Non-Destructive Technologies Technician – **Guidance for the Observational End-Point Assessment Interview**

Apprenticeships

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BINDT
THE BRITISH INSTITUTE OF NON-DESTRUCTIVE TESTING

1. Preface

The apprenticeship end-point assessment (EPA) is a process that brings together an apprentice, who has achieved all of the requirements for gateway, and the qualified assessors to assess the extent to which that apprentice has gained the specific knowledge, skills, behaviours and other overall characteristics that the apprenticeship was designed to deliver.

Process

- Prior to the meeting:
  - Independent review of portfolio of evidence by two assessors.
- At the meeting:
  - Observational end-point assessment interview (OEPAI) of the apprentice by the assessors (75 minutes), to include: asking preset questions directed at the seven themes described in the Apprenticeship Standard, covering planning and preparation for, activity in, analysis of and reaction to the execution of non-destructive technologies and the resulting information that is collected and reported from such tests or measurements (the apprentice can refer to their portfolio of evidence in their answers); and evidence of having achieved each of the 30 knowledge items, 22 skill items and five behaviours listed in the standard.

The time allowed for the EPA/assessment is half a day independent and remote for each assessor to review the portfolio of evidence, followed by 75 minutes' remote contact via a mutually convenient meetings platform, such as Zoom or Teams, in order to facilitate the interview. The questions are provided to the assessors randomly from BINDT's question bank by the Quality Manager. These are of a generic nature; however, follow-up questions will be guided by the contents of the portfolio.

The interview will be conducted by two people who are registered with the Engineering Council as Incorporated Engineers (IEng) or Chartered Engineers (CEng), have been trained as interviewers, have undergone annual refresher training, have observed two EPA interviews and have extensive knowledge of non-destructive testing (NDT). Before the process commences, one of the assessors will be designated as the Lead Assessor and, in the case of a split decision, the Lead Assessor will have the casting vote.

2. Portfolio of Evidence

The Independent Assessment Organisation assessors will, in the days before the OEPAI, review but not assess the portfolio of evidence provided by the apprentice and use it to prompt specific questions during the OEPAI as appropriate. At this stage, the assessors will utilise the checklist in Appendix 1 and may request additional information and/or evidence from the apprentice or the apprenticeship provider.

The portfolio of evidence will include certificates of competence, letters of approval, results notices, training attendance certificates, a log book of on-the-job training (experience), employer appraisal reports and the employer's apprenticeship completion form. It may also include technical reports, procedures, videos or other evidence of the apprentice's work. What the assessors are looking for is evidence that the apprentice has undergone formal and on-the-job training that demonstrates that the apprentice has acquired the knowledge, skills and behaviours (KSBs) identified in the Apprenticeship Standard. To avoid the assessors having to cross-reference another document, the KSB requirements detailed in the Apprenticeship Standard are listed below.

If the Independent Assessment Organisation assessors are satisfied with the overall evidence, they will inform the Membership and Registration Manager, who will arrange the OEPAI date.

The Requirements Detailed in the Apprenticeship Standard are:

Themes:

1. Planning work and project management (K2, K3, K9, K11, K14, K19, S3, S8, S9).
2. Health, safety and sustainability (K6, K8, S6, S7).
3. Tools, equipment and materials (K15, K20, K21, S10).
4. Quality assurance and continuous improvement (K10, K13, K23, S4, S15, B3).
5. Team working, leadership and communication (K1, K24, K25, K26, K27, S17, S18, S20, B4).
6. Digital and information technology (K29, S21).
7. Continuing professional development (CPD) (K30, S22, B5).

Knowledge and Understanding of:

K1. The NDT engineering function and the role of the Non-Destructive Technologies Technician. Limits of autonomy and reporting channels.

K2. Planning, organising, workflow and time management techniques.

K3. Principles of identifying, organising and using resources and how they impact cost, quality, safety, security and the environment.

K4. Principles of planning, preparing for and applying inspections, tests and monitoring on materials, products, plant or machinery using non-destructive technology.

K5. Contextual information: purpose and requirements prior to applying non-destructive technology on specific products, plant or machinery relevant to the specific industry.

K6. Health & safety regulations, relevance to the occupation and the Technician's responsibilities; Health and Safety at Work Act – responsibilities; Control of Substances Hazardous to Health (COSHH); Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR); manual handling; types of hazard; near-miss reporting; due diligence; personal protective equipment (PPE); situational awareness; slips, trips and falls; working in confined spaces; working at height; lone working; electrical safety and compliance; noise regulation; legionella; display screen equipment; ionising and non-ionising radiations (IRR19); and electromagnetic radiation.

K7. Risk assessments and safe systems of working.

K8. Environment and sustainability regulations and guidance relevance to the occupation and the Technician's responsibilities; Environmental Protection Act; types of pollution and control measures (noise, smells, spills and waste); sustainability; efficient use of resources; environmental permits; waste management; Waste Electrical and Electronic Equipment (WEEE) Directive; recyclable materials and waste disposal procedures; and net-zero commitment.

K9. Project management techniques and phases: project planning and execution to completion, costs, budgets, resources, quality, safety, security and the environment.

K10. Quality assurance: awareness of quality management standards policy, principles and practices, relevance to the occupation and the Technician's responsibilities.

K11. Mathematical techniques and scientific and engineering principles: calculations using formulae, ratios, SI units and trigonometry.

K12. International and national standards for engineering representations, drawings, graphical information and datasets.

K13. Technological development and innovation in the engineering sector; Industry 4.0; and IT networking, new materials and artificial intelligence (AI).

K14. Inspection, test or monitoring procedures applicable to the non-destructive technology: what they are and how to prepare and utilise them.

K15. Techniques and processes for maintenance and storage of tools, materials and equipment.

K16. Techniques and processes for selecting, configuring, operating and using tools and equipment.

K17. National and international standards applicable to the test or monitoring method: ISO 17359, EN 4179, ISO BS EN 16810 or BS EN 15495:2007.

K18. Non-destructive technologies: methods and techniques.

K19. Principles of collecting and analysing information and reporting on the application of NDT methods and techniques on equipment, parts, assemblies and subassemblies.

K20. Materials science: material types, manufacturing processes, in-service conditions, defect types, defect mechanisms and growth rates.

K21. Component, equipment and material failure: consequences and risks to life and the environment.

K22. Types, uses and limitations of non-destructive technology tests for analysis and measurements.

K23. Continuous improvement principles and techniques.

K24. Team-working principles.

K25. Supervisory techniques and principles: leading and motivating, performance evaluation, mentoring, delegating and solving routine daily problems.

K26. Equality Act; equity, diversity and inclusion (EDI) in the workplace; and unconscious bias.

K27. Verbal communication techniques: matching style to audience; barriers in communication and how to overcome them; and NDT engineering terminology.

K28. Written communication techniques: report writing, data collection and presentation and image acquisition.

K29. Digital and information technology: Management Information Systems (MISs), spreadsheets, presentation, word processing, email, virtual communication and learning platforms; awareness of General Data Protection Regulation (GDPR); and cyber security.

K30. Workplace training and development activities: CPD.

Skills and Practical Application:

S1. Identify, organise and use resources to complete inspections, tests or monitoring on materials, products, plant or machinery for the non-destructive technology.

S2. Plan, prepare for and apply inspections, tests or monitoring on materials, products, plants or machinery using non-destructive technology.

S3. Use project management techniques throughout project phases, for example project justification, planning, analysis, execution and conclusions.

S4. Implement quality control procedures.

S5. Comply with health & safety regulations and procedures and apply safe systems of work.

S6. Identify and document risks and hazards in the workplace and advise on and apply control measures.

S7. Comply with environmental and sustainability regulations and procedures; segregate resources for re-use, recycling and disposal of waste; use resources efficiently; and apply sustainability principles.

S8. Read and interpret engineering drawings, for example weld or component configuration.

S9. Identify and report on the progress of work and issues or concerns with the non-destructive technology method.

S10. Apply maintenance practices and techniques for tools, materials and equipment, for example clean/lubricate/replace parts.

S11. Select, configure, use and operate tools and equipment.

S12. Apply and review inspection and monitoring procedures.

S13. Perform non-destructive technology methods in line with national and international standards applicable to the test or monitoring method, for example ISO 17359, EN 4179 and ISO BS EN 16810.

S14. Apply non-destructive technology methods and techniques, for example vibration analysis, ultrasonics, radiography, thermography and eddy current.

S15. Identify problems and apply analytical tools to identify causes and solutions, for example root cause analysis. Review the effectiveness of methods deployed, actions and results.

S16. Collect and interpret technical or analytical information or datasets from performed non-destructive technology tests.

S17. Apply team-working principles, including providing information, guidance or training to colleagues or stakeholders.

S18. Apply equity, diversity and inclusion procedures.

S19. Write technical reports.

S20. Communicate verbally with colleagues and stakeholders.

S21. Use information technology, for example for document creation, communication and information management; comply with GDPR and cyber security.

S22. Carry out and record learning and development activities.

Behaviours:

B1. Prioritise and promote health & safety.

B2. Take responsibility for work.

B3. Adapt to changing work demands.

B4. Collaborate within teams, across disciplines and with external stakeholders, supporting social inclusion in the workplace.

B5. Show commitment to CPD.

The above themes are key aspects of NDT employment and the employer will be key to providing the opportunity for apprentices to engage in those activities at their place of work. That, along with advice from the NDT apprenticeship provider, will facilitate and direct the apprentice's journey through an apprenticeship that the professional body (BINDT) and industry representatives have designed, in order to deliver the necessary knowledge, skills, behaviours and attributes that will assure competent performance in those activities.

Many of the KSBs are captured in the delivery of mandatory qualifications in the form of recognised vocational qualifications and certification attesting to the individual's ability to conduct non-destructive technology methods and techniques to a prescribed level independent of any direct supervision. There is a mandatory requirement within these qualifications to obtain a pass mark of 70% for each of four separate examination elements for each of the three NDT methods undertaken. Note that the third method must be a so-called 'complex' method and the examination for this follows after the OEPAI.

Failure to achieve 70% in any examination element(s) in the case of initial examination and in the one permitted resit opportunity for the affected examination element(s) for any one or more of the NDT methods undertaken will result in failing the apprenticeship.

Failure to provide evidence that this has been achieved via a BINDT Approved Training Organisation and Approved Qualifying Body will result in delaying the achievement of the gateway requirements and admission to the EPA process. The evidence that is required is the 'results notice', which provides percentage scores for each examination element of each NDT method.

In addition to the results notice and in order to fully achieve the mandatory qualifications for the first two methods in order to meet the gateway requirements, there is a requirement to obtain a period of on-the-job training (supervised practice) for each method in accordance with Table 1. In the case of the third (complex) method, a small proportion of the overall experience requirement to achieve certification may be outstanding beyond the gateway but must be secured and evidenced by the date of the OEPAI.

Table 1. Experience days required for the Level 2 NDT and Category 2 condition monitoring methods as part of the apprenticeship

NDT method	Training/experience days
Simple methods	
Magnetic particle testing (MT)	60
Penetrant testing (PT)	60
Visual testing (VT)	60
CM lubrication management and analysis (field)	730
CM lubrication management and analysis (laboratory)	730
Complex methods	
Eddy current testing (ET)	180
Radiographic testing (RT)	180
Thermographic testing (TT)	180
Ultrasonic testing (UT)	180
Acoustic emission Category 2	365
Alternating current field measurement (ACFM)	180
CM infrared thermography Category 2	730
CM ultrasound Category 2	365
CM vibration analysis Category 2	550
PCN or CSWIP Level 2 – Welding inspector	1080
Phased array ultrasonic testing (PAUT)	225
Time-of-flight diffraction (TOFD)	225

3. Observational End-Point Assessment Interview

To ensure that all aspects of the apprenticeship end-point assessment are adequately covered, Appendix 2 of this document details these requirements.

Column 1 in Table 3 contains the seven themes outlined in the Non-Destructive Technologies Technician Apprenticeship Standard, Issue 3.

Column 2 in Table 3, though not exhaustive, contains example descriptors provided in the Non-Destructive Technologies Technician Apprenticeship Standard, Issue 3.

Column 3 in Table 3 facilitates the recording of specific notable evidence items and the apprentice's response to the question posed by the assessors covering the theme in point.

Columns 3, 4 and 5 of Table 4 facilitate the recording of the grade assigned against each descriptor within a theme following a discussion between the two assessors, that shall include a direct comparison of their individual notes against each descriptor in column 3 of Table 3 and any subsequent moderation thereof, in order to reach an agreed grade against each descriptor wherever possible. In the event of any unresolvable difference, the Lead Assessor shall have the final casting vote.

4. Final Analysis

Once the review of the portfolio of evidence and the observational end-point assessment interview is complete, the assessors will discuss and agree the outcome of the apprenticeship and collate all documents to form a quality pack that will demonstrate due process.

The overall result for the apprenticeship EPA is then determined by the following rules:

- A 'fail' grade on any row of Table 4 results in a 'fail' result for the apprenticeship.
- A 'distinction' grade on all rows of Table 4, where a distinction result is possible, results in a 'distinction' result.
- Any combination of pass and distinction grades on all rows of Table 4, where a distinction result is possible, results in a 'pass' result.

5. Resits

If, at the end of the assessment process, the assessors determine that the apprentice has not met the required competency standard, the apprentice assessment organisation will inform the apprentice and the apprenticeship provider, which in turn will discuss with the employer any opportunity for the apprentice to resit parts of the knowledge, skills and behaviours requirements within an extended apprenticeship.

NOTE: *while the NDT qualification examination has its own rules regarding resitting NDT modules, only one resit for each examination element will be allowed within the apprenticeship programme.*

6. Notifications

The responsibility for informing the apprentice or the apprenticeship provider rests with BINDT as the acting End-Point Assessment Organisation (EPAO). BINDT will not notify either of those parties on the day of the assessment, as the documentation has to undergo internal quality checks, but will endeavour to notify those parties within seven working days.

7. References

1. Templates (all templates are available to assessors on the BINDT website at www.bindt.org).
2. NDT Technician Apprenticeship Standard. The master copy is on the government website (www.gov.uk), with a duplicate identical version available on the BINDT website (www.bindt.org).
3. NDT Technician Assessment Plan. The master copy is available on the government website (www.gov.uk), with a duplicate identical version available on the BINDT website (www.bindt.org).
4. Apprentice and employer guidance documents are accessible on the apprentice document download page of the BINDT website (www.bindt.org/education-and-training/apprenticeships/apprenticeship-document-download).
5. BS EN ISO 9712:2022 – Non-destructive testing – Qualification and certification of NDT personnel.
6. BS EN 4179:2021 – Aerospace series – Qualification and approval of personnel for non-destructive testing.

Appendix 1 – Portfolio of Evidence Checklist (ST0288 V1.1 Level 3 Non-Destructive Technologies Technician)

Table 2. Portfolio of evidence checklist

Employer details	
Apprentice details (name and ID)	
Record of Level 2 English and maths (optional)	
Record of NDT training and certification (two methods)	
Record of experience in a third (complex) NDT method	
Record of health & safety training and certification	
Record of behaviours training and certification	
Record of employer's continuous assessment	
Photo ID (for example a copy of PCN card or driving licence)	
Up-to-date CV	
Record of CPD	
Training – Other than the above (optional)	
Certification – Other than the above, certification gained during the apprenticeship (optional)	
Other items (for example videos, technical reports, presentations, GANTT charts and minutes)	
EngTech competency matching form (optional)	
Checked by: (Assessor name and date)	

Appendix 2 – OEPAI Marking Templates

Table 3. Record of notes taken during the observational end-point assessment interview

Theme	Descriptors covered	Notes
Planning work and project management	Use of project management tools	
	Use of engineering drawings, maths and scientific and engineering principles	
	Identify issues and report on progress	
Health, safety and sustainability	Identify risks and hazards and apply control measures	
	Apply sustainability principles	
Tools, equipment and materials	Maintenance of tools and equipment	
	Knowledge of materials and defect types	
	Consequences of failure	
Quality assurance and continuous improvement	Identify causes of problems and solutions	
	Respond to changing work demands	
	Explain the impact of new technology, IT, AI, etc	
Team working, leadership and communication	Understand the role, limits of autonomy and reporting channels	
	Benefits of team working, EDI and collaboration across disciplines	
	Communicate with colleagues and stakeholders at all levels	
Digital and information technology	Use of digital and information technology in the role	
Continuing professional development	Carrying out and recording CPD and development activities	

Table 4. Record of grades allocated against descriptors during the observational end-point assessment interview

Theme	Descriptors covered	Fail	Pass	Distinction
Planning work and project management	Use of project management tools	☐	☐	☐
	Use of engineering drawings, maths and scientific and engineering principles	☐	☐	☐
	Identify issues and report on progress	☐	☐	☐
Health, safety and sustainability	Identify risks and hazards and apply control measures	☐	☐	☐
	Apply sustainability principles	☐	☐	☐
Tools, equipment and materials	Maintenance of tools and equipment	☐	☐	☐
	Knowledge of materials and defect types	☐	☐	☐
	Consequences of failure	☐	☐	☐
Quality assurance and continuous improvement	Identify causes of problems and solutions	☐	☐	☐
	Respond to changing work demands	☐	☐	☐
	Explain the impact of new technology, IT, AI, etc	☐	☐	☐
Team working, leadership and communication	Understand the role, limits of autonomy and reporting channels	☐	☐	☐
	Benefits of team working, EDI and collaboration across disciplines	☐	☐	☐
	Communicate with colleagues and stakeholders at all levels	☐	☐	☐
Digital and information technology*	Use of digital and information technology in the role	☐	☐	N/A
Continuing professional development*	Carrying out and recording CPD and development activities	☐	☐	N/A
	OVERALL RESULT:	☐	☐	☐

**No distinction is available for these themes.*

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