

End Point Assessment Plan

Aerospace Manufacturing Electrical/Mechanical and Systems Fitter Standard

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Note. Apart from Annex 4, 5 and 8 the other Annexes are currently in development. Once complete this Assessment Plan will be re issued along with supporting Annexes including URL links and made available to all relevant apprentices and stakeholders. For interim information, advice and guidance relating to the documentation in development and access to Annexes 5 and 8 please contact Customer.Services@semta.org.uk quoting Trailblazer Assessment Plan documentation.

Foreword

The Aerospace Manufacturing Electrical/Mechanical and Systems Fitter assessment plan is delivered within the three phases of the Apprenticeship standard, these being the:

- *Foundation Phase*
- *Development Phase*
- *End Point Assessment & Employer Endorsement Phase*

Taken together the assessment approach we detail here is fundamentally different and represents a significant improvement on current assessment systems, namely:

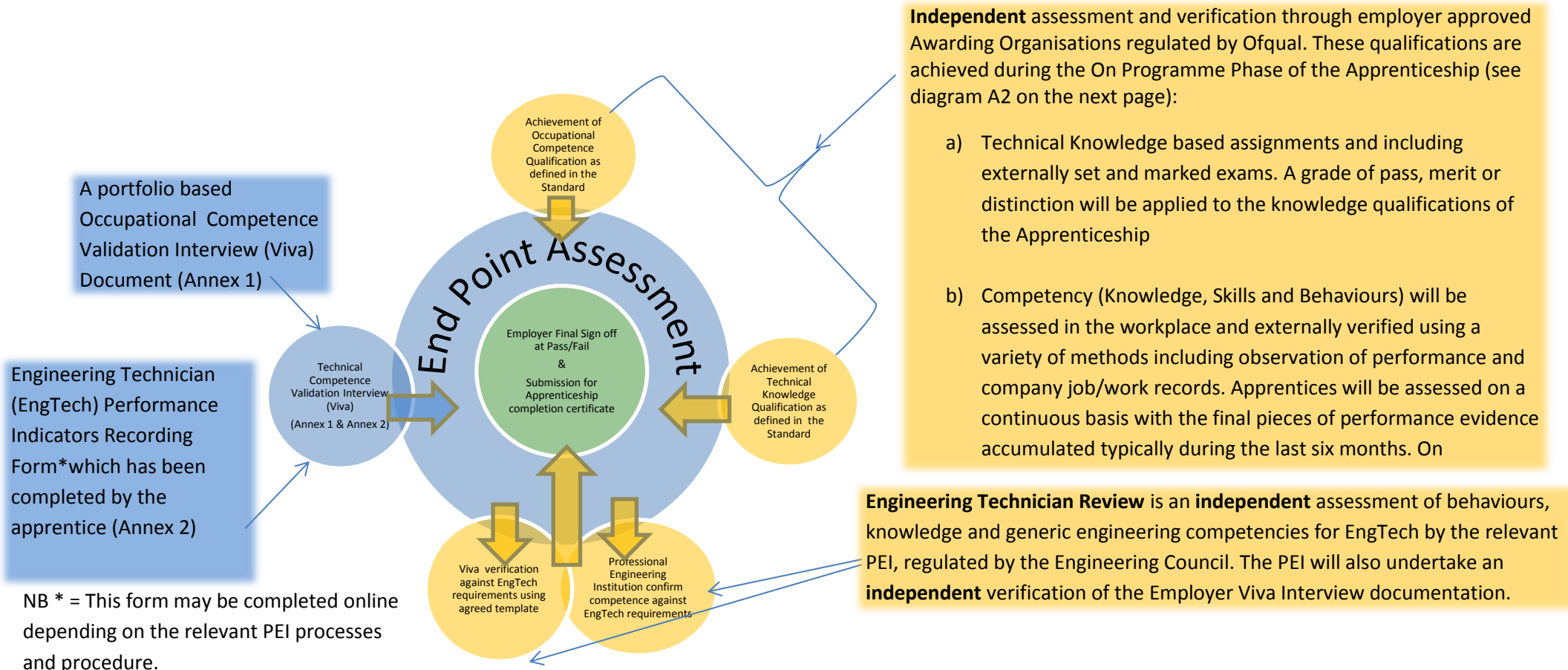
- 1) *We have introduced a formal gate review at the conclusion of the foundation stage. Apprentices will not progress beyond this without successful completion of this stage.*
- 2) *We have introduced a viva and formal overall assessment of competence as part of the end point assessment for the Aerospace Manufacturing Sector. They will need to demonstrate skills, knowledge and behaviours developed across the Apprenticeship.*
- 3) *We have introduced an alignment of competence to 'Engineering Technician' requirements - the recognised generic professional industry standard for Engineering Technicians. This is totally new and is supported by all the relevant Professional Engineering Institutions. This provides an opportunity to establish future development activity for apprentices, linked to continued professional development.*
- 4) *We are also taking a radically different approach with Awarding Organisations to develop new Trailblazer qualifications, including a consistent approach to grading and assessment.*

Due to the safety critical and complex nature of engineering training much of the assessment needs to be carried out 'on a continuous basis' to ensure that the skills, knowledge and behaviours that relate to company processes and procedures are fully imbedded in the apprentice's skill set. Because of the safety critical nature of the work roles and the risks to both the apprentice and the business any deficiencies or gaps in skills, knowledge and behaviours must be identified early and corrected rather than being allowed to proliferate, only then to be picked up at the end of training when it is too late.

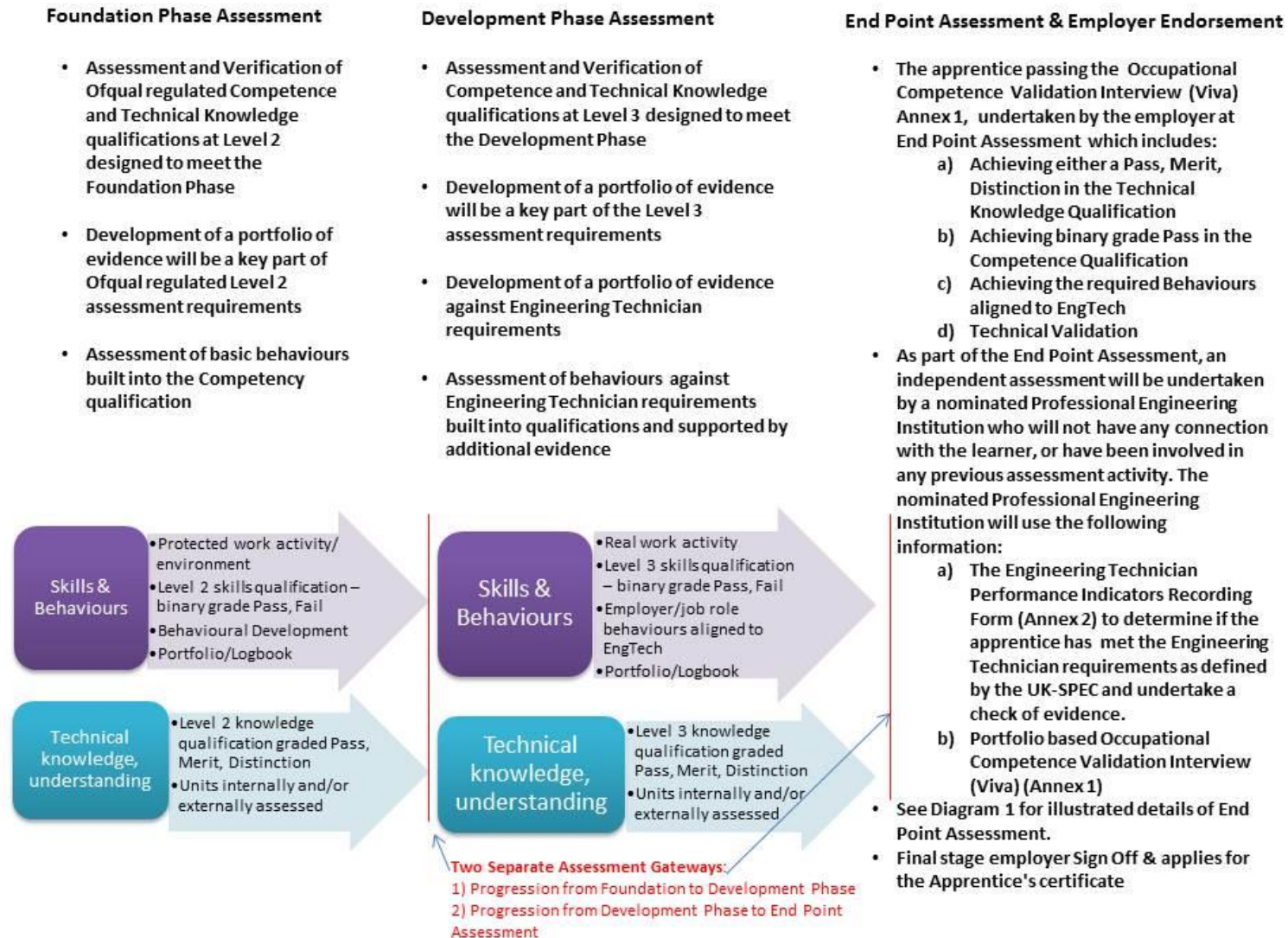
*The assessment model, including end point, makes the Standard accessible and appropriate for employers, including SMEs. The mandatory requirements have been carefully selected to ensure that skills, knowledge and behaviours can be transferred across the Advanced Manufacturing and Engineering Sector. **(Aerospace Manufacturing Sector Trailblazer Group, April 2015)***

Section A: Summary of End Point Assessment

A1 Diagram 1: End Point Assessment for an Aerospace Manufacturing Electrical/Mechanical and Systems Fitter



A2 Diagram 2: Summary approach to “On-Programme” and End Point Assessment, including interaction with mandatory qualifications



Section B: Detailed explanation of the end point assessment

B1 What skills, knowledge and behaviours are being assessed?

B1.1 Occupational Competence. Employers across the Aerospace and Aviation sectors have worked collaboratively to produce a suite of Employer Units of Competence (EUCs). Each EUC sets out in detail the skills, knowledge and behaviours that the apprentice must achieve in order to demonstrate that they are occupationally competent in the specific job role and employers tailored requirements including areas such as products, processes, procedures, tools, equipment, materials, documentation and information systems.

This will allow each organisation to develop their own specific and tailored apprentice assessment structure whilst at the same time ensuring that the overall outcome delivers depth, breadth and stretch to enable progression and/or transferability to other employers. The EUCs will form part of the Employer Occupational Brief (EOB) and can be sourced from Annex 3.

B1.2 Professional Competence. Employers in partnership with relevant PEIs will also assess the apprentices' competence against the internationally recognised professional standard for an Engineering Technician (EngTech). Apprentices will be assessed against the following criteria:

- 1) Use engineering knowledge and understanding to apply technical and practical skills.
- 2) Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems or services.
- 3) Accept and exercise personal responsibility.
- 4) Use effective communication and interpersonal skills.
- 5) Make a personal commitment to an appropriate code of professional conduct, recognising obligations to society, the profession and the environment.

To support the end point assessment, Employers and PEIs have developed an Engineering Technician Performance Indicators Recording Form (Annex 2). This will form part of the Employer Occupational Brief (EOB) and can be sourced from Annex 3.

B1.3 Continuous Professional Development (CPD)

Refers to the process of tracking and documenting the skills, knowledge and experience that an individual gains both formally and informally. It's a record of what they experience, learn and then apply. If the apprentice does decide to apply for registration with a relevant Professional Engineering institution at EngTech and/or IEng they must be committed to maintaining and enhancing their competence. They will be required to show evidence that they have taken steps to ensure this, and that they intend to continue to do this in line with the CPD Code for Registrants

What is it for?

The CPD process helps the individual manage their own development on an ongoing basis. It's function is to help them record, review and reflect on what they learn

The key features of the CPD process

- be a documented process
- be self-directed: driven by the individual and not the employer
- focus on learning from experience, reflective learning and review
- help individuals to set development goals and objectives
- include both formal and informal learning.

What are the benefits?

It can help individuals to reflect, review and document their learning and to develop and update their professional knowledge and skills. It is also very useful to:

- provides an overview of their professional development to date
- reminds them of their achievements and how far they have progressed
- directs their career and helps them keep their eye on their career goals
- uncovers gaps in their skills, knowledge and behaviours
- demonstrates their professional standing to employers and/or clients
- helps with their career development

B2 How will the “what” be assessed?

Typically, this assessment takes place in the final months of the Apprenticeship, using a range of assessment methods:

- Portfolio of evidence of occupational competence
- Independent assessment and verification of employer developed competence and technical knowledge qualifications
- Occupational Competence Validation Interview (Viva)
- Professional competence assessment undertaken by independent assessor(s) (PEI)
- Final employer endorsement of occupational and professional competence

B2.1 Portfolio of Evidence

Before the Occupational Competence Validation Interview (Viva) each apprentice will prepare and submit a supporting portfolio of evidence to the employer. This portfolio will enable the apprentice to demonstrate to the employer the specific work related tasks that they have completed in order to demonstrate how they have achieved both occupational and professional competence set out in the Aerospace Manufacturing Electrical/Mechanical and Systems Fitter Standard and Employer Occupational Brief. The portfolio will also give the apprentice the opportunity to demonstrate to the employer that they understand the company in terms of their products, processes, procedures, tools, equipment, materials, documentation and information systems by showcasing what they have done, what they have learnt and how they have applied this knowledge and skills to real work tasks including solving engineering related problems.

The portfolio of evidence will show how the apprentice has demonstrated the knowledge, skills and behaviours required to be a competent Aerospace Manufacturing Electrical/Mechanical and Systems Fitter and professional competence at EngTech Level. The portfolio will include as a minimum:

B2.1.1 Occupational Competence

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Three different examples of competent performance evidence that must include:

- Products of the apprentices work, such as items that have been produced or worked on, drawings, plans, production and/or quality records, reports, documents produced as part of a work activity, records or photographs of the completed activity

together with:

- Evidence of the way the apprentice carried out the activities to meet the requirements of Standard, such as assessor observations, supervisor/mentor references/ witness testimonies or authenticated apprentice reports of the activities undertaken.

B2.1.2 Professional Competence (EngTech)

The apprentice's portfolio will also contain sufficient, valid and reliable evidence which is referenced to the **professional competence** requirements for an Engineering Technician (EngTech). The evidence will be cross referenced to the Engineering Technicians Performance Indicators form (Annex 2) and contain evidence where the apprentice has met the following criteria:

- 1) Use engineering knowledge and understanding to apply technical and practical skills.
- 2) Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems or services.
- 3) Accept and exercise personal responsibility.
- 4) Use effective communication and interpersonal skills (behaviours)
- 5) Make a personal commitment to an appropriate code of professional conduct, recognising obligations to society, the profession and the environment.

Employer Assessors/mentors and/or their nominated Training Provider/Assessor should assist the apprentice in planning, creating and recording evidence to create the portfolio to ensure opportunities to obtain all the necessary competencies, skills and knowledge and behaviours are identified.

The compiled portfolio of evidence will be reviewed internally by the Employer Assessors/mentor and/or their nominated Training Provider/Assessor to ensure it meets the required standard for occupational and professional competence. When agreed it does, the portfolio will be submitted to the employer representative undertaking the Occupational Competence Validation Interview (Viva) (Annex 1).

If the review and assessment of the portfolio of evidence, in its entirety **does not** contain sufficient evidence to meet the standard then it will be deemed not yet ready to submit for Occupational Competence Validation Interview (Viva) (Annex 1). The apprentice will be advised about the shortfalls in evidence and how this can be addressed.

B2.2 Occupational Competence Validation Interview (Viva)

The Occupational Competence Validation Interview (Annex 1) is an interactive interview focused on all the components of the Apprenticeship Standard, which will enable the employer to validate the apprentices' **occupational competence**. It is a structured and formal discussion between the apprentice and their employer, drawing upon a portfolio of evidence, and records of how the apprentice has performed during the Apprenticeship. It covers both what tasks the apprentice has completed in the workplace, the standard of their work, and the behaviours they have demonstrated throughout, such as, being a team player, having a positive attitude, a strong work ethic, being responsible employee, self-motivated and a proven commitment to the organisation. This enables the end point assessment to cover a broad range of knowledge and understanding, skills and behaviours, such as:

- the methods and techniques used to fit electrical/mechanical components/systems to aircraft
- company quality processes and procedures and documentation
- understanding the practical and theoretical requirements of aerospace electrical/mechanical components/systems
- being proactive in finding solutions to problems and identifying areas for improving the business.
- demonstrate effective interpersonal skills (behaviours)
- complying with statutory, organisational and health and safety regulations while carrying out manufacturing techniques

It will also be an opportunity for the employer to:

- clarify any points and/or probe the apprentice on the evidence they have presented in their portfolio
- confirm and validate that the portfolio of evidence is the apprentices own work
- confirm and validate the judgements about the quality of the work the apprentice has completed

- explore particular areas of work presented in the portfolio, how it was carried out, any problems that they encountered and how these were resolved.
- validate the apprentices skills and knowledge and understanding of the company in terms of their products, processes, procedures, tools, equipment, materials, documentation and information systems.

The Occupational Competence Validation Interview will also elicit the apprentice's depth and breadth of understanding of the **professional competence** requirements for an Engineering Technician (EngTech). These will be evidenced in the apprentice's Engineering Technicians Performance Indicators form (Annex 2).

To ensure a consistency of approach, a guidance document on how to conduct a robust Occupational Competence Validation Interview (Viva) (Annex 1) will be published and available (Annex 7).

Note: Before the Occupational Competence Validation Interview (Viva) (Annex 1) can take place, the employer must have evidence that the apprentice has completed and will be awarded the mandatory vocational qualifications required for this Standard - completed during the "On Programme" phase of the Apprenticeship i.e in this case:

- Level 2 Aerospace and Aviation (Foundation Competence)
- Level 2 Aerospace and Aviation (Foundation Technical Knowledge)
- Level 3 Aerospace and Aviation (Development Competence)
- Level 3 Aerospace and Aviation (Development Technical Knowledge)

(NB: working titles -currently in development)

On completion of the Occupational Competence Validation Interview (Viva) (Annex 1) the apprentice will be awarded a grade of Pass or Fail. i.e. Competent or not yet Competent.

Professional Engineering Institution (PEI) EngTech Independent Assessment and Viva Verification

On successful completion of the Occupational Competence Validation Interview (Viva) (Annex 1) i.e. achieving a pass grade, the completed Engineering Technicians Performance Indicators Form (Annex 2) and any supporting evidence will be sent to the employer designated Professional Engineering Institution (PEI) to assess the apprentice's readiness for professional recognition at EngTech Level.

On completion of the EngTech assessment and Viva verification the Professional Engineering Institution will notify the employer and/or their nominated training provider by letter if the apprentice has been successful or not. If not, the apprentice will be advised of the shortfall in evidence and given advice and guidance on the type and level of evidence that will be required to meet the required professional standard.

Final Sign Off – Employer Endorsement

If successful, i.e. the employer is in receipt of the letter from the PEI stating that the apprentice is EngTech ready, the employer will undertake the Final Sign Off / Employer Endorsement stage of the Apprenticeship by:

- signing the Occupational Competence Validation Interview (Viva) (Annex 1) document along with the apprentice and the employer (nominated Training Provider optional)
- making an application to the designated body for the Apprenticeship completion certificate

B3) Who will do the assessment?

The end point assessment will be undertaken by a range of parties depending upon the nature of what is being assessed. For final judgements to be made the following is required:

- 1) The employer and where applicable in partnership with their designated Training Provider/Assessor will have final judgement on the Occupational Competence of the apprentice. **Note:** Prior to the end point assessment the employer will already have received confirmation from the relevant Awarding Organisation(s) that the required mandatory vocational qualifications have been achieved, as part of the “on-programme” assessment. This will be recorded on the Occupational Competence Validation Interview (Viva) Annex 1.
- 2) The Independent Assessor(s) from the relevant Professional Engineering Institution will have final judgement on the Professional Competence of the apprentice by reviewing, assessing and verifying the evidence and any supporting documentation contained in the following
 - Occupational Competence Validation Interview (Viva) (Annex 1)
 - Engineering Technicians Performance Indicators Form (Annex 2)

B3.1 The Employer

The employer

- The employer will conduct the Occupational Competence Validation Interview (Viva) (Annex 1) to judge Occupational Competence. The employer is best placed to determine whether an apprentice has the required knowledge, skills and behaviours to fulfil the designated role, a support guide will be produced and available to assist the employer during the interview (Annex 7). The employer will have understanding and expertise in the area in which the apprentice works and will know what questions to ask the apprentice in order to ascertain their level of competency. This will be particularly important due to the health and safety critical nature of the sector. During this Viva the apprentice will need to demonstrate competence of the appropriate knowledge, skills and behaviours to the employer, drawing from real work based tasks accomplished, presenting not only what they have done, but how they have done it and why. The apprentice's use of a Portfolio of Evidence is important here so that the employer can see tangible evidence. (Occupational Competence Validation Interview (Viva) (Annex 1).
- The employer will also review the Professional Competence Performance Indicators Form (Annex 2) in preparation for submission to the relevant PEI for a final independent judgement to be made.

B3.2 Independent Assessor(s) from the relevant Professional Engineering Institution

- Independent assessor(s) will validate the initial judgement made by the employer recorded on the EngTech Performance Indicators Form (Annex 2). In terms of making their final independent judgement of Professional Competence this will be based on EngTech requirements as defined in the Engineering Council's UKSPEC. The independent assessor(s) must be affiliated to the PEI with which the employer initially confirmed to undertake end point assessment. Engineering Technicians Performance Indicators Form (Annex 2) and a process flow of the steps the PEI will complete can be found in Section D4 diagram 3.
- Independent assessor(s) from the PEI will also examine the Viva documentation, signed by the employer and used as evidence to judge Occupational Competence, this enabling a validation of the Viva process and documentation. However, it is the employer who will make the final judgement of an apprentice's Occupational Competence.

B3.3 Final Sign Off – Employer Endorsement

If successful, the employer will undertake the Final Sign Off / Employer Endorsement stage of the Apprenticeship by:

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- signing the Occupational Competence Validation Interview (Viva) (Annex 1) document along with the apprentice and the employer nominated Training Provider (optional)
- making an application to the designated body for the Apprenticeship completion certificate

B4 How will assessments be quality assured?

B4.1 General note on future Governance and Quality Assurance arrangements

We are considering employer led approaches for quality assurance and governance, and are working through the options with BIS. At the moment awarding organisations who wish to deliver against the standard will need to be on the SFA register of assessment organisations.

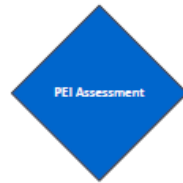
B4.2 PEI Quality Assurance

All PEIs work to a common set of standards for registration (as set out in UK-SPEC) and are licensed by the Engineering Council to carry out all registration activity including accreditation/approval of academic programmes; Professional Review and interview of applicants to the register. PEIs are regularly monitored by Engineering Council, including annual self-assessment and full license reviews are carried out every five years. In addition, all PEIs have independent, internal review and audit procedures in place. Liaison officers from the Engineering Council are invited to attend all registration committee meeting to observe process and compliance.

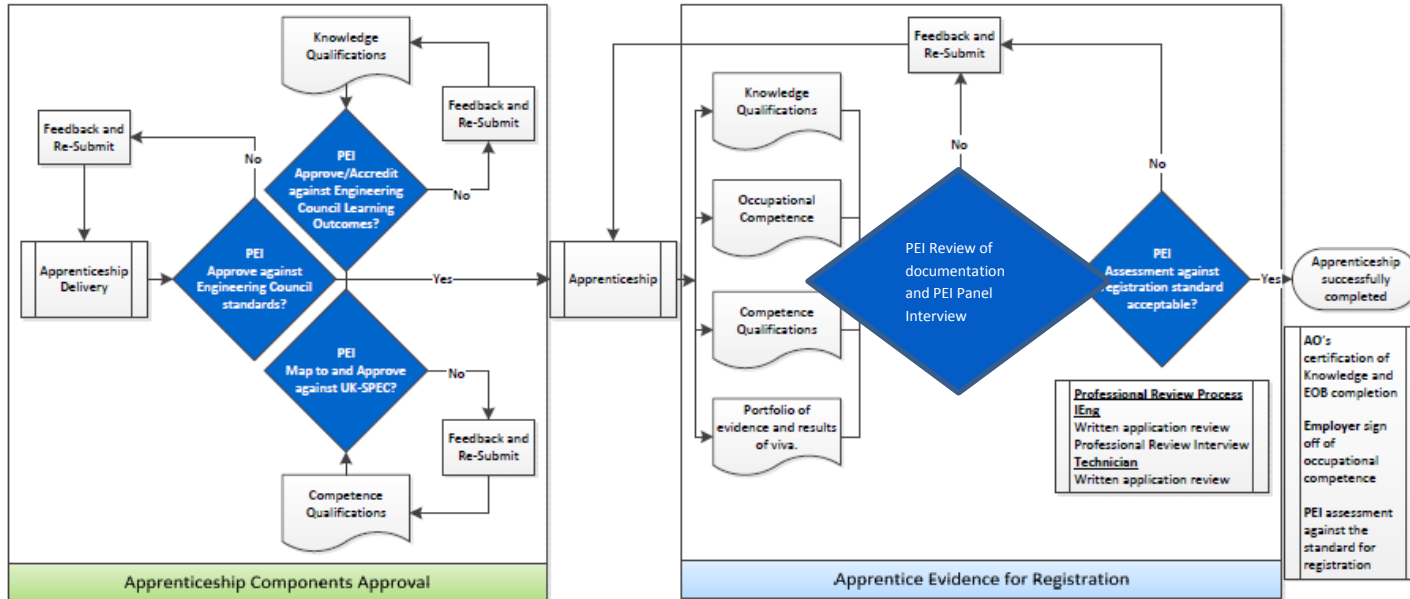
Diagram 2: PEI Quality Assurance Process

All assessment stages marked thus are carried out by Professionally Registered Engineers who are PEI Trained Assessors.

Registration linked PEI processes are audited by the Engineering Council



All assessment stages marked thus are carried out by Volunteer, Professionally Registered Engineers who are PEI Trained Assessors. Registration linked PEI processes are audited by the Engineering Council.



SECTION C – Grading

C1 How will grading be applied?

The following grading will apply for the End Point Assessment:

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- For the Occupational Competence Validation Interview (viva) (Annex 1) this will be a binary pass /fail grade
- For the Professional Competence this will be Pass/ Fail i.e. a pass will mean they have met the requirements for EngTech. Therefore should they wish to apply for professional registration they are deemed as EngTech ready.

It is important to note the Standard has mandatory qualifications as part of “On programme assessment”. The knowledge qualifications will be assessed on a pass, merit and distinction grading, the occupational competence will be a binary grade Pass/Fail i.e. “competent” “not yet competent”. Due to the complex and safety critical nature of the industry a grading exemption note was approved by the Skills Minister for this Standard (Annex 8).

SECTION D - Implementation

D1 Milestone Planner

A planner has been developed to highlight the key development milestones in order for the assessment plan to be successfully implemented. This approach to development and implementation will continue to be informed by close consultation with training providers, awarding organisations and professional bodies, as well as other assessment specialists. The planner is located here [Aerospace Manufacturing Electrical/Mechanical and Systems Fitter Standard - Implementation Milestone Planner <Insert URL>](#)

Organisations involved in the development and delivery of Assessment tools

The sector has required a collaborative approach involving the following:

- Employer representatives (development)
- Awarding Organisations (development & delivery)
- Sector Skills Council (development)
- Professional Engineering Institutions (development & independent assessment)
- Training Providers and their representative bodies (Development, delivery and communications)

To ensure standardisation and consistency the sector has worked on a collaborative basis with Automotive, Maritime and the wider Advanced Manufacturing Sector. As part of the pilot process the sector will be trialling some of the assessment tools with a view to full role out in September 2016.

There is good evidence of collaboration between the AOs to minimise potential future risk in terms of capacity and infrastructure. PEIs currently involved in the assessment of EngTech applicants, which includes apprentices, are modelling the impact and gearing up to deliver the expected growth.

D2 Communications Strategy for the Sector

A communications plan has been prepared to ensure that appropriate and timely advice and guidance is rolled out. In particular, briefings have been delivered across the country since March 2015 to enable all relevant stakeholders to be involved in this new Apprenticeship Standard and Assessment approach. These briefings have been conducted in conjunction with other AME sectors such as Automotive to ensure consistency of message and maximisation of reach. There will be a further roll out of briefings during 2015 and 2016.

D3 Costs of End Point Assessment

The costs allocated to end point assessment equates to approximately 3% of the overall costing for the delivery and assessment requirements for the Apprenticeship. The cost for end point assessment includes the following

- Occupational Competence Validation Portfolio Collation
- Occupational Competence Validation Interview (Viva)
- Professional Engineering Institution Validation Costs (EngTech)
- Employer "Final sign off"
- Apprenticeship Certificate

D4 Supporting Information

Annex 5 contains letters of support from Professional Engineering Institutions, as the Apprenticeship Standard aligns to EngTech requirements. A model for the PEI employer engagement process has been agreed, which is outlined in diagram 3 below.

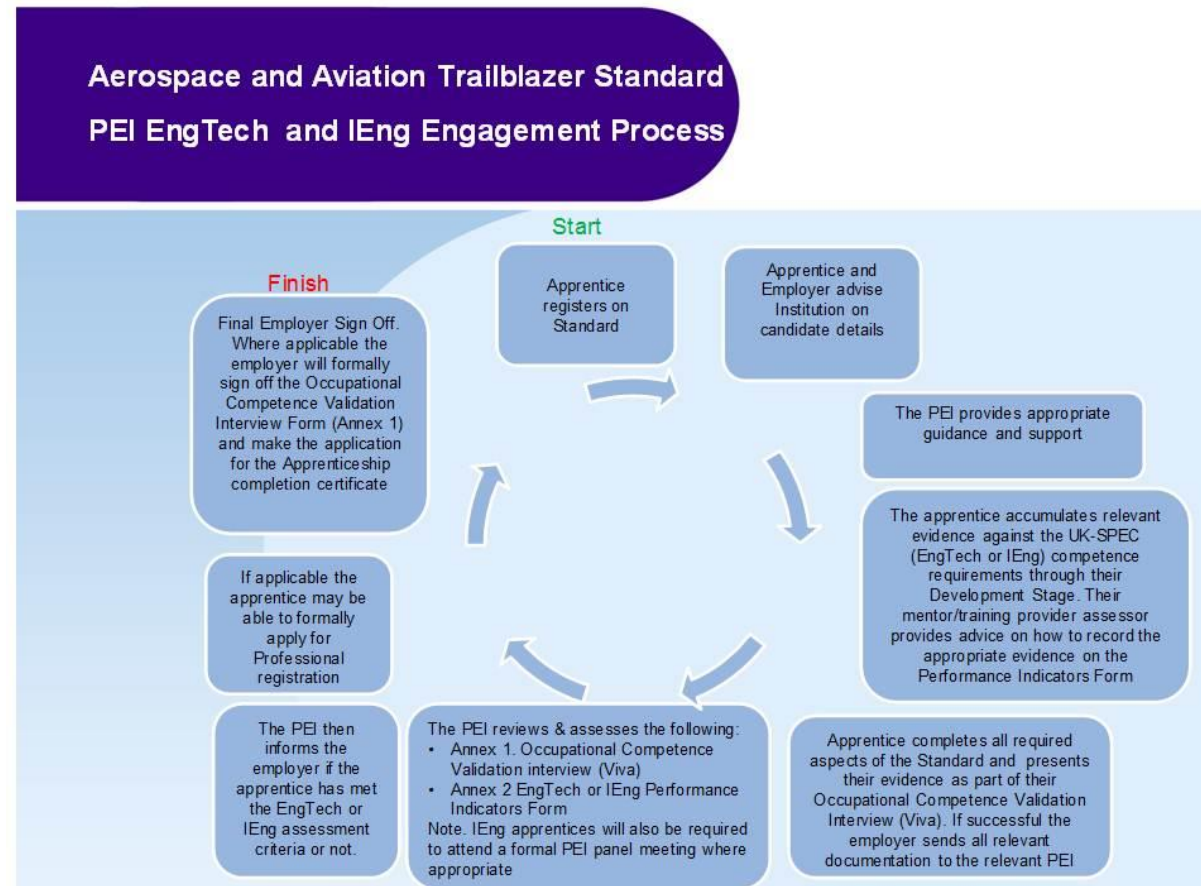


Diagram 3 - EngTech Engagement Process

Annexes

Annex 1 [Occupational Competence Validation Interview \(Viva\) <Insert URL>](#)

Annex 2 [Engineering Technician \(EngTech\) Performance Indicators Recording Form <Insert URL>](#)

Annex 3 [Employer Occupational Brief <Insert URL>](#)

The Employer Occupation Brief is an all-embracing term being used by employers and will contain a number of separate documents.

Employer Occupational Brief
Foundation Phase - Employer Units of Competence
Foundation Phase - Qualification Structure(s)
Development Phase - Employer Units of Competence
Development Phase - Qualification Structure(s)
Qualification Assessment Strategy for Foundation & Development Phase
Employer Approved Awarding Organisation Qualifications Document

Note: In order to articulate the specific level of skills, knowledge and behaviours required to be achieved and assessed to demonstrate full occupational competence in the foundation and development phase of the Apprenticeship. The employers on the Trailblazer group have developed a more detailed **Employer Occupational Brief (EOB)**.

The brief 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.

Annex 4 – The journey to End Point Assessment

Whilst there is significant emphasis placed on the end point assessment it is important to describe the learner journey an apprentice will undergo to be ready for end point assessment and employer sign off. The Aerospace Employer Trailblazer group has developed two mandatory phases which the apprentice must complete, namely the Foundation Phase and the Development Phase.

The Foundation Phase

This is a significant period of off-the-job training in a protected environment at Level 2 covering three key aspects of training, basic engineering skills, relevant underpinning knowledge and behavioural development. The basic engineering skills include core or 'mandatory' requirements, together with a range of tailored engineering skills units required to meet the specific needs of individual employers. Academic study will underpin skills development and will form the preparation for achievement of the main academic component. During this time apprentices will develop the appropriate behaviours to support their learning. This phase will culminate in a gateway assessment to ensure a strong foundation of basic skills and knowledge has been developed through the achievement of Level 2 Technical Knowledge and Competence Qualifications.

The Foundation Phase gateway assessment is based on the achievement of 3 elements:

The assessment is undertaken at the end of the first year of training and all elements must be achieved for the apprentice to advance onto the development phase of the apprenticeship.

- **Foundation Vocational Skills:** A brand new vocational skills qualification at Level 2 – Aerospace & Aviation (Foundation Competence) has been developed to cover the core basic skills identified in this Standard. This has been developed in consultation with employers including small, medium and large employers. It will have a core and options configuration to cover the basic skills identified and allows for the variation in the delivery context. It will be delivered off-the-job in controlled circumstances. Foundation Vocational skills achievement is graded competent or not yet competent.

- **Technical Knowledge:** A technical knowledge qualification at Level 2 has been developed which fully underpins the core skills and knowledge requirements identified in the Standard. Technical Knowledge achievement being graded Pass, Merit or Distinction.
- **Behaviours:** The behaviours have incorporated into both the skills and underpinning knowledge qualifications and achievement is graded competent or not yet competent.

A gateway assessment is undertaken on the completion of the two vocational qualifications in order for the apprentice to progress onto the development phase.

The Development Phase

In this Phase further vocational and academic learning will build upon the basic skills and knowledge acquired from the Foundation Phase and focus on developing further on-the-job skills capability. The Assessment of achievement is based on 3 elements:

- **Vocational Skills:** A vocational skills qualification at Level 3 to cover the further skills capability identified at Level 3 in the 'Aerospace Manufacturing Electrical/Mechanical and Systems Fitter Standard'. Again we have involved a wide range of employers, particularly small employers in the design and specification process, and have taken advice with regard to both content and assessment.
- **Technical Knowledge:** A complementary Level 3 Technical Knowledge Qualification that underpins the vocational skills requirements identified above and articulated in the Standard.
- **Behavioural** achievement is graded competent or not yet competent and is linked to the requirements of the Engineering Technician UK-SPEC produced by the Engineering Council.

Annex 5 – Letters of Endorsement

Letters of endorsement have been submitted by Professional Engineering Institutions and are located here [< Insert URL >](#)

Annex 6 – Occupational Architecture

The Employer Trailblazer Group has undertaken an occupational mapping exercise displaying the Apprenticeship Standards produced and to be developed. This exercise is being undertaken across the wider Advanced Manufacturing and Engineering sector and is located here [< Insert URL >](#)

Annex 7 - [Employer Guide for the Occupational Competence Validation Interview \(Viva\) <Insert URL>](#)

Annex 8 - [Grading Exemption Note <Insert URL>](#)