techniques e.g. in composite assembly
7. Complying with statutory, quality and organisational requirements for aviation safety and occupational health and safety while carrying out aircraft maintenance techniques
8. Human Factors in aviation – developing an understanding of attitudes and behaviours to ensure aviation safety
9. Use of measuring and or test equipment both mechanical and electronic while carrying out aircraft maintenance activities
10. Aircraft functional checks and fault diagnosis e.g. electrical bonding and earthing; flight control rigging
11. Use of ground support equipment

Employer Selected Options (minimum of 2 options)

1. Identification, control, repair and prevention of damage, fatigue and corrosion
2. Power-plant (piston & turbine engines), propellers & rotors
3. Business improvement techniques (personal accountability requirements) for working in an airworthiness environment (Maintenance practices)
4. Measuring and marking out materials to carry out precision repairs to aircraft
5. Precision drilling and finishing of holes in aircraft assemblies
6. Identifying and installing mechanical fasteners
7. Sealing and jointing techniques: use of seals, gaskets and jointing techniques
8. Assembly, repair and replacement of pipe work for aircraft and engine systems
9. Inspect, repair, remove and replace aircraft structures, components, sub-assemblies and systems
10. Aircraft flight-line handling and operations

Note: Several options are available through the Apprenticeship depending on the context of the employer's business, whether in civil or military aviation, rotary or fixed wing aircraft, in workshop, line or base maintenance. All routes have core knowledge requirements but practical skills options are likely to differ but are of comparable weighting. Apprentices undertaking the EASA Aircraft Maintenance Licence Category A pathway will be required to pass the knowledge elements at 75%. Full details of the requirements including core and options, minimum requirements and rules of combination are contained in the **Assessment Plan** and Employer **Occupational Brief (EOB)**. The EOB will inform the awarding organisations of the required elements of both knowledge and vocational skills within this Apprenticeship Standard. It will also provide a clear basis for the development of the assessment of this Apprenticeship and will enable the sector to maintain world class levels of quality and ensure that the credibility and consistency of Apprenticeship outcome is maintained.

Employee Behaviours

Modern maintenance organisations require their apprentices to have a set of behaviours that will ensure success both in their role and in the overall company objectives. The required behaviours are:

1. Strong work ethic: motivated, proactive, committed
2. Dependability and responsibility: punctual, reliable
3. Positive attitude: constructive thinking, motivated to succeed, committed to equality and diversity, environmental, social and economic sustainability
4. Team player: able to work and interact effectively within a team
5. Effective communication: spoken, listening, body language, presentation, written
6. Adaptability: able to adjust to change
7. Honesty and integrity: truthful, sincere and ethical
8. Self-motivation: self-starter, able to make appropriate decisions and lead their own professional development
9. Personal commitment: prepared to make a personal commitment to the industry

Entry Requirements

Individual employers will set the selection criteria for their Apprenticeship. In order to optimise success, candidates will typically possess four GCSEs C grade (or equivalent) or above on entry including English, Maths and a Science. Apprentices without Level 2 Maths and English need to achieve this prior to completion of their Apprenticeship.

Duration of Apprenticeship

Typically 36 months, this may reduce for apprentices who possess relevant qualifications or experience

Qualifications/Certification and Development

After a period of foundation skills and technical knowledge development all apprentices will be required to achieve the following qualification (working titles - currently in development)

- Level 2 Aerospace and Aviation (Foundation Competence)

After a further period of skills and technical knowledge development all apprentices will be required to achieve the following (working titles - currently in development)

- Level 3 Aerospace and Aviation (Development Competence)
Plus **one** of the following Technical knowledge Qualifications
- Level 3 Diploma in Aircraft Maintenance (Civil Aircraft Mechanical)
- Level 3 Diploma in Aircraft Maintenance (Military Aircraft Weapons Maintenance)
- Level 3 Diploma in Aircraft Maintenance (Military Aircraft Mechanical)
- Level 3 Diploma in Aircraft Maintenance (Military Aircraft Electrical and Avionics)
- EASA Aircraft Maintenance Licence Category A Part 66 modules.

All of the qualification/certification requirements in the foundation and development phases are mandatory outcomes for the completion and final certification of the Apprenticeship Standard. Each qualification has a core and options approach and employers will select the most applicable pathway and unit options to meet their business requirements. Further detail can be found in the Employer Occupational Brief which is an annex to the Assessment Plan.

There will be an assessment at the end of the development phase where the apprentice will need to demonstrate full competence against the qualification/certification outcomes for knowledge, skills and behaviours, set out in the Standard and Employer Occupational Brief. On successful completion of the employer endorsement phase (sign off) apprentices will be then be put forward to be awarded their Apprenticeship completion certificate.

Professional Recognition

Completion of the Apprenticeship is designed to be recognised by relevant Professional Engineering Institutions at the appropriate level of professional registration (EngTech).

Level and Review

This Apprenticeship Standard is at Level 3 (equivalent to A levels) and will be reviewed after three years to ensure it continues to meet employers' requirements and provides the basis for progression to higher qualifications and/or job roles.