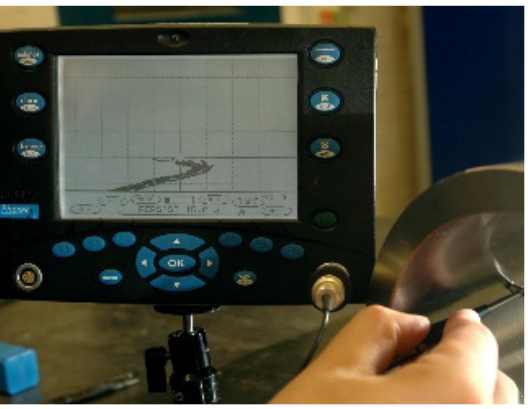
Non-Destructive Testing (NDT) Engineer Level 6 Apprenticeship – **On-Programme Competency Development**

Apprenticeships

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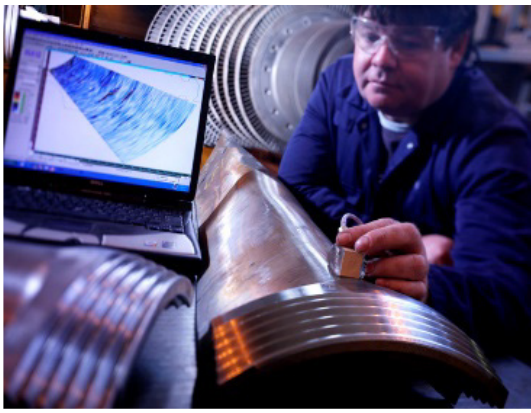
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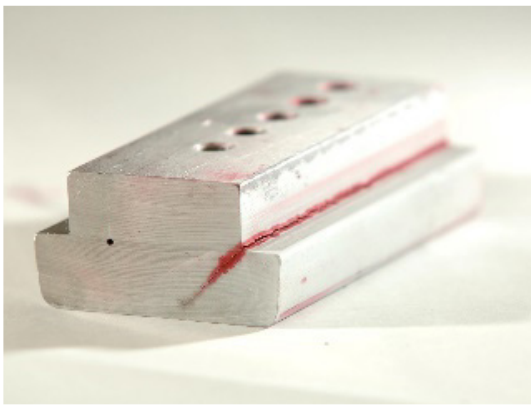
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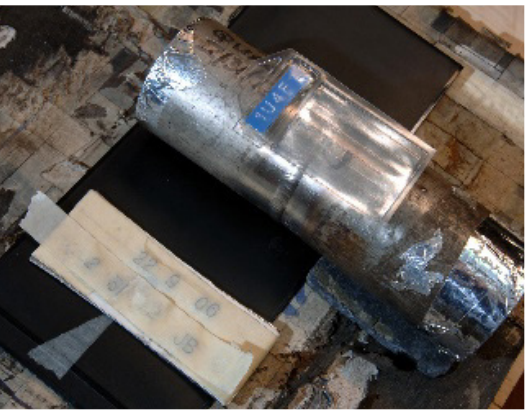
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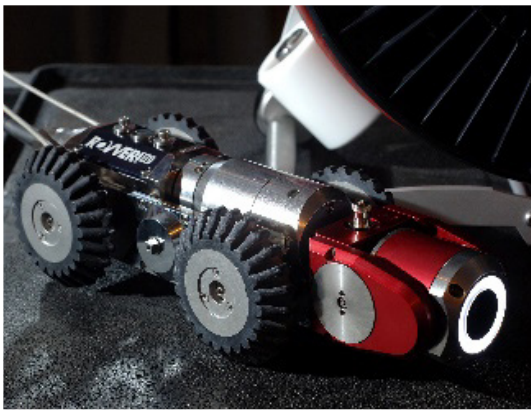
Assessment











Requirements and responsibilities for all those involved in the Non-Destructive Testing (NDT) Engineer Level 6 Degree Apprenticeship

Supported by lead employer

Rolls-Royce

BINDT THE BRITISH INSTITUTE OF NON-DESTRUCTIVE TESTING

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Overview of the Apprenticeship Scheme – Schematic



Onboarding and induction	On-programme	Gateway	Assessment
Carried out by the apprenticeship provider and the employer.	Apprentice carries out their studies and competency development with the provider and in the workplace.	Apprentice completes their portfolio of evidence, which is signed-off by the employer and provider.	End-point assessment with a registered End-Point Assessment Organisation (EPAO).

Onboarding and induction	On-programme	Gateway	Assessment
■ Submit documents for assessment of suitability and stage. ■ Carry out a Skills Scan. ■ Join BINDT as an Affiliate Member. ■ Register for a CPD online record. ■ Undergo company inductions. ■ Prepare a log book of supervised practice. ■ Establish a portfolio for collating evidence.	■ Study modules of degree programme (BEng or BSc). ■ Undergo company training and certification as appropriate. ■ Attend regular tripartite reviews and employer appraisals. ■ Undertake additional training and reflection as advised by the provider. ■ Develop evidence of knowledge skills and behaviours. ■ Propose and carry out an NDT technology project.	■ Complete academic programme – award of degree. ■ Complete evidence of knowledge skills and behaviours. ■ Fulfil mandatory requirements on functional skills. ■ Prepare portfolio and project presentation.	■ End-point assessment review of portfolio of evidence. ■ Presentation of the NDT project by the apprentice. ■ Synoptic interview, which will include questions on all aspects of the apprenticeship stipulated in the standard.

1. Introduction

This document explains the rationale for the development of the Non-Destructive Testing (NDT) Engineer Level 6 Degree Apprenticeship (Ref 1). It describes how the scheme has been developed and, most importantly, it defines the responsibilities for those participating in the scheme.

NDT is used by engineers to detect defects in materials and structures, either during manufacturing or while in service. The NDT Engineer Level 6 Degree Apprenticeship programme covers fundamental and advanced methods during an academic degree programme, including a work-based project assessed at honours-degree level. Knowledge, skills and behaviour for the NDT Engineer Level 6 Degree Apprenticeship are matched at IEng level according to the UK-SPEC for engineering registration by the Engineering Council (Ref 2).

The NDT Engineer Level 6 Degree Apprenticeship is listed on the government's apprenticeship web pages at: https://findapprenticeshiptraining.apprenticeships.education.gov.uk/courses/207

2. Apprenticeship Rationale – Level 6 NDT Engineer

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 in NDT 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 directly and a study (Ref 3) suggested there was a 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. This resulted in a narrow focus of training in just the basic NDT skills, without considering the wider context in which an NDT engineer would become far more competent if they benefitted from wider engineering knowledge, health & safety training and behavioural skills.

The NDT apprenticeship scheme seeks to address this by:

- Setting a high standard, which includes wide-ranging engineering, health & safety and behaviour knowledge and skills;
- Offering considerable assistance with funding for training; and
- Providing incentives for taking prospective apprentices straight from school at the age of 18+ or upskilling experienced NDT inspectors to become NDT engineers.

NDT engineers exist in large organisations and very often in small- and medium-sized enterprises (SMEs); they are the lead authority for NDT competence within their organisation. The NDT engineer works in specific industries, such as nuclear, aerospace, motorsport, power generation and distribution, manufacturing, railways, oil & gas (on- and offshore), marine and construction. Real-life examples could include inspecting airframes and engines, Formula 1 gearboxes and nuclear reactors or other safety-critical components.

NDT engineers are among the most senior NDT staff within an organisation and are often responsible for the oversight of all NDT operations, including the preparation of work plans and NDT procedures for other staff to work in accordance with. NDT engineers use their acquired knowledge, skills and behaviours to enable NDT systems to operate safely, efficiently and in an environmentally-sustainable way, meeting the requirements set out by the employer and the professional body.

NDT engineers maintain and manage applications of current and developing technology and undertake engineering design and development within manufacturing, construction and operations. NDT engineers demonstrate theoretical knowledge to solve problems in developed technologies using well-proven analytical techniques and successfully apply their knowledge to deliver engineering projects or services using established technologies and methods. They provide financial planning and management, together with taking some responsibility for leading and developing other professional staff. Their knowledge and skills will include cutting-edge NDT techniques, such as corrosion analysis, thermographic testing, vibration analysis and advanced inspection techniques.

Individual employers will set their own selection criteria for the NDT engineer apprentices. Typically, candidates will either have achieved grades A-C in three A-levels, including maths and a science or engineering subject, or hold a minimum of three NDT Level 2 methods, including at least one complex method, defined as ultrasonic, radiography, eddy current, shearography, vibration analysis, acoustic emission, oil analysis or thermography, or will hold advanced NDT qualifications, such as NDT Level 3 certification. Other relevant qualifications may be considered as an alternative.

On completion of the apprenticeship, the NDT engineer will hold a degree (BSc Non-Destructive Testing or BEng Non-Destructive Testing). Apprentices will need to achieve Level 2 English and maths prior to taking their end-point assessment (this is usually an entry requirement for joining the programme).

3. Apprenticeship Standard and Assessment Plan

The apprenticeship is defined by the Apprenticeship Standard and the Assessment Plan. The management of the apprentice's learning during their apprenticeship follows from these documents, in order to achieve the required outcomes.

3.1 NDT Engineer Level 6 Degree Apprenticeship Standard

The NDT Engineer Level 6 Degree Apprenticeship Standard is a mandatory concept document that has been approved by the Institute for Apprenticeships and Technical Education (ifATE) and recognised by the Department for Education (DfE). 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 level of competence required for the NDT Engineer Level 6 Degree Apprenticeship has been matched to the Engineering Council's IEng standard given in UK-SPEC (Ref 2).

The Standard for the NDT Engineer Level 6 Degree Apprenticeship can be found at (Ref 4): www.instituteforapprenticeships.org/apprenticeship-standards/non-destructive-testing-engineer-degree-v1-0

The NDT Engineer Level 6 Degree Apprenticeship was established by a development group, which included 40 to 50 leaders in the NDT industry. It is periodically reviewed by a similar group, including representatives from IfATE.

3.2 NDT Engineer Level 6 Degree Apprenticeship Assessment Plan

The NDT Assessment Plan is also an approved mandatory document. The assessment plan details 'what', 'by whom' and 'how' the apprentice will be assessed. The Assessment Plan for the NDT Engineer Level 6 Degree Apprenticeship can be found at (Ref 5): www.instituteforapprenticeships.org/media/2466/st0369_ndt-engineer_l6_ap-for-publication_19112018.pdf

The end-point assessment for the NDT engineer consists of two parts – the project and its presentation, and the interview. The pass mark is set at 60% for the EPA itself (both parts), plus at least a pass in the degree. A distinction for the apprenticeship is awarded for 80% for the EPA, plus a first class in the degree. Prior to the EPA, the End Point Assessment Organisation (EPAO) carries out a document review to assess the portfolio of evidence (for example, course attendance, test results, examination results, certificates and employer's reports), log book of experience, project report, Continuing Professional Development (CPD) compliance and anything else that is germane to the success of the apprenticeship.

- A project presentation by the apprentice on their NDT project.
- An end-point interview covering technical considerations not covered by the project showcase presentation, health & safety and behaviours, assessed according to the Standard at IEng level.

3.3 Managing the Apprenticeship

Unlike the Standard and the Assessment Plan, managing the apprentice throughout the apprenticeship is not documented elsewhere but must be developed by the apprenticeship provider and carried out through tripartite arrangements between the apprenticeship provider, the employer and the apprentice. Within this document, guidance is given on management of the apprentice through the apprenticeship, focusing on on-programme competency development according to the requirements of the Standard and the Assessment Plan.

4. Apprentice's Responsibilities

4.1 Preparation

A liate membership of BINDT – The apprentice should register online with BINDT as an Affiliate Member (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 have access to an online copy of the Institute's monthly journal *Insight* and the monthly newsletter *NDT News*. Being an Affiliate Member of BINDT is highly recommended.

CPD – At the same time as registering online to become an Affiliate Member of BINDT, the apprentice should also take advantage of free provisions for the online recording, secure storage, access and review of their personal CPD activities, via separate registration, in order 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 and demonstrates their commitment to personal development as required under the Level 6 NDT Engineer Standard.

Log book – Although NDT certification is not mandated under the Level 6 NDT Engineer Standard, it is necessary for the apprentice to keep an up-to-date log book of supervised and structured NDT experience and development at the appropriate level in order to demonstrate their continuous engagement with NDT technologies, processes, procedures and personnel throughout the apprenticeship. The log book should be updated at reasonable intervals and counter-signed by a supervisor, mentor or manager.

Evidence portfolio – The apprentice must maintain an evidence portfolio for collating attendance certificates, examination results and other documents. Maintaining a portfolio of evidence is a mandatory requirement.

Engineering Council documentation – The apprentice needs to be familiar with the requirements for IEng under The UK Standard for Professional Engineering Competence (UK-SPEC) (Ref 2) because the NDT Engineer Level 6 Degree Apprenticeship is matched at IEng level.

Codes of Conduct – The apprentice must understand and conform to the BINDT and Engineering Council Codes of Conduct. The PCN (or other certification) Code of Conduct may also apply (Ref 6).

Employer's Units of Competence – The purpose of the Employer's Units of Competence is to provide guidance on competency requirements for the NDT apprentice and can be found on the BINDT website (Ref 7). Relevant to the Level 6 NDT Engineer are the following: organisational health, safety and environment (HSE) requirements; management of human factors (behaviours); project management with a focus on NDT; quality assurance, audit and surveillance of NDT and related activities; online provision covering materials and manufacturing processes in NDT has been developed by BINDT and contributes evidence of partial attainment of knowledge statements 1 and 5 in the Apprenticeship Standard (Ref 8).

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 include key elements of training during the apprenticeship. The work plan can be flexible and modifiable and should include experience hours required for any NDT certifications taking place during the apprenticeship period in order to evidence achievement of specific knowledge, skills or behaviours listed within the Apprenticeship Standard.

4.2 Onboarding and Induction

The apprentice will submit a CV, personal statement and supporting documents at the beginning of the apprenticeship. They will also carry out a Skills Scan to assess their current level according to the NDT Engineer Standard.

An apprentice who is a new recruit will also be involved in company employment processes, such as inductions, registrations, issue of documentation and issue of personal protective equipment (PPE).

The apprentice's learning plan will be developed by the apprenticeship provider and agreed by the employer and the apprentice.

4.3 On-Programme Stage

The On-Programme Stage is typically 3-4 years. The apprentice studies a BEng (Hons) or BSc (Hons) NDT degree programme, which they must be awarded before moving to the Gateway Stage and the end-point assessment. During the final year, the apprentice will carry out a project in the workplace, assessed by the university, which forms part of their portfolio sent to the EPAO and contributes to their presentation to the EPA panel.

During the On-Programme Stage, the apprentice must acquire sufficient knowledge and skills and develop behaviours to meet the requirements of the NDT engineer standard.

4.3.1 Knowledge and Skills

Occupational Knowledge:

According to the Level 6 Apprenticeship Standard, NDT engineers have knowledge of:

- Material properties, electronic principles, mathematics and technical project management;
- Advanced NDT, condition monitoring (CM), structural health monitoring (SHM) and quality management;
- Commercial awareness and the economics of their industry sector, business improvement and project and business management techniques relevant to the engineering industry;
- Regulatory and international standards requirements, technology, safety and the environment;
- The interaction between NDT and other engineering functions, the consequences of failure and the contribution of NDT to asset management and life extension;
- Applying design processes, including materials selection that meet NDT standards;
- Root cause analysis and learning from experience (LFE) processes; and
- The advantages of collaboration with other industry sectors in order to apply best practice.

Occupational Skills:

According to the Level 6 Apprenticeship Standard, NDT engineers:

- Have advanced skills in NDT methods substantiating their lead competency role within their organisation and industry sector, and work in all industry sectors, such as nuclear or aerospace;
- Critically apply knowledge of the concepts, principles and theories of developing engineering technology relevant to the interdisciplinary fields of NDT;
- Work competently in a technical engineering environment, understanding and promoting personal responsibility for health, safety, radiation protection, environmental protection, quality, security, safeguards and principles of risk management;
- Analyse engineering problems, selecting and using mathematical and theoretical data to provide suitable NDT solutions with consideration of the entire inspection cycle;
- Apply their engineering knowledge to the development, operation, maintenance and progression of technologies used for NDT;
- Observe, record and draw conclusions from data and experimental evidence, recognising inherent uncertainties and limitations;
- Develop technical reports that meet the requirements of the prevailing verification process;
- Apply the standards and procedures for NDT as required by the industry sector; and
- Develop and manage projects and contribute to financial planning, including some responsibility for the management and development of others.

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

Although NDT certification is not mandated under the Level 6 NDT Engineer Standard, holding and maintenance of NDT certification is an important demonstration of the knowledge, skills and behaviours in the Standard and an essential vocational qualification for NDT practitioners.

In the case of certification, experience is mandatory and is defined in the related national and international standards as 'supervised practice'. The person carrying out the supervision will ideally be certificated or, in certain cases, may not be certificated but is someone who, in the opinion of BINDT, possesses the knowledge, skill and experience to properly perform such supervision.

4.3.3 Behaviours

The apprentice needs to demonstrate appropriate behaviours, such as communication, technical speaking to a scientific/engineering audience, reliability, integrity and respect for confidentiality, compliance with professional codes of conduct and ethical principles, impact of diversity and equality, personal development, personal safety behaviour, following rules, procedures and principles, attention to detail and verification, and an understanding the impact of human factors with respect to NDT.

According to the Level 6 Apprenticeship Standard, NDT engineers will:

- Communicate effectively and appropriately using a full range of skills: technical speaking to a scientific/ engineering audience, active listening, professional writing and technical presentation;
- Demonstrate reliability, integrity and respect for confidentiality regarding work and personal matters in accordance with professional codes of conduct and ethical principles;
- Understand the impact of work on others, especially where related to diversity and equality;
- Take responsibility for personal development, demonstrating commitment to learning and self-improvement and be open to feedback;
- Demonstrate a strong commitment to personal safety behaviours and understanding of the consequences as set out in the industry sector requirements; and
- Demonstrate compliance by following rules, procedures and principles to ensure work completed is fit for purpose, paying attention to detail and carrying out verification checks throughout work activities.

Behaviours will be assessed in the workplace by the employer and by the EPAO. A form is available on the BINDT website, which can be used for employer assessment of behaviours (Ref 9).

4.3.4 NDT Project

The NDT Project will be a start-to-finish project that requires the apprentice to carry out some research and either lead, or provide a significant technical contribution to, a multi-disciplined team in addressing a problem that has been identified in the workplace and primarily requires an NDT solution. The project will take place during the on-programme period, will last up to 12 months and will be tested by the project presentation.

The proposed project might be the introduction of a new NDT technique (that is, new to this problem) or the comparison of two or more different techniques to see which one is better in terms of accuracy, reliability, cost or time. The NDT project should include as many knowledge and skills requirements identified in the standard as reasonably practicable.

On successful completion of the project, the apprentice should be able to demonstrate that they can:

(a) Complete a self-managed project within a timescale to an agreed professional standard;

(b) Critically analyse a problem from the fields of non-destructive technologies using appropriate problem-solving tools;

(c) Design and develop a solution to a problem from the fields of NDT, CM or SHM;

(d) Critically assess and take into account the needs of any end-users or clients;

(e) Select and critically evaluate reading material or designs that are relevant to the project;

(f) Collect and critically evaluate data using various NDT techniques and determine its suitability for interpretation;

(g) Critically evaluate available technical alternatives and innovative solutions in the project relevant to the requirements and constraints of quality standards;

(h) Work within international standards, written specifications and inspection procedures;

(i) Clearly document the project activities and the outcomes;

(j) Develop awareness and skills in modern computing technologies and inspection techniques;

(k) Evaluate data, present results and write reports;

(l) Develop design and analysis skills;

(m) Organise own learning, making full use of appropriate sources of information;

(n Develop and practise written and oral presentation skills; and

(o) Seek and make use of feedback from the project supervisor.

The project presentation will help to establish the elements of the Apprenticeship Standard that have been completed and which requisite knowledge and skills have been achieved.

4.3.5 Activities to be Carried Out at the End of the On-Programme Phase

- Complete the project and prepare the project report;
- Create a project presentation (normally PowerPoint) to present to the end-point assessment panel. The project presentation will demonstrate how the apprentice has achieved many of the knowledge, skills and behaviours identified in the Apprenticeship Standard and potentially the competencies required for Engineering Council IEng registration;
- Assemble the portfolio of evidence, which will include, but not be limited to: degree results, the project report, training records, examination results notices, certificates of competence, certificates of attendance, log book of experience and any other useful information about achievements during the apprenticeship; and
- Complete the Engineering Council UK-SPEC IEng competency matching form.

4.4 Preparing for the End-Point Assessment

Once the apprentice has completed the apprenticeship, they or the apprenticeship provider should send the portfolio of evidence and the Employer's Gateway Letter (Ref 10) to the EPAO. Please refer to the checklist in the Assessment Plan (Ref 5) for all of the documents needed in the portfolio. Once the portfolio of evidence has been received, the EPAO will offer an assessment date to the apprentice.

The format of the end-point assessment will be:

- A review of the portfolio of evidence (apprentice not present);
- A project presentation by the apprentice; and
- A synoptic interview, which will cover all aspects of the apprenticeship not covered by the project presentation, the knowledge, skills and behaviour requirements identified in the Standard, CPD and competency matching to IEng level of UK-SPEC.

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. Please refer to the UK Government website for full information at: www.gov.uk/employing-an-apprentice

5.1 Pay and Conditions for Apprentices

Requirements for pay and conditions for apprentices can be found on the UK Government website at: www.gov.uk/employing-an-apprentice/pay-and-conditions-for-apprentices

5.1.1 Paying the Apprentice

You must pay apprentices at a rate commensurate with a person progressing towards meeting the responsibilities that are ultimately expected to be met in any subsequent appointment or role, with sensible comparison with established rates for undergraduates nationally.

5.1.2 Conditions

Apprentices must work towards an approved apprenticeship. They must be employed in a real job that gives them the opportunity to gain the appropriate knowledge and skills required in a middle management technical role and capable of delivering the required knowledge, skills, behaviours and competence required of the standard and need to pass their formative and summative assessments during on-programme development and the end-point assessment.

You must pay your apprentice for time spent training or studying for their apprenticeship. Apprentices must get time off during their working week for apprenticeship training.

The training might take place:

- At their place of work;
- Somewhere else (for example, a college or training provider); or
- Online.

If an apprentice is also studying for English or maths qualifications required by their apprenticeship, they are entitled to paid study time during their normal working hours.

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; and
- Any support you offer, for example coaching or mentoring.

5.1.3 Apprentices and Redundancy

Apprentices have the same employment rights as other employees. If you have to make an apprentice redundant, follow the same process used for making staff redundant. Seek legal advice if you want to end the apprenticeship early for another reason.

Your apprentice can get support if they are being made redundant or are at risk of redundancy by contacting the DfE Apprenticeships and Skills Helpline (Tel: +44 (0)800 015 0400, Monday to Friday, 8.00 am to 8.00 pm). Here, they can get:

- Financial and legal advice;
- Support for their health and wellbeing; and
- Help finding another apprenticeship.

5.1.4 Apprenticeship Agreement

You must sign an apprenticeship agreement with your apprentice.

This provides details of:

- The skill, trade or occupation the apprentice is being trained for;
- The name of the apprenticeship they are working towards;
- The start and end dates for the apprenticeship; and
- The amount of training you will give them.

You must sign a training plan with your apprentice and the training provider.

It must include:

- The planned content and schedule for training;
- What is expected and offered by the employer, the training provider and the apprentice;
- How to resolve queries or complaints; and
- If the apprentice has relevant experience.

Your apprentice could spend less time training or qualify earlier if they have relevant experience. The training provider will tell you which it will be, depending on how the training is delivered.

If the amount of training is reduced, you must agree this with both the training provider and the apprentice during the initial assessment.

5.2 Managing the Apprenticeship

The apprenticeship covers a 3-4 year period, during which the apprentice will focus on learning, training and qualification. Follow the relevant apprenticeship funding rules to ensure compliance with the definitions of on- and off-the-job training. See: www.gov.uk/guidance/apprenticeship-funding-rules

Employers will need to manage the apprenticeship in the following manner:

5.2.1 Employing an Apprentice

In order to employ an apprentice, look at the most recent government guidance provided by the DfE at: www.gov.uk/guidance/how-to-take-on-an-apprentice

In summary, you will need to take the following steps:

- Check the apprenticeships framework for an apprenticeship in your industry and at a suitable level;
- Register with the apprentice service;
- Find a training provider that will manage apprenticeships for your industry – they will handle your apprentice's training, qualification and assessment;
- Advertise your apprenticeship – the employer or training provider can do this through the apprentice service. You may also wish to advertise your apprenticeship on the BINDT website and/or in one of its publications; and
- After selecting your apprentice, make an apprenticeship agreement with them. Incentive payments are awarded to employers and training providers taking on an apprentice who is aged 16 to 18 years old, or aged 19 to 25 years old and has an education, health and care (EHC) plan or has been in the care of their local authority.

5.2.2 Identi□cation 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:

- Apprentice;
- Employer representative;
- Lead provider representative;
- EPAO representative;
- Professional body's representative;
- Mentor; and
- Apprentice supervisor for on-the-job training.

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 PPE;
- For each apprentice, obtain relevant downloadable files from the following sources:
  - The BINDT website (the professional body) at: www.bindt.org
    - *Education and Training/apprenticeships/apprenticeship document download:* Form AA080 – Template for the recording of supervised activities relevant to the apprenticeship; form AA211 – Employer's Assessment of behaviours – Form/template for the recording of periodic assessment of behaviours; and selective use of the 17 NDT Apprenticeship guidance documents.
    - *Membership/for individuals/downloads*: Membership application form (Affiliate, Associate, Member grades) – add training/CPD record to the application form in order to automatically create an online CPD record that may be accessed/edited/augmented via MyBINDT/MyCareer upon becoming a member.
  - The Engineering Council website at: www.engc.org.uk
    - Engineering Council UK-SPEC for IEng level.

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 apprenticeship 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;
- Carry out regular appraisals and engage with tripartite meetings with the apprentice and provider;
- Require corrective actions if the appraisals or tripartite meetings raise any non-compliance;
- At the end of the apprenticeship, determine that the apprentice is on course to meet the requirements stipulated in the Level 6 NDT Engineer Standard; and
- At the end of the on-programme delivery phase of the apprenticeship, determine if the criteria for achieving Gateway through to the EPA process has been met, including evidence that the apprentice has: prepared the project presentation; completed all of the requirements of the NDT Engineer Standard; completed the log book of supervised practice; collated the portfolio of evidence; completed the Employer's Gateway Letter (Ref 10); and has kept their 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; and
- 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:

- Achieved all of the knowledge, skills and behaviours identified in the standard;
- Completed the IEng Competency Matching Form (Ref 11);
- Completed the Employer's Gateway Letter (Ref 10);
- The apprentice and the supervisor have completed the log book for on-the-job training;
- The apprentice has collated the portfolio of evidence.

6. The Mentor

A mentor is a staff member at the employer's organisation who guides a less experienced person by building trust and modelling positive behaviours. An effective mentor understands that their role is to be dependable, engaged, authentic and tuned into the needs of the apprentice. A mentor/coach is separate to a line manager and is someone who provides a support system for the apprentice. They can help your apprentice resolve issues quickly when they do not feel comfortable talking to their line manager. See: www.apprenticeships.gov.uk/employers/supporting-your-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 to both what is being said and how it is being said;
- Help the apprentice solve their own problem, rather than give direction; and
- Focus on the apprentice's development and resist the urge to produce a clone.

7. Apprenticeship Provider

The Apprentice Provider and Assessment Register (APAR) lists the organisations approved by the DfE to offer the services of apprenticeship provider. See: https://download.apprenticeships.education.gov.uk/apar

Apprenticeship providers will offer all of the 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 qualifications, training providers must be approved as Approved Training Organisations (ATOs) for training or as Authorised Qualifying Bodies (AQBs) for examinations, potentially leading to certification by the Certification Body. In the case of BS EN ISO 9712 (Ref 12) and BS EN 4179 (Ref 13), the Certification Body is the British Institute of Non-Destructive Testing.

Most employers work in partnership with apprenticeship providers to deliver their apprenticeship programme. If you so wish, an apprenticeship 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; and
- Provide training to support the apprentice with off-the-job learning and the knowledge elements of the programme.

An apprenticeship provider usually holds the apprenticeship delivery contract, which is managed by the Education and Skills Funding Agency (ESFA). You must select an apprenticeship provider from the APAR register of eligible providers.

You can find the most suitable apprenticeship provider and apprentice programme for your business by thinking about:

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

8. The End-Point Assessment Organisation

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 have substantial experience in NDT. The EPAO will take all reasonable steps in their selection of interviewers to ensure that potential conflicts of interest are avoided.

The EPAO 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; and
- Carrying out a synoptic assessment interview of all of the knowledge, skills and behaviour outcomes.

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 found in the Assessment Plan.

After the documentation review, the project showcase presentation and the synoptic assessment interview, the EPAO assessors will make a decision as to whether the apprentice has passed the apprenticeship and the level of the award.

9. The Professional Body

The professional body for NDT, CM, diagnostic engineering and all other materials and quality testing disciplines in the UK is BINDT.

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

- 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.

10. External Quality Assurance

External quality assurance must be independent of those who lead on the design and the delivery of assessments. At the current time, the designated provider of external quality assurance is Ofqual. All EPAOs must be approved by Ofqual for the Level 6 NDT Engineer apprenticeship.

In addition to the external quality assurance arrangements, the EPAO needs to carry out internal audits to ensure that they are in compliance with the IEng standard and the NDT Engineer Assessment Plan.

Apprenticeship providers are overseen by Ofsted, which carries out regular inspections.

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 the 'Level 3 Certificate in Assessing Vocational Achievement'. See: www.ncfe.org.uk/qualification-search/qualification-detail/ncfe-level-3-certificate-in-assessing-vocational-achievement-515

The assessors and advisors referred to in this section include: EPAO interviewers (assessors); professional body; apprenticeship/training provider(s); employer; mentor; supervisor of on-the-job training (supervised practice); company internal audit assessors; and EPAO internal audit assessors.

The assessment must be carried out by competent assessors that must have, as a minimum, demonstrable knowledge and experience of NDT or the technical module they are assessing.

Personnel and organisations involved in the apprenticeship are: the EPAO, the professional engineering institute (PEI), the employer, apprenticeship/training providers, the mentor, the supervisor of on-the-job training (supervised practice) and quality assurance assessors.

11.1 End-Point Assessment Organisation

EPAO 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 IEng level or above.

Assessors must also be fully conversant with the EPAO'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 membership and qualification, education and professional development committees and the Engineering Council Working Group. BINDT staff involved in the apprenticeship programme will be competent to offer advice and guidance in these aspects.

11.3 Apprenticeship Providers

Apprenticeship providers must be on the DfE-approved APAR. See: https://download.apprenticeships.education.gov.uk/apar

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- and off-the-job training.

11.5 Mentors

Mentors need not have any specific qualifications, although mentoring training courses are widely available.

11.6 Supervisor for 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 the correct manner and that the hours booked against supervised practice is an accurate record.

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 End-Point Assessment Organisation's Internal Audit Assessors

An internal audit of the EPAO will be carried out by competent auditors. The internal auditors of the EPAO 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 CPD 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 UK-SPEC, against which the assessments and audits are to be carried out.

12. Glossary

In addition to 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 Department
DfE	Department for Education
ECITB	Engineering Construction Industry Training Board

EngTech	Engineering Council, Engineering Technician registration grade
Gantt Chart	An illustration of a project schedule that was devised by Henry Gantt in 1910
IEng	Engineering Council, Incorporated Engineer registration grade
IEng-ready	This describes the situation whereby the apprentice has reached the standard for IEng registration, which they will demonstrate by passing the professional review interview
IOSH	Institute of Occupational Safety and Health
NDT	Non-destructive testing
PEI	Professional engineering institute
UKAS	United Kingdom Accreditation Service
UK-SPEC	The UK Standard for Professional Engineering Competence

13. References

Ref: 1 Non-Destructive Testing (NDT) – NDT Engineer Apprenticeship Standard. Available at: www.bindt.org/education-and-training/Apprenticeships/ndt-engineer-apprenticeship

Ref: 2 UK-SPEC – The UK Standard for Professional Engineering Competence and commitment, Fourth edition, Engineering Council. Available at: www.engc.org.uk/ukspec4th

Ref: 3 A Landscape for the Future of NDT in the UK Economy, BINDT-KTN, 2014. Available at: www.bindt.org/downloads/Materials-KTN-Future-of-NDT-in-UK-economy.pdf

Ref: 4 Non-Destructive Testing Engineer (Degree), IfATE. Available at: www.instituteforapprenticeships.org/apprenticeship-standards/non-destructive-testing-engineer-degree-v1-0

Ref: 5 NDT Engineer Assessment Plan (non-integrated BSc Non-Destructive Testing or BEng Non-Destructive Testing). Available at: www.instituteforapprenticeships.org/media/2466/st0369_ndt-engineer_l6_ap-for-publication_19112018.pdf

Ref: 6 BINDT Statement of Ethical Principles and Code of Conduct. Available at: www.bindt.org/membership/for-individuals/statement-of-ethical-principles-and-code-of-conduct

Ref: 7 BINDT Employer's Unit of Competence series. Available at: www.bindt.org/education-and-training/Apprenticeships/apprenticeship-document-download

Ref: 8 Product Technology for NDT Technicians, BINDT/Wilkinson Coutts. This publication provides broad general knowledge that augments the sector-specific product technology. Available at: www.bindt.org/Certification/product-technology-online-training

Ref: 9 Form AA211 – Non-Destructive Testing (NDT) Apprenticeships – Employer's Assessment of Behaviours. Available at: www.bindt.org/education-and-training/Apprenticeships/apprenticeship-document-download

Ref: 10 Form AA203 – Non-Destructive Testing (NDT) Apprenticeships – Employer's Gateway Letter Pro Forma. Available at: www.bindt.org/education-and-training/Apprenticeships/apprenticeship-document-download

Ref: 11 Form AA253 – Non-Destructive Testing (NDT) Engineer – UK-SPEC Competency Matching Form. Available at: www.bindt.org/education-and-training/Apprenticeships/apprenticeship-document-download

Ref: 12 BS EN ISO 9712:2022 Non-destructive testing – Qualification and certification of NDT personnel.

Ref: 13 BS EN 4179:2021 Aerospace series – Qualification and approval of personnel for non-destructive testing.

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