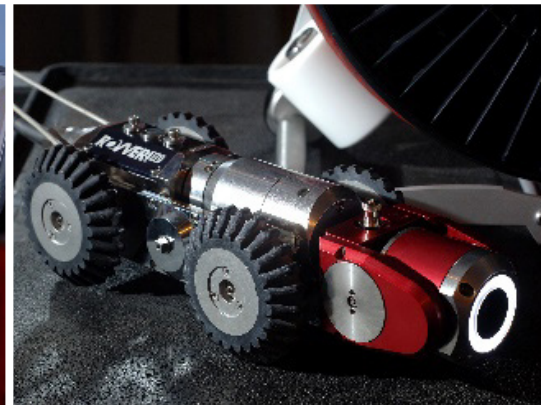
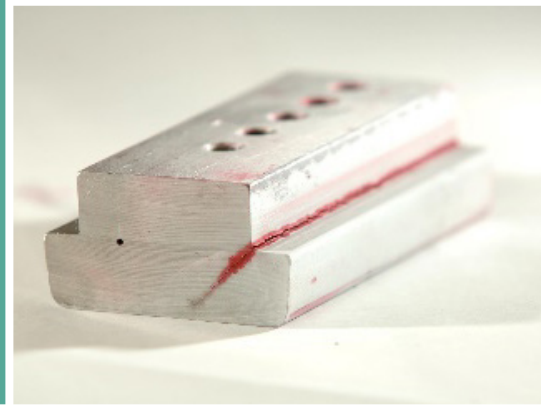
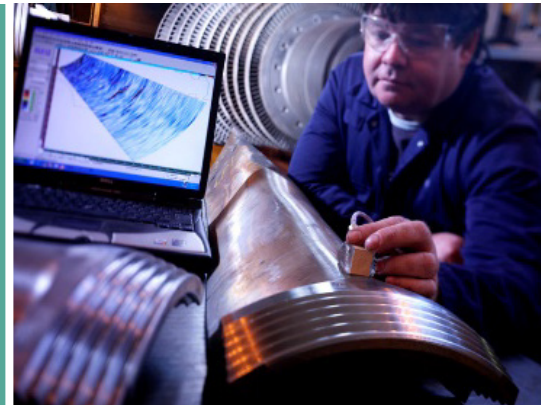
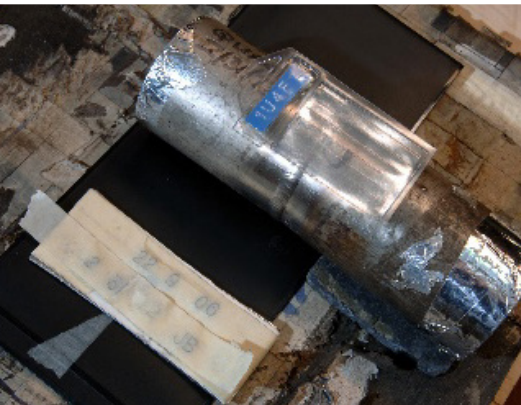
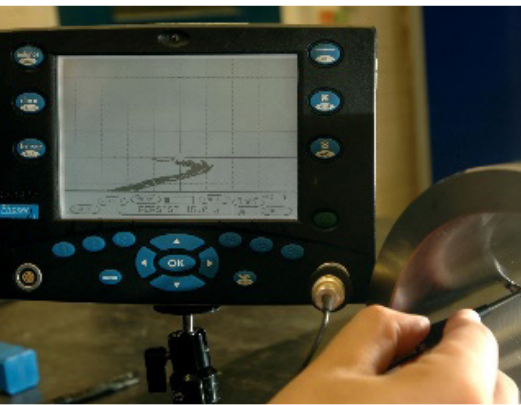


Non-Destructive Testing (NDT) Engineering Technician – On-Programme Competency Development

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APPRENTICESHIPS

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*Requirements and responsibilities for all those involved in the
Non-Destructive Testing (NDT) Engineering Technician Apprenticeship*



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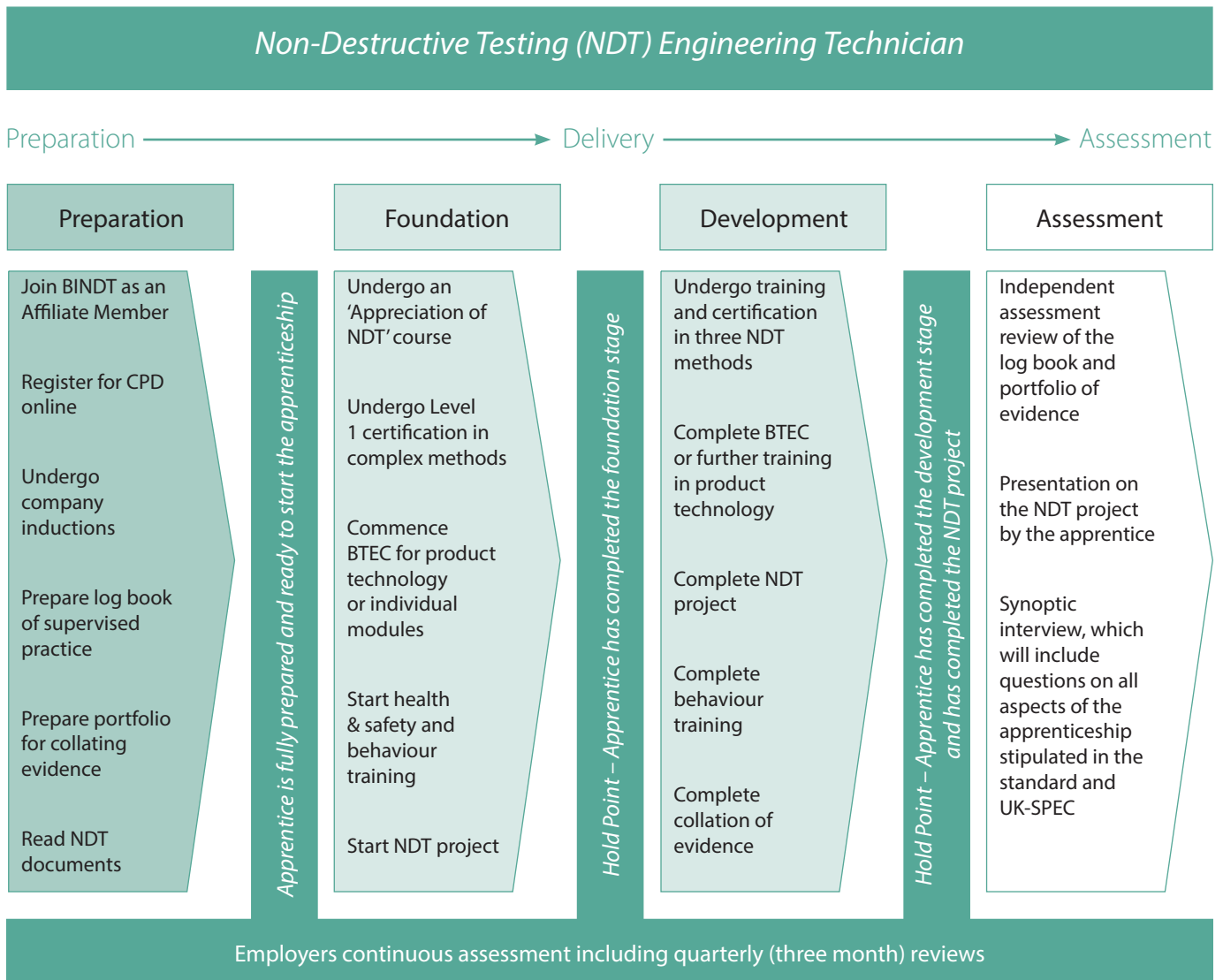


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Overview of the Apprenticeship Scheme – Schematic



1. Introduction

This document explains the rationale for the development of the Non-Destructive Testing (NDT) Engineering Technician apprenticeship. It describes the process of how the scheme has been developed and, most importantly, it defines the responsibilities for those participating in the scheme.

Non-destructive testing (NDT) is a mechanism used by engineers to detect defects in materials and structures, either during manufacturing or while in service. Typically, the methods used are ultrasonic, radiography, magnetic particle, eddy current, dye penetrant, infrared thermography and visual methods. These methods are available when the employer chooses which methods to include within the apprentice's programme.

2. Apprenticeship Rationale

Every day, more than 25,000 inspections are carried out in factories and on-site in the UK to detect defects and damage in a huge range of products, plant and structures; it is estimated that there are more than 120,000 NDT inspectors operating worldwide.

Historically, the career opportunity for individuals to become an NDT inspector was through transferring from another industry sector, in some cases from a related engineering discipline, or from a completely unrelated industry. Rarely did people join the NDT sector straight from school and a recent study in Europe suggested there was an alarming reliance on inspectors over the age of 50.

Because NDT certification is personally achieved and NDT skills are easily transferable between different companies, there was reluctance on the part of employers to spend significant amounts of money on training their NDT inspectors. This resulted in a narrow focus of training in just the basic NDT skills, without considering the wider context in which an NDT inspector would become far more competent if they benefitted from wider engineering knowledge, health & safety training and behavioural skills.

The new Trailblazer apprenticeship scheme seeks to address some of the historical anomalies by:

- Setting a high mandatory standard at the beginning of the apprenticeship, which includes wide-ranging engineering, health & safety and behaviour knowledge and skills;
- Offering considerable assistance with funding for training and examinations; and
- Providing incentives for taking prospective apprentices straight from school at the age of 18+ or out of school at the age of 16+.

3. Apprenticeship Development Process

In terms of the process, the apprenticeship is split into three distinct sections: development of the 'NDT Standard' (Ref. 4), development of the 'Assessment Plan' (Ref. 5) and managing an apprentice through the apprenticeship scheme.

3.1 NDT Engineering Technician Apprenticeship Standard

The NDT Engineering Technician apprenticeship standard is a mandatory concept document that has been approved by the Minister of State for the Department of Business, Innovation & Skills and the Department of Education. The standard contains details of the knowledge, skills and behaviours that must be achieved during the apprenticeship. Also implicit within the standard is that knowledge, skills and behaviours omitted from the standard cannot be made mandatory and are unlikely to be funded. The NDT Engineering Technician apprenticeship standard has been established by a development group, which includes 40 to 50 leaders in the NDT industry.

3.2 Assessment Plan

The NDT assessment plan is a mandatory document that has been approved by the Minister of State for the Department of Business, Innovation & Skills and the Department of Education. The assessment plan details 'What', 'By whom' and 'How' the output from the apprenticeship will be assessed. The assessment is split between three separate activities, which are weighted to reflect their importance:

- A document review, which will assess the portfolio of evidence (course attendance, test results, examination results, certificates and employer's reports), log book of experience, project report, CPD compliance, BINDT membership, EngTech competency matching form and anything else that is germane to the success of the apprenticeship. 15% maximum
- A project showcase presentation – a presentation by the apprentice on the NDT project detailing a step-by-step approach to completing the project successfully. 60% maximum
- End-point interview covering technical considerations not covered by the project showcase presentation, health & safety, behaviours and EngTech requirements. 25% maximum.

Although the scoring is weighted between these three activities, it will be necessary to achieve the desired minimum percentage in each of these categories. The required mark to gain a 'pass' in the apprenticeship scheme is 70%, whereas to gain a 'distinction' it will be 80%.

3.3 Managing the Apprenticeship

Unlike the development of the standard and the assessment plan, managing the apprentice throughout the apprenticeship is not documented elsewhere and is left entirely to the employer to do. Within this document, guidance is given to the employer, together with contact details of where to obtain further advice.

4. Apprentice's Responsibilities

4.1 Preparation

Affiliate Membership of BINDT – The apprentice should register online with BINDT as an Affiliate Member of the British Institute of NDT (free membership). This will bring considerable benefits to the apprentice in terms of information and learning materials. In addition to the information provided online, the apprentice will be sent two of the Institute's monthly periodicals, *Insight* and *NDT News*. Being an Affiliate Member of BINDT is highly recommended.

Continuing Professional Development (CPD) – At the same time as registering online to become an Affiliate Member of BINDT, the apprentice should also register to create and maintain an online record of CPD. This will enable the apprentice to maintain an employment/training/qualification paper trail, which is a requirement of the Engineering Council. Registering online for CPD is highly recommended.

Log book – It will be necessary for the apprentice to keep an up-to-date log book for logging NDT experience (defined as supervised practice). The log book should be filled in on a daily basis and counter-signed by the supervisor. Log books will be provided by the professional body, the British Institute of NDT. Maintaining a log book of supervised practice is a mandatory requirement.

The requirement for on-the-job training (supervised practice) is mandated in national and international standards, such as EN ISO 9712 (Ref. 1) and EN 4179 (Ref. 2). This is a requirement of the certification body (EN ISO 9712) and employer (EN 4179) and certificates or letters of approval will not be issued until this requirement is met.

The person carrying out the supervision needs to be suitably experienced and qualified in the application of the NDT method(s) undertaken. The end-point assessment will review the extent of experience gained for each NDT method during the apprenticeship. For the purpose of this apprenticeship, experience may include:

- Carrying out the method(s) under supervision
- Working closely with a suitably experienced inspector who is inspecting a weld, component or material, etc
- Working within a team carrying out the method(s)
- Fast-tracked training at a training centre
- Supervised practice at a training school
- Calibrating equipment
- Checking the parameters of equipment, such as probe angles, beam spread or magnetic flux, etc
- Carrying out any other activities of the method identified in the syllabus.

If the apprentice is attempting more than one method at the same time, within the apprenticeship it is recognised that there are some common themes, such as product technology, that run through all methods and therefore allowances (a reduction of time) in experience is allowed for.

The supervisor for on-the-job training (experience) will ensure that the apprentice keeps a daily log of experience and initials each entry to authenticate compliance.

Evidence Portfolio – It will be necessary for the apprentice to maintain an evidence portfolio for collating attendance certificates, examination results and other documents. Maintaining a portfolio of evidence is a mandatory requirement.

Apprenticeship Guidance Document – This document has been prepared by the NDT Trailblazer Development Group and is intended to offer guidance to the apprentice and the employer regarding the choice of NDT methods that need to be undertaken during the apprenticeship. The apprenticeship guidance document (Ref. 6) can be found on the BINDT website in the apprenticeship document download section.

Engineering Council's Documentation – The apprentice needs to make him/herself familiar with the contents of the UK-SPEC – UK Standard for Professional Engineering Competence (Ref. 3), particularly the EngTech registration section. The apprentice will also need to obtain a copy of the EngTech competency matching document, which will need to be filled in at the end of the apprenticeship. Both of these documents can be downloaded from the apprenticeship section of the BINDT website.

Codes of Conduct – The apprentice will need to understand and conform to the BINDT and UK-SPEC codes of conduct (Ref. 9). Both of these documents can be downloaded from the apprenticeship section of the BINDT website.

Employer's Units of Competence – These documents are Appendices 1 to 12 of this document but are filed individually for ease of use. The purpose of the employer's units of competence (Ref. 8) is to provide guidance as to what each NDT method and other related activities include in terms of competency requirements. These documents can be downloaded from the apprenticeship section of the BINDT website.

Gantt Chart (work plan) – At the beginning of the apprenticeship, working with the employer, the apprentice should prepare a simple Gantt chart (work plan) of the intended apprenticeship programme. The work plan will detail what training and examinations will take place and when they will occur, as well as any other training modules. The work plan can be flexible and modifiable but needs to take into account the necessity of experience associated with each of the NDT Level 2 methods. Preparing a Gantt chart at the beginning of the apprenticeship is highly recommended.

4.2 Foundation Stage

During the foundation stage of the apprenticeship, which will last for the first six months, the apprentice is expected to gain a basic understanding of the knowledge, skills and behaviours requirements and will cover NDT methods, product technology, health & safety and behaviours. The apprentice, under the direction of the employer, will choose the three NDT methods he/she will undertake during the apprenticeship. Apprentices are required to include at least one complex NDT method (ultrasonic, eddy current, radiography or thermography) in their apprenticeship programme. For the complex method, the apprentice must achieve NDT Level 1 before they attempt NDT Level 2 and it is advisable to do this during the foundation stage.

During the foundation stage, if the apprentice is a new recruit, he/she will also be involved in company employment processes, such as inductions, registrations, issue of documentation and issue of personal protective equipment (PPE), etc.

The apprentice must complete the foundation stage before he/she will be allowed to progress to the development stage.

4.3 Development Stage

The development stage will last from six months to the end of the apprenticeship, typically three years. The apprentice will be given an NDT project to undertake during the development stage by the employer, which must be completed three months before the end of the apprenticeship. During the last three months, the apprentice will prepare an NDT project report, which will be included in the documentation that is sent to the independent assessment organisation. The apprentice will also create an NDT project showcase presentation which he/she will present to the independent assessment panel.

4.3.1 NDT Project

The NDT project will be a start-to-finish project that requires the apprentice to carry out some research, determine the inspection methodology, prepare an NDT technique sheet, carry out the inspection and report the findings. The NDT project should include as many knowledge and skills requirements identified in the standard as reasonably practicable.

An example of an NDT project might be: ‘Given a weld configuration, casting, forging or other material, determine what steps are needed to fully inspect the component’.

Aspects to consider:

- What type of NDT procedure and technique sheets need to be created?
- Which inspection authority is mandating the inspection?
- Which national or international codes have to be complied with?
- What equipment is required?
- What defects are being sought?
- What material(s) is the component made of?
- Does the specification require surface inspection, volumetric inspection or both?
- What methods would you select to undertake the inspection?
- Are there any testing limitations?
- Are there any special NDT processes required, such as techniques, consumables or probes?
- What are the reporting requirements?

The final activity of the project is to carry out the inspections and report on the findings. The project will be assessed on preparation, planning, methodology, project tasks, inspection and project completion.

4.3.2 Knowledge and Skills

The main thrust of the apprenticeship is to obtain sufficient knowledge and skills that enable the apprentice to meet the requirements of the NDT Engineering Technician standard.

The mandatory knowledge and skills required by the standard are set out below, some of which can be acquired by undertaking a specific programme, such as BTEC, HNC or Performing Engineering Operations (PEO), or achieved by attempting the individual modules. If you are considering a specific programme it is advisable to check the contents with the Skills Funding Agency (SFA) to ensure that it is fundable.

The knowledge and skills required for the engineering apprenticeship are listed below:

- Supervisory techniques, such as leading and motivating, performance evaluation, mentoring junior staff, organising, planning, delegating and solving routine daily problems
- Relevant mathematics, including numerical and data analysis, that is necessary to support the application of technical and practical skills
- Three NDT methods, including a complex method, such as ultrasonics, eddy current, radiography or infrared thermography, with the responsibility for applying multiple scientific principles to identify flaws obscured by structural or volumetric features that are not necessarily visible on the surface
- Formula-based engineering and the scientific principles underpinning relevant current technologies
- How to use materials, equipment, tools, processes and products relating to NDT
- Preparation of NDT procedures, technique sheets and work instructions for use by NDT operators
- How to use and apply information from technical literature, codes of practice and industry standards
- The limitations of standard tests and measurements relevant to their field of activity
- Industry-specific product technology, including material types, defect types, defect mechanisms, growth rates, industry-specific NDT applications and R&D opportunities

- How to use the results of engineering NDT analysis for the purpose of developing solutions to well-defined engineering problems
- The need to gather contextual information prior to the inspection required for the assessment of defects against acceptance/rejection criteria
- Health & safety and company-specific requirements, permits to work, inductions, risk assessments, safety passport, working at heights and in confined spaces, chemical handling, radiation safety, restricted zones (gas, nuclear and site radiography) and other requirements
- Project management processes and key points
- The consequences of failure and the risk to life and the environment
- Demonstrate the ability to manage areas of work that require the coordination and supervision of other staff, such as NDT Operators
- Demonstrate NDT competencies relevant to the industry sector and appropriate materials using equipment, tools and processes
- The ability to carry out NDT in three methods, including at least one complex method, to appropriate national and international certification standards, such as BS EN ISO 9712 or BS EN 4179, that meet the requirements of Engineering Council EngTech registration
- Apply appropriate solutions to well-defined engineering problems using the chosen NDT methods
- Select appropriate methods and techniques and understand their limitations
- Supervise and project manage areas of work, to include, where appropriate, NDT Operator's work and reports for compliance and accuracy; achieve good time management
- Ability to conduct re-inspection audits of NDT Operator's work, comparing and evaluating the results and taking appropriate action when necessary
- Implement quality control and quality assurance of NDT systems and performance
- Operate with good practical ability, including hand/eye coordination, in order to apply NDT
- Follow written procedures in order to demonstrate a disciplined approach
- Identify problems and apply appropriate NDT methods to identify causes and achieve satisfactory solutions and submit clear and precise NDT reports and instructions
- Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact
- Interpret engineering/CAD drawings, particularly those related to weld/component configuration
- Manage a project through to completion.

4.3.3 Experience (Supervised Practice) On-the-Job Training

It is important to understand what is meant by experience in terms of acquiring NDT certification. Experience is mandatory and is defined in the national and international standards as 'supervised practice'. The person carrying out the supervision needs to be certificated and suitably experienced in the application of the NDT method. For the purpose of this apprenticeship, it has been agreed what the definition of experience should be (see section 6).

If you are attempting more than one method at the same time, within the apprenticeship, it is recognised that there are some common themes that run through all methods and therefore there are allowances (*ie* a reduction in time).

The minimum duration of experience for NDT Level 2 in a single method is given in Table 1 below. If you attempt NDT Level 1 followed by NDT Level 2, then the sum total of your experience is the same as that given in the Table.

Table 1. Minimum duration of experience

NDT method	Experience (months)*
Ultrasonic testing (UT)	12
Radiographic testing (RT)	12
Eddy current testing (ET)	12
Visual testing (VT)	4
Magnetic particle testing (MT)	4
Penetrant testing (PT)	4
*Work experience in months is based on a nominal 40 hours/week or the legal week of work. When an individual is working in excess of 40 hours per week, he/she may be credited with experience based on the total number of hours, but he/she will be required to produce evidence of this experience.	

According to the standards, reductions may be applicable if you are carrying out two or more methods at the same time. The professional body (BINDT) or the lead provider will be able to offer advice as to what reductions in experience the apprentice is entitled to.

4.3.4 Behaviours

Behaviours and human factors are just as important as knowledge and skills as they often impact on the outcome of an apprentice's performance.

Once employed, the apprentice is expected to:

- Be a good timekeeper, whether at work or at an off-site training provider
- Conform to the behaviours set out in the standard at the earliest opportunity
- Be respectful to the employer and others involved with the apprenticeship
- Ensure pre-apprenticeship obligations are fulfilled, such as joining the professional body (BINDT) as an Affiliate Member (free), registering with BINDT for Continuing Professional Development (CPD) and receiving the apprenticeship pack from the professional body, through the employer
- Seek advice when there is any aspect of the apprenticeship that is not understood
- Work hard to meet the deadlines set out in the Gantt chart (work plan).

The mandatory **behaviours** requirements are:

Leadership – provide direction, implement plans and motivate people.

Teamwork – to effectively manage a team and to support others where appropriate.

Courage – be willing to make independent decisions and be respected and understood when doing so.

Delivery – to consistently manage things through to timely completion.

Respect – have respect for the abilities of others, particularly those working under your direction.

Influence – have a positive impact and be able to proactively influence others in multiple contexts.

Compassion – have empathy for the predicaments of others, particularly junior staff.

Ethics – to act with maturity, honesty, integrity and responsibility.

Clear focus – avoid distractions and be a good communicator.

Environmental awareness – undertake safe working practices for self and others.

Personal responsibility – take responsibility as an individual and as a team member.

Behaviours will be assessed in the workplace by the employer and at the end-point assessment by the independent assessment organisation.

4.3.5 Activities to be carried out within the last three months of the development stage

Within the last three months of the development stage the apprentice will:

- Complete the project and prepare the project report
- Create a project showcase presentation (normally PowerPoint) to present to the independent assessment organisation. The project showcase presentation will demonstrate how the apprentice has achieved many of the knowledge, skills and behaviours identified in the engineering technician standard
- Complete the Engineering Council UK-SPEC EngTech competency matching form
- Complete the log book of supervised experience
- Assemble the portfolio of evidence, which will include, but not be limited to: the project report, training records, examination results notices, certificates of competence, certificates of attendance and any other useful information about achievements during the apprenticeship.

4.4 Preparing for the End-Point Assessment

Once the apprentice has completed the apprenticeship, he/she should send the log book, portfolio of evidence and the completion certificate (Appendix 15) to the independent assessment organisation. Once the portfolio of evidence has been received, the independent assessment organisation will offer an assessment date to the apprentice.

The format of the end-point assessment will be:

- Review of the portfolio of evidence (apprentice not present)
- Project showcase presentation by the apprentice
- Synoptic interview, which will cover all aspects of the apprenticeship not covered by the project showcase presentation, including the three NDT methods, the other knowledge and skills requirements identified in the standard, the NDT project, CPD, competency matching to the UK-SPEC EngTech registration and behaviours.

Note: to be absolutely clear, every aspect of the standard is subject to scrutiny and questioning at the synoptic interview even though the apprentice may have passed examinations and received certificates during the apprenticeship.

5. Employer's Responsibilities

This section explains the legal and technical responsibilities of the employer when employing an apprentice.

5.1 Pay and Conditions

There are minimum and in some cases mandatory requirements for determining the pay and conditions of the apprentice.

5.1.1 Paying the Apprentice

You must pay apprentices at least the minimum wage rate. The national minimum wage calculator, which you can access online at '<https://www.gov.uk/take-on-an-apprentice/pay-and-conditions-for-apprentices>', works out the exact amount that you have to pay an employee.

5.1.2 Conditions

Apprentices usually work for at least 30 paid hours a week and must work more than 16. You must pay your apprentice for time spent training or studying for a relevant qualification, whether while at work or at a college or training organisation. You must offer apprentices the same conditions as other employees working at similar grades or in similar roles. This includes:

- Paid holidays
- Sick pay
- Any benefits you offer, for example childcare voucher schemes
- Any support you offer, for example coaching or mentoring.

5.1.3 Apprentices and Redundancy

You can't usually make an apprentice redundant simply because you can't afford to pay them, for example if your company runs out of work. This is because you have a contract to train them. You should get legal advice if you think you might have to make an apprentice redundant or want to end the apprenticeship early for another reason. If you have to make an apprentice redundant, then you are expected to make every effort to find another employer to take over the apprenticeship; BINDT, the professional body, will assist you in achieving this. If you're unsure whether you can commit to a full apprenticeship but would still like to hire an apprentice, you can use an apprenticeship training agency.

5.1.4 Apprenticeship Agreement

You must sign an apprenticeship agreement with your apprentice. This gives details of what you agree to do for the apprentice, including:

- How long the apprenticeship is planned for
- The training you will give them
- Their working conditions
- The qualifications they are working towards
- Employer's company rules and disciplinary procedures.

You can write your own apprentice agreement or download an apprenticeship agreement template, accessed at '<https://www.gov.uk/take-on-an-apprentice/apprenticeship-agreement>'.

5.1.5 Apprenticeship Training Agencies

You may use an apprenticeship training agency to find an apprentice to work for you. This means that you:

- Are not the apprentice's employer
- Can stop employing the apprentice more easily if you need to
- Pay a fee to the agency for the apprentice to work for you.

Apprenticeship training agency fees are usually the minimum wage for the apprentice plus a management fee. The agency supervises the apprentice's learning, including their training and assessment. If you end the apprenticeship early (for example, you can't afford to carry on employing the apprentice), the agency will find them another work placement. Contact the National Apprenticeship Service for more information on using an apprentice training agency (National Apprenticeship Service – Tel: 0800 015 0600).

5.2 Managing the Apprenticeship

The apprenticeship is a three-year period in which the apprentice will be focused on learning, training and qualification without deviating on to other activities, such as work or administration duties. Assuming you do not employ the apprentice through a training agency, you will need to manage the apprenticeship in the following manner.

5.2.1 Starting an Apprenticeship

In order to start an apprenticeship, you will need to comply with the following steps:

- Check the apprenticeships framework for an apprenticeship in your industry and at a suitable level
- Register your interest in employing an apprentice with the National Apprenticeship Service or simply follow your company's own procedures for recruiting new staff
- Find a training organisation that will manage apprenticeships for your industry – they will handle your apprentice's training, qualification and assessment
- Check your eligibility for a grant and apply (this grant refers to employing an apprentice between the ages of 16 and 18 years inclusive)
- Advertise your apprenticeship – your training organisation will do this for you through apprenticeship vacancies. You can track your vacancies by registering as an employer. You may also wish to advertise your apprenticeship on the BINDT website and/or in one of its publications
- After selecting your apprentice, make an apprenticeship agreement with them.

5.2.2 Identification of Key Personnel

Before the commencement of the apprenticeship there will be a need to identify and share contact details of key personnel. As a minimum, the list of key personnel will include:

- Employer's representative
- Lead provider's representative
- Independent assessment body's representative
- Professional body's representative
- Apprentice's mentor
- Apprentice's supervisor for on-the-job training
- Apprentice.

5.2.3 Initial Considerations

Before the apprentice begins the apprenticeship, you should fulfil the following requirements:

- Carry out company inductions, enrolments and processes
- Issue personal protective equipment (PPE)
- For each apprentice, apply for an apprenticeship start-up pack from the British Institute of NDT (the professional body), which will include:
 - Log book for supervised practice
 - Apprentices' guidance document
 - Engineering Council UK-SPEC
 - Information sheet: How to join BINDT as an Affiliate Member
 - Information sheet: How to register for online CPD
- Select a lead provider
- Through the lead provider, select an end-point assessment organisation
- Select three NDT methods, including at least one complex method
- Prepare an apprenticeship Gantt chart or work plan.

5.2.4 Ongoing Activities and Commitments

If some of the following requirements are difficult to achieve, particularly if you are an SME, then consult your lead provider and/or BINDT:

- Ensure that the apprentice has joined BINDT as an Affiliate Member
- Ensure that the apprentice registers for online CPD
- Facilitate courses and examinations throughout the apprenticeship
- Provide tuition to achieve English and maths qualifications, if required
- At six months, carry out the end of foundation stage review and impose a hold point if the review is not satisfactory
- At six months, set the apprentice an NDT project
- Carry out quarterly (three-monthly) appraisals and complete the appropriate check sheet (Appendix 17)
- Require corrective actions if the appraisals raise any non-compliance
- Three months before the end of the apprenticeship, determine that the apprentice has completed the NDT project and is on course to meet all other requirements stipulated in the NDT Engineering Technician standard
- At the end of the apprenticeship (three years), determine that the apprentice has prepared the NDT project presentation, has completed all of the requirements of the NDT Engineering Technician standard, has completed the log book of supervised practice, has collated the portfolio of evidence, has completed the EngTech competency matching form, has completed the apprenticeship completion certificate and has kept the online CPD up-to-date.

In a supportive way, you should also consider providing or facilitating:

- On-the-job coaching and learning
- Off-the-job learning
- Online learning and support
- Workbooks
- Mentoring and line management support
- Specific training for individuals.

5.2.5 Preparing for the End-Point Assessment

You need to ensure that the apprentice has completed the following list of activities and that all appropriate documents are sent to the independent assessment organisation:

- The apprentice has achieved all of the knowledge, skills and behaviours identified in the standard
- The apprentice has achieved a minimum of 70% in each module of the NDT Level 1 certification for the complex methods
- The apprentice has achieved a minimum of 70% for each module of three NDT Level 2 methods, including at least one complex method
- The apprentice has completed the UK-SPEC matching form
- The apprentice has completed the apprenticeship completion document
- The apprentice and supervisor for on-the-job training have completed the log book
- The apprentice has collated the portfolio of evidence.

6. The Mentor

A mentor is a friendly professional staff member who guides a less experienced person by building trust and modelling positive behaviours. An effective mentor understands that his or her role is to be dependable, engaged, authentic and tuned into the needs of the apprentice.

The concept of mentoring is simple, but successful implementation can be challenging. Characteristics of effective mentoring include the ability and willingness to:

- Value the apprentice as a person
- Develop mutual trust and respect
- Maintain confidentiality
- Listen both to what is being said and how it is being said
- Help the apprentice solve his or her own problem, rather than give direction
- Focus on the apprentice's development and resist the urge to produce a clone.

7. Training Organisation (Lead Provider)

A lead provider is an organisation that has been approved by the Skills Funding Agency (SFA). Lead providers will provide all apprenticeship training that their organisation can provide. They will also provide (sub-contract) other apprenticeship training that their organisations cannot provide. In the case of NDT training and certification (qualification), training providers must be approved as Approved Training Organisations (ATOs) for training or as Authorised Qualifying Bodies (AQBs) for certification (qualification) by the certification body. In the case of BS EN ISO 9712 and BS EN 4179, the certification body is the British Institute of Non-Destructive Testing.

Most employers work in partnership with lead providers to deliver their apprenticeship programme. If you so wish, a lead provider will help you:

- Identify the right apprenticeship for your business requirements
- Recruit an apprentice
- Develop a training plan that reflects the apprentice's and your needs
- Review and test the progress of an apprentice and provide feedback
- Provide training to support the apprentice with off-the-job learning and the knowledge elements of the programme.

A lead provider usually holds the apprenticeship delivery contract, which is managed by the Skills Funding Agency (SFA). When you embark on an apprenticeship for an apprentice or a number of apprentices, you must select a lead provider from the Register of Training Providers.

You can find the most suitable lead provider for your business by thinking about:

- Your business area and job role of the programme (and potential frameworks and levels)
- The size and scope of the programme (numbers, geography and age groups)
- Whether you will integrate your in-house training materials into the programme.

8. The Independent Assessment Organisation

A register of apprentice assessment organisations has been created for employers to select an independent assessment organisation. The following considerations apply to the use of the register:

- The register is a list of organisations that have been assessed as being suitable to conduct the independent end-point assessment of apprentices and be in receipt of public funds
- An apprentice is unable to complete and achieve an apprenticeship without taking and passing the end-point assessment
- Organisations can only be selected to undertake the independent end-point assessment of apprentices if they are listed on the register
- The register has been created to help employers
- Employers will use the register to select an organisation to undertake independent end-point assessment of apprentices
- Employers will determine the process for selection
- The lead training provider will then contact the end-point assessment organisation, on behalf of the employer
- The register is always open to new applications at the Bravo Solution portal
- Applicants to the register must be legal entities.

The independent assessment organisation will have had no involvement in the development of the apprentice. The end-point assessment will be conducted by two suitably qualified and trained interviewers (assessors). They will be Engineering Council registrants at or above the registration category in which the applicant is seeking registration and shall have substantial experience in non-destructive testing. The independent assessment organisation will take all reasonable steps in their selection of interviewers to ensure that potential conflicts of interest are avoided.

The independent assessment organisation will assess the apprentice's outcomes at the end of the apprenticeship by:

- Carrying out a portfolio of evidence assessment
- Reviewing a project showcase presentation by the apprentice on the NDT project outcomes
- Carrying out a synoptic assessment interview of all of the knowledge, skills and behaviour outcomes, including matching the outcomes to the UK-SPEC.

Every aspect of the standard is subject to scrutiny and questioning at the synoptic assessment interview, even though the apprentice may have passed examinations and received certificates during their apprenticeship.

Further details of the portfolio of evidence assessment, project showcase presentation and synoptic interview can be seen in the assessment plan.

After the documentation review, the project showcase presentation and the synoptic assessment interview, the independent assessment organisation will make a decision as to whether the apprentice has passed the apprenticeship (and is therefore EngTech ready) and, if so, whether to award a 'pass' or a 'distinction'. The criterion for awarding a 'pass' is to achieve an overall apprenticeship score of a minimum of 70% but less than 80%, whereas the criterion for awarding a distinction is to achieve an overall apprenticeship score of a minimum of 80%.

Note: Although an apprentice may have achieved a minimum score of 70% or 80%, there is also a mandatory requirement to achieve a minimum of 70% in each module of each NDT method attempted.

9. The Professional Body

The professional body for non-destructive testing (NDT), condition monitoring (CM), diagnostic engineering and all other materials and quality testing disciplines in the UK is the British Institute of Non-Destructive Testing (BINDT).

BINDT will offer support and advice to all those involved in NDT apprenticeship schemes, including the apprentice, the employer, the lead provider and the independent assessment body. Some useful email addresses are listed below.

Information and advice on:

Apprenticeships – apprenticeships@bindt.org

Website, CPD and publications – info@bindt.org

BINDT membership – membership@bindt.org

Training and certification – pcn@bindt.org

General advice – info@bindt.org

The contact telephone number for BINDT is: +44 (0)1604 438300.

BINDT will issue apprentices with an apprenticeship pack at the beginning of the apprenticeship.

10. External Quality Assurance

External quality assurance needs to be independent of those who lead on the design and the delivery of assessments. BINDT is in the process of proposing an NDT industry-led system that requires the setting up of an employer group from employers in the NDT industry sector. In the proposal we will be specific about who will quality assure the end-point assessment, how they will do it and our approach to ensuring quality of assessment over time and across different locations.

In addition to the external quality assurance arrangements, the independent assessment organisation needs to carry out internal audits to ensure that they are in compliance with the engineering technician standard and assessment plan.

11. Occupational Competence of Key Officers

It is recommended that anyone involved in the assessment of vocational achievement undergoes training. An example of this training is 'Level 3 Certificate in Assessing Vocational Achievement' (<http://thebigteacher.com/index.php/courses/assessor-courses/42-level-3-certificate-in-assessing-vocational-achievement>).

The assessors and advisors referred to in this section include:

- The independent assessment organisation interviewers (assessors)
- The professional body
- The lead providers
- The employer
- The mentor
- The supervisor of on-the-job training (supervised practice)

- Company internal audit assessors
- Independent assessment organisation internal audit assessors.

Assessment must be carried out by competent assessors that must have, as a minimum, demonstrable knowledge and experience of non-destructive testing or the technical module they are assessing.

Personnel and organisations involved in the engineering technician apprenticeship are: the independent assessment organisation, the professional institute, the employer, lead providers, the mentor, the supervisor of on-the-job training (supervised practice) and quality assurance assessors.

11.1 *Independent Assessment Organisations*

Independent assessment organisations interviewers (assessors) must be trained interviewers and have knowledge of NDT technical competence. This will be demonstrated by a relevant certificate of competence, technical qualification or by proven industrial experience of the technical areas to be assessed. Two assessors forming the judging panel will be registered with the Engineering Council at EngTech level or above. The assessors must include someone with the knowledge, skills and experience of the modules being undertaken by the apprentice.

Assessors must also be fully conversant with the independent assessment organisation's assessment recording documentation used for scoring the portfolio of evidence, the project showcase presentation and the synoptic interview, together with the UK-SPEC and any other relevant documentation.

11.2 *The Professional Body (BINDT)*

The professional institute is in a position to provide an extensive amount of information for further learning, online CPD, membership at affiliate grade and Engineering Council registration through its PEI committee. BINDT staff involved with the apprenticeship programme will be competent to offer advice and guidance.

11.3 *Lead Providers*

Lead providers must be on the SFA approved training provider database. Training organisations providing non-destructive testing (NDT) training and/or certification including employer-based training, must be approved by the professional institute (BINDT) as an ATO and, where applicable, as an AQB.

11.4 *Employers*

Employers must be familiar with quality plans, including Gantt charts (work plan), and the process by which you monitor progress and assign corrective actions. Employers must prepare an apprenticeship Gantt chart (work plan) that demonstrates how the apprentice will complete the apprenticeship in the given time. Employers must also provide resources and allocate time for on-site and off-site training.

11.5 *Mentors*

Mentors need not have any specific qualifications, the role requires more of a friendly face, being prepared to listen and to offer advice. It is advised that the mentor does not have any other role within the apprenticeship. It is also advised that the mentor undertakes a one-day mentor's training course.

11.6 *Supervisor of On-the-Job Training (Supervised Practice)*

The supervisor of on-the-job training must be certificated to a minimum of NDT Level 2 in the method they are supervising. The supervisor needs to confirm that the on-the-job training has been carried out in a correct manner and the hours booked against supervised practice is an accurate record.

Independent assessment organisations, employers and lead providers will use the Employer Units of Competence (EUCs) identified as Appendices 1 to 12 as a guide to knowledge and experience required by the competence. To avoid making this document overlong and unwieldy, the EUCs (Appendices 1 to 12) are filed as separate documents in the apprenticeship area of the BINDT website.

11.7 *Company Internal Audit*

Internal quality assurance (the internal audit) relates to measures put in place by the employer to verify that the processes and activities of the apprenticeship scheme are being carried out correctly and in a timely fashion.

An internal audit must be carried out by a competent auditor selected by the employer. The employer has overall responsibility for the internal audit.

11.8 *Independent Assessment Organisation Internal Audit Assessors*

An internal audit of the independent assessment organisation will be carried out by competent auditors.

The internal auditors of the independent assessment organisation must be independent of the part of the organisation carrying out the assessment of the apprentices.

Internal auditors will be expected to regularly review their skills, knowledge and understanding and, where applicable, undertake continuing professional development to ensure that they are carrying out workplace quality assurance (internal audit) of assessment processes and practices to the most up-to-date procedures and standards.

Internal auditors will be expected to be fully conversant with the terminology used in the employer units of competence, NDT documentation and the UK-SPEC, against which the assessments and audits are to be carried out.

12. Glossary

Apart from the acronyms mentioned in this document, other acronyms have been added to provide the reader with useful information they may come across when reading other NDT documentation.

AQB	Authorised qualifying body
ATO	Approved training organisation
BINDT	British Institute of Non-Destructive Testing
CAD	Computer-aided design
CCNSG	Client/Contractor National Safety Group
CEng	Engineering Council, Chartered Engineer registration grade
CPD	Continuing professional development
CSD	BINDT Certification Services Division
ECITB	Engineering Construction Industry Training Board
EngTech	Engineering Council, Engineering Technician registration grade
EngTech-ready	This describes the situation whereby the apprentice has fulfilled all of the requirements for EngTech registration, including passing the professional review interview
Gantt	An illustration of a project schedule that was devised by Henry Gantt in 1910
IEng	Engineering Council, Incorporated Engineer registration grade
IOSH	Institute of Occupational Safety and Health
NDT	Non-destructive testing
PEI	Professional engineering institute
SFA	Skills Funding Agency
UKAS	United Kingdom Accreditation Service
UK-SPEC	The UK Standard for Professional Engineering Competence

13. References

- Ref: 1** BS EN ISO 9712:2012 – Non-destructive testing – Qualification and certification of NDT personnel
- Ref: 2** BS EN 4179:2009 – Aerospace series – Qualification and approval of personnel for non-destructive testing
- Ref: 3** UK-SPEC – The UK Standard for Professional Engineering Competence
- Ref: 4** Non-Destructive Testing (NDT) – Engineering Technician Apprenticeship Standard
- Ref: 5** Non-Destructive Testing (NDT) – Engineering Technician Apprenticeship Assessment Plan
- Ref: 6** Apprentice’s Guidance document (located on the British Institute of NDT website at www.bindt.org)
- Ref: 7** On-Programme Competency Development document (located on the British Institute of NDT website at www.bindt.org)
- Ref: 8** Employer’s Units of Competence documents
- Ref: 9** BINDT and UK-SPEC codes of conduct

14. Appendices

- Appendix 1** Employer’s Units of Competence – Visual Testing NDT Level 2 (*see separate document*)
- Appendix 2** Employer’s Units of Competence – Penetrant Testing NDT Level 2 (*see separate document*)
- Appendix 3** Employer’s Units of Competence – Magnetic Particle Testing NDT Level 2 (*see separate document*)
- Appendix 4** Employer’s Units of Competence – Ultrasonic Testing NDT Level 2 (*see separate document*)
- Appendix 5** Employer’s Units of Competence – Radiographic Testing NDT Level 2 (*see separate document*)
- Appendix 6** Employer’s Units of Competence – Eddy Current Testing NDT Level 2 (*see separate document*)
- Appendix 7a** Employer’s Units of Competence – Thermography Testing (Passive) NDT Level 2 (*see separate document*)
- Appendix 7b** Employer’s Units of Competence – Thermography Testing (Active) NDT Level 2 (*see separate document*)
- Appendix 8** Employer’s Units of Competence – Behaviours (*see separate document*)
- Appendix 9** Employer’s Units of Competence – Product Technology (*see separate document*)
- Appendix 10** Employer’s Units of Competence – Health & Safety (*see separate document*)
- Appendix 11** Employer’s Units of Competence – Quality Assurance and Audit & Surveillance (*see separate document*)
- Appendix 12** Employer’s Units of Competence – Project Management with a focus on NDT (*see separate document*)
- Appendix 13** A Summary of NDT Methods
- Appendix 14** A List of other Technical and Safety Modules
- Appendix 15** Apprenticeship Completion Certificate
- Appendix 16** UK-SPEC Competency Matching Form – EngTech Registration
- Appendix 17** Employer’s Appraisal Checklist

Appendix 13

Description of NDT Methods

The apprentice will undertake safety-critical and complex training, both in a classroom environment and on-site, which will include NDT Level 2 training in a minimum of three methods and which will comprise at least one complex method (mandatory) and a choice of any two other methods. Each method is described briefly below:

- **Visual testing:** Visual inspection, with or without optical aids, is the original method of NDT. Many defects are surface-breaking and can be detected by careful direct visual inspection. Optical aids include low-power magnifiers, microscopes, telescopes and also specialised devices such as borescopes, endoscopes and other fibre-optic devices for the inspection of restricted-access areas. These devices can also be used with television camera systems. Much of the success of visual inspection depends on the surface condition and the lighting arrangements. Surface preparation such as cleaning and etching is often used.
- **Ultrasonic testing:** Ultrasonic methods of NDT use beams of mechanical waves (vibrations) of short wavelength and high frequency, transmitted from a small probe and detected by the same or other probes. Such mechanical waves can travel large distances in fine-grain metal, in the form of a divergent wave with progressive attenuation. The frequency is in the range from 0.1 to 20 MHz and the wavelength is in the range from 1 to 10 mm. The velocity depends on the material and is in the range from 1000-6000 m/s. The technique detects internal, hidden discontinuities that may be deep below the surface. Transducers and coupling wedges are available to generate waves of several types, including longitudinal, shear and surface waves. Applications range from thickness measurements of thin steel plate to internal testing of large turbine rotors.
- **Radiographic testing:** Radiography uses X-rays or gamma rays to produce an image of an object on film. The image is usually natural size. X-rays and gamma rays are very short wavelength electromagnetic radiation that can pass through solid material, being partly absorbed during transmission. Thus, if an X-ray source is placed on one side of a specimen and a photographic film on the other side, an image is obtained on the film of the thickness variations in the specimen, whether these are surface or internal. This is a well-established technique that gives a permanent record and is widely used to detect internal flaws in weldments and castings and to check for misconstructions in assemblies. The source of radiation is either an X-ray tube or a pellet of radioactive material emitting gamma radiation.
- **Eddy current testing:** In eddy current testing, a coil carrying an AC current is placed close to the specimen surface or around the specimen. The current in the coil generates circulating eddy currents in the specimen close to the surface and these in turn affect the current in the coil by mutual induction. Flaws and material variations in the specimen affect the strength of the eddy currents. The presence of flaws and so on is therefore measured by electrical changes in the exciting coil. Both voltage and phase changes can be measured, but some simpler instruments measure only the voltage changes. The strength of the eddy currents produced depends on the electrical conductivity of the specimen, the magnetic permeability (for a ferromagnetic specimen), the stand-off distance between the specimen and coil, the AC frequency used in the exciting coil and the dimensions of the coil and specimen.
- **Magnetic particle testing:** This method is used for the detection of surface and near-surface flaws in ferromagnetic materials and is primarily used for crack detection. The specimen is magnetised either locally or overall and, if the material is sound, the magnetic flux is predominantly inside the material. If, however, there is a surface-breaking flaw, the magnetic field is distorted, causing local magnetic flux leakage around the flaw. This leakage flux is displayed by covering the surface with very fine iron particles, applied either dry or suspended in a liquid. The particles accumulate at the regions of flux leakage, producing a build-up that can be seen visually, even when the crack opening is very narrow. Thus, a crack is indicated as a line of iron powder particles on the surface.

- **Penetrant testing:** This is a simple, low-cost method of detecting surface-breaking flaws such as cracks, laps, porosity, etc. To be detected, the flaw must reach the surface to be tested. Penetrant testing is one step up from visual inspection and offers many advantages, such as speed, large-area coverage and cheapness. It is usually a six-stage process:
 - surface cleaning (degreasing, etc)
 - application of a penetrant liquid (dipping, spray, brush)
 - removal of excess penetrant (solvent, water)
 - application of developer
 - inspection of the test surface (visual, television camera)
 - post-inspection cleaning (anti-corrosion solutions).

- **Infrared thermography testing:** Thermography is a technique of obtaining an image of the heat distribution over the surface of an object. The usual method is to use a special television camera with an infrared sensitive detector and a lens that transmits infrared radiation. Such cameras can operate at normal video rates. Temperature variations in the subject are then displayed as shades of grey or can be converted into a pseudo-colour image. Temperature variations as small as 0.1°C can be detected. The two main fields of application are:
 - to look at the heat distribution in hot specimens, such as furnace walls, insulated structures, electronic circuits, etc, in a steady-state – generally known as passive thermography;
 - to provide a pulsed source of heat on one side of a specimen and examine the other side for non-uniformities in infrared emission that would correspond to internal inhomogeneities or large flaws – generally known as active thermography.

Appendix 14

List of other Technical and Safety Modules

A list of other NDT modules and health & safety modules are listed below. This list is not exhaustive and provided that modules not listed are conceptually included in the standard, then they can be used as part of the requirement.

Technical

- Oxide thickness measurement
- Corrosion under insulation
- Detection of hydrogen cracking (induced cold cracking associated with welding)
- Detection of hydrogen cracking (associated with operating environments)
- Identification of dissimilar metals using XRF portable equipment
- Detection of delaminating bonded joints
- Critical defect sizing
- Introduction to time-of-flight diffraction (TOFD)
- Introduction to phased array
- Introduction to thermal imaging
- Product technology (materials, defects and failure mechanisms)
- Bolt/shaft testing – the effects of mode conversion
- Understanding of condition monitoring
- Introduction to welding processes
- Introduction to material science
- Introduction to materials replication
- Introduction to CAD
- Manufacturing with engineering materials
- Principles of solid mechanics and dynamics
- Engineering polymers and ceramics
- Materials selection, processes and failure investigation
- Project
- Management and individual project
- Microstructural engineering of materials
- Degradation and evaluation
- Level 3 certificate in assessing vocational achievement
- Hardness testing using portable equipment
- Remote visual testing using borescopes, video probes and other remote visual systems
- Effective communication and presentation skills
- Introduction to budgetary control

Health & Safety

- IOSH Managing Safely course
- Training in working at heights
- Training in confined space working
- Training in chemical handling
- Training in basic electrical safety
- Training in manual handling of objects
- Preparing risk assessments
- Preparing method statements
- Training in machinery safety
- First aid training
- Rope access training
- Working in a nuclear environment
- Defensive driving
- Basic radiation safety
- Safety awareness of using hazardous NDT consumables
- Personal Track Safety (PTS)

Appendix 15

Apprenticeship Completion Checklist

Apprentice/Apprenticeship details		
Apprentice's name:		
Apprentice's employer:		
Apprentice's PCN or EN 4179 number:		
BINDT membership number:		
Apprenticeship standard title:		
Apprenticeship assessment plan title:		
Date apprenticeship commenced:		
Date apprenticeship finished:		
Statement	Answer Yes/No	Supporting details – Where to find the evidence
I have completed all three NDT methods and passed all examinations		
I have learned all of the knowledge requirements identified in the standard		
I have acquired all of the skills requirements identified in the standard		
I have acquired all of the behaviours requirements identified in the standard		
I have fully completed the log book		
I have collated my portfolio of evidence		
I have completed my UK-SPEC matching form		
I have kept my CPD online up-to-date		
I have completed my project report		
I have prepared my project showcase presentation		
I have conformed to the BINDT and the UK-SPEC codes of conduct		
I am ready for my end-point assessment		
Apprentice name:	Date:	Signature:
Employer:	Date:	Signature:

Appendix 16

UK-SPEC Competency Matching Form for EngTech Registration

<p>The Competence and Commitment Standard for Engineering Technicians.</p> <p><i>Engineering technicians must be competent throughout their working life, by virtue of their education, training and experience, to:</i></p>	<p>The examples given below are intended to help you identify activities you might quote to demonstrate the required competence and commitment for EngTech registration. These are not exhaustive. Moreover, you are not required to give multiple examples to demonstrate competence and commitment.</p> <p><i>Tell us about your career, education and training. Explain how the experience you have gained has made you more competent.</i></p>	<p>Fill in the boxes below with your own self-assessment.</p>
<p>A Use engineering knowledge and understanding to apply technical and practical skills.</p> <p><i>This includes the ability to:</i></p>	<p>The reviewers will be looking for evidence that you have the know-how to do the job and were able to go beyond the immediate requirements and use your initiative and experience to solve a problem or improve a process.</p>	
<p>A1 Review and select appropriate techniques, procedures and methods to undertake tasks.</p>	<p>Describe:</p> <ul style="list-style-type: none"> ■ an example of work you did that went well, the choices you made and the outcome ■ or something in your work that you were involved in which didn't quite work and explain why ■ or a technique, procedure or method you improved upon and explain why. 	
<p>A2 Use appropriate scientific, technical or engineering principles.</p>	<p>Drawing from your direct experience, this might be an explanation of how a piece of equipment, system or mechanism works.</p>	
<p>B Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems or services.</p> <p><i>In this context, this includes the ability to:</i></p>	<p>Explain how you contribute to one or more of these activities.</p>	
<p>B1 Identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions.</p>	<p>Show an example of how you have used measurement, monitoring and assessment to:</p> <ul style="list-style-type: none"> ■ identify the source of a problem ■ or to identify an opportunity ■ or to propose a solution. 	

<p>B2 Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact.</p>	<p>Illustrate how you make decisions about:</p> <ul style="list-style-type: none"> ■ what information, material, component, people or plant to use ■ or how to introduce a new method of working ■ or what precautions you took. <p>Describe how you have contributed to best practice methods of continuous improvement, for example ISO 9000.</p>	
<p>C Accept and exercise personal responsibility.</p> <p><i>This includes the ability to:</i></p>	<p>Describe an experience or instance where you have had to accept personal responsibility for seeing a process through to completion within agreed targets.</p>	
<p>C1 Work reliably and effectively without close supervision, to the appropriate codes of practice.</p>	<p>Your evidence should show how you identified and agreed what had to be done and to what standards on a typical project.</p>	
<p>C2 Accept responsibility for the work of self or others.</p>	<p>Your evidence could include: minutes of meetings; site notes and instructions; variation orders; programmes of work; specifications, drawing and reports; or appraisals.</p>	
<p>C3 Accept, allocate and supervise technical and other tasks.</p>	<p>Activity not associated with your job can contribute to evidence.</p>	
<p>D Use effective communication and interpersonal skills.</p> <p><i>This includes the ability to:</i></p>	<p>You will need to show you can: contribute to discussions; make a presentation; read and synthesise information; or write different types of documents.</p>	
<p>D1 Use oral, written and electronic methods for the communication in English of technical and other information.</p>	<p>Your evidence could include: letters; reports; drawings; emails; minutes, including of progress meetings; appraisals; work instructions; and other task planning and organising documents. Your application itself will be relevant.</p>	
<p>D2 Work effectively with colleagues, clients, suppliers or the public, and be aware of the needs and concerns of others, especially where related to diversity and equality.</p>	<p>Show examples of how this has occurred and your role at the time. Describe your role as part of a team. Describe a situation where you put your awareness into practice.</p>	
<p>E Make a personal commitment to an appropriate code of professional conduct, recognising obligations to society, the profession and the environment.</p>	<p>Your commitment will be to become part of the profession and uphold the standards to which all members subscribe. You need to show that you have read and understood your institution's code of conduct.</p>	
<p>E1 Comply with the code of conduct of your institution.</p>	<p>The professional review involves demonstration of, or discussion of, your position on typical ethical challenges.</p>	

<p>E2 Manage and apply safe systems of work.</p>	<p>Provide evidence of applying current safety requirements, such as risk assessment and other examples of good practice you adopt in your work. You will need to show that you have received a formal safety instruction relating to your workplace (such as a CSCS safety test in the UK), or an update on statutory regulations. In the UK an example would be COSHH requirements.</p>	
<p>E3 Undertake engineering work in a way that contributes to sustainable development. <i>This could include an ability to:</i></p> <ul style="list-style-type: none"> ■ Operate and act responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously. 	<p>Show examples of methodical assessment of risk in specific projects; actions taken to minimise risk to society or the environment.</p>	
<p>E4 Carry out and record CPD necessary to maintain and enhance competence in own area of practice, including:</p> <ul style="list-style-type: none"> ■ Undertake reviews of own development needs ■ Plan how to meet personal and organisational objectives ■ Carry out planned (and unplanned) CPD activities ■ Maintain evidence of competence development ■ Evaluate CPD outcomes against any plans made ■ Assist others with their own CPD. 	<p>This means demonstrating that you have actively sought to keep yourself up-to-date, perhaps by studying new standards or techniques, or made use of magazines, lectures organised by professional engineering institutions and other opportunities to network in order to keep abreast of change.</p>	
<p>E5 Exercise responsibilities in an ethical manner.</p>	<p>Give an example of where you have applied ethical principles as described in the statement of ethical principles on page 33 of the UK-SPEC. Give an example of where you have applied/upheld ethical principles as defined by your organisation or company, which may be in its company or brand values.</p>	

Appendix 17

Employer's Appraisal Checklist

Apprentice being appraised:		
Question	Answer Yes/No	Comment
<i>Is this the:</i>		
3 month appraisal?		
6 month appraisal (hold point)?		
9 to 33 month appraisal?		If Yes, please specify:
End of apprenticeship appraisal?		
Is the apprentice making satisfactory progress with the three NDT methods?		
Is the apprentice making satisfactory progress attaining technical knowledge?		
Is the apprentice making satisfactory progress acquiring the skills?		
Is the apprentice making satisfactory progress understanding and demonstrating the behaviours?		
Is the apprentice making satisfactory progress attaining knowledge of health & safety?		
Is the apprentice's progress at the right point on the Gantt chart?		
Is the apprentice's log book up-to-date?		
Is the apprentice maintaining a CPD record online?		
Please record any other comments you wish to make:		
Employer's name:		
Employer's company:		
Date:		
Signature:		

Notes

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