Non-Destructive Testing (NDT) Operator – **Assessor's Guidance and Score Sheets**

Apprenticeships

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1. Guidance

The apprentice will be scored against knowledge, skills and behaviours gained throughout the apprenticeship, presented in the project presentation and the observational end-point interview (professional discussion). The review of the portfolio of evidence and achievements, including the log book of experience, results, end-of-course tests, certificates and the employer's reports produced during the apprenticeship, will be tested during the observational interview (professional discussion). Tables 1 and 2 provide the scoring principles and mechanism derived from the assessment plan.

1.1 Allocation of scores across the apprenticeship

Table 1 gives the knowledge, skills and behaviours listed in the assessment plan, which have been converted and allocated to Engineering Council Professional Review Interview (PRI) categories and requirements. There is a red line around the 'core knowledge and skills – NDT' modules, which means there is a mandatory minimum requirement that has to be met in order to pass through the gateway. Table 2 demonstrates how the Engineering Council PRI and the apprenticeship end-point assessment (project presentation and professional discussion) are merged together as one entity but achieve the outcomes required by each process.

1.2 Key requirements to pass through the gateway

Although the scoring of other knowledge, skills and behaviours can be flexed in a holistic approach to the end-point assessment, there are minimum requirements (red lines), which include the core NDT knowledge and skills that have to be met in order to pass through the gateway. Apprentices will not be allowed to progress to the end-point assessment unless they have achieved specific requirements, which include a minimum of 70% in all 'core knowledge and skills – NDT' modules. It is stressed that this requirement applies to all modules of the NDT examination. Table 3 gives examples of four outcomes that do or do not meet the requirements of 'pass' or 'distinction'. Other red lines exist, which are listed in the 'Guidance on the Preparation of the Portfolio of Evidence' document.

To avoid any doubt as to whether the apprentice has passed the 'core knowledge and skills – NDT' modules, the assessors should refer to the '**results notice**' and the '**NDT certificate**' or '**letter of approval'**, which will be included in the portfolio of evidence. The 'results notice' and the 'NDT certificate' or 'letter of approval' will determine whether the candidate has passed the NDT method and, if so, whether it is a '**pass**' or a '**distinction**'.

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2. Scoring the Apprenticeship

There are four separate processes used to determine whether the NDT Operator apprentice has achieved Engineering Council registration and passed the apprenticeship with either a 'pass' or a 'distinction'. These are:

- Review of the portfolio of evidence, enabling access through the gateway (not scored)
- The NDT project presentation, followed by a question and answer session
- Observational end-point interview, supported by the portfolio of evidence
- Engineering Council PRI – EngTech level.

Note: The observational end-point interview and the Engineering Council Professional Registration Interview will be consolidated into one interview.

The assessment of the apprentice should be holistic, that is to say dealing with or treating the whole of the apprenticeship outcome, dealing with the higher-order categories that have been achieved as a result of achieving the lower-order subcategories, rather than dealing with individual parts. It follows, therefore, that by achieving the 'core knowledge and skills – NDT' the apprentice must demonstrate the ability to carry out calibrations and the interpretation of indications. The holistic approach is explained by the following example:

- In 'Behaviours and human factors', the apprentice has scored low in the 'delivery' and 'communication' subcategories
- In 'Behaviours and human factors', the apprentice has been exemplary in the 'Teamwork' and 'Ethics' subcategories
- The average across the 'Behaviours and human factors' main category is above that required by a 'pass' or a 'distinction'
- The apprentice has been successful in the 'Behaviours and human factors' category.

It follows, therefore, that if the apprentice has fallen short in one area of the apprenticeship but has performed better than required in another part of the apprenticeship, then the assessors have the flexibility to make a positive judgement. This is a reflection of what happens in the Engineering Council Registration PRI, where, for example, the apprentice has scored 1 in each of the subcategories E2, E3 and E5 but has achieved the required mean block score of 1.5 or 1.75.

The requirements of 'knowledge, skills and behaviours', stipulated in the apprenticeship standard, have been embedded in the 'Notes Taken During the Project Presentation and the Observational End-Point Assessment Interview/Engineering Council PRI', which have been included in this document as Appendix 3.

The combined 'Apprenticeship End-Point Assessment and Engineering Council PRI – EngTech' (scores derived from notes taken during interview) are included as Appendix 1.

The apprenticeship outcome recommendation form is included as Appendix 2.

Table 1. Scores derived from the Assessment Plan, which have also been converted into Engineering Council PRI categories and requirements

Knowledge and skillsets	Processes	Scores derived from the Assessment Plan	NDT Level 2 Skills	
			Pass ≥70%	Distinction ≥80%
Core knowledge and skills – NDT	NDT Project Showcase – presentation of NDT project Observational end-point assessment interview informed by portfolio of evidence and achievements	The Table in Section H of the Assessment Plan shows the minimum percentages required and the maximum percentages achievable for the apprenticeship. The apprenticeship has been developed to meet the requirements of Engineering Council EngTech registration, so both the apprenticeship and the Engineering Council registration can be scored at the same time. The apprenticeship is scored in a holistic manner that fits in to the PRI scoring system, which allows for low minimums for individual competencies, such E1, E2 and E3, etc, but requires a minimum mean block score of 1.5.	A minimum of 70% must be achieved in each module of the NDT method. **Mandatory** **PRI** A1 and A2 Score ≥2 each	An average of ≥80% must be achieved across all modules of the NDT method. **PRI** A1 and A2 Score ≥2.5 each
Other knowledge and skills, including H&S	NDT product showcase – presentation of NDT project Observational end-point assessment interview informed by portfolio of evidence and achievements		In addition to the scores for A1 and A2, an average holistic block mean score of 1.5 in B to E provides the necessary total for a **pass**. Apprenticeship 'Other knowledge and skills and H&S' fit into **PRI** B1, B2, E1, E2, E3, E4 and E5	In addition to the scores for A1 and A2, an average holistic block mean score of 1.75 in B to E provides the necessary totals for a **distinction**. Apprenticeship 'Other knowledge and skills and H&S' fit into **PRI** B1, B2, E1, E2, E3, E4 and E5
Behaviours and human factors	NDT product showcase – presentation of NDT project Observational end-point assessment interview informed by portfolio of evidence and achievements		Apprenticeship 'Behaviours and human factors' fit into **PRI** C1, C2, C3, D1 and D2	Apprenticeship 'Behaviours and human factors' fit into **PRI** C1, C2, C3, D1 and D2
		Totals	**≥PRI 22 out of 42**	**≥PRI 26 out of 42**

Table 2. Demonstration of how the Engineering Council PRI and the apprenticeship end-point assessment are merged together as one entity but achieve the outcomes required by each module

	PRI scores						Apprenticeship scores		
	Individual scores		Average block mean score		Total block scores		Weighting applied to total block scores	Pass	Distinction
	Pass	Distinction	Pass	Distinction	Pass	Distinction			
A1	≥2	≥2.5	2	2.5	≥4	≥5	3.15	≥12.6	≥15.75
A2	≥2	≥2.5							
B1	>0	>0	1.5	1.75	≥3	≥3.5	3.15	≥9.45	≥11.025
B2	>0	>0							
C1	>0	>0	1.5	1.75	≥4.5	≥5.25	3.15	≥14.175	≥16.5375
C2	>0	>0							
C3	>0	>0							
D1	>0	>0	1.5	1.75	≥3	≥3.5	3.15	≥9.45	≥11.025
D2	>0	>0							
E1	>0	>0	1.5	1.75	≥7.5	≥8.75	3.15	≥23.625	≥27.5625
E2	>0	>0							
E3	>0	>0							
E4	>0	>0							
E5	>0	>0							
							Total scores	**≥69.3**	**≥81.9**
							Rounded total scores	**≥70**	**≥80**

Table 3. Examples of four outcomes of the 'core knowledge and skills – NDT' modules

Main category	Subcategory	Actual score	Outcome
Core knowledge and skills – NDT	General theory	71%	**Pass** (pass)
	Specific theory	82%	
	Practical	73%	
Core knowledge and skills – NDT	General theory	84%	**Distinction** (pass)
	Specific theory	81%	
	Practical	90%	
Core knowledge and skills – NDT	General theory	76%	**Distinction** (pass)
	Specific theory	81%	
	Practical	86%	
Core knowledge and skills – NDT	General theory	74%	**Fail**
	Specific theory	68%	
	Practical	80%	

To avoid any doubt as to whether the apprentice has passed the 'core knowledge and skills – NDT' modules, the assessors should read the 'results notice', 'NDT certificate' or 'letter of approval', which will be included in the portfolio of evidence. The results notice will provide evidence as to whether the candidate has passed the NDT method and, if so, whether it is a 'pass' or a 'distinction'.

2.1 Project Presentation

The purpose of the project presentation is to give apprentices the opportunity to demonstrate that they have acquired the knowledge, skills and behaviour requirements identified in the apprenticeship standard. This will ultimately reduce the burden on the observational end-point assessment interview.

2.2 Apprenticeship Observational End-Point Assessment Interview and the Engineering Council PRI

The observational end-point assessment interview and the Engineering Council PRI will be carried out as one interview.

If the apprentice **has not ticked the box** for Engineering Council registration on the completion form, the assessors will still carry out the observational end-point assessment interview and the Engineering Council PRI but will not progress Engineering Council registration.

2.3 Engineering Council PRI

The Engineering Council PRI is a well-established process and can only be conducted by an Engineering Council-approved Professional Engineering Institute (PEI). Interviewers for the apprenticeship observational end-point assessment interview and the Engineering Council Professional Review Interview (combined) need to be registered with the Engineering Council as Incorporated Engineers (IEng) or as Chartered Engineers (CEng). They need to be extensively knowledgeable in NDT and must have undergone annual assessor and interview training.

2.4 Notes Taken During the Project Presentation and Observational Interview/PRI

The notes taken during both the project presentation and the observational interview/PRI have been combined into one document and are included as Appendix 3. The document has been compiled using the format of the Engineering Council 'Notes taken during the PRI interview' document but with a description of the Engineering Council mandatory competencies included together with the requirements of the NDT apprenticeship (in italics).

2.5 End-Point Assessment Statement

The assessors have reviewed the portfolio of evidence and, in particular, have noted the outcome recorded in the 'core knowledge and skills – NDT' results notice and the NDT certificate or letter of approval.

The project presentation was given by the apprentice, which allowed him/her to demonstrate the knowledge and skills and behaviours gained during the apprenticeship.

The assessors carried out an observational end-point assessment interview combined with an Engineering Council PRI, which allowed them to make a decision on the outcome of the apprenticeship.

The outcome of the observational end-point assessment interview combined with an Engineering Council PRI is recorded in Appendices 1, 2 and 3.

Appendix 1 – Apprenticeship Outcome

A1 Recommendation

Apprentice's name: _____

Unique Learner Number (ULN): _____

Apprentice's company name: _____

Date assessment carried out: _____

The apprentice has:

- Passed the apprenticeship with a distinction grade ☐ (add comments in box below)
- Passed the apprenticeship with a pass grade ☐ (add comments in the box below)
- Failed the apprenticeship ☐ (add comments in the box below)
- Passed the Engineering Council registration – EngTech grade with the required experience ☐
- Passed the Engineering Council registration – EngTech grade without the required experience (Associate Membership determines the experience requirements for the PRI and the NDT certificate or letter of approval determines the experience required for the NDT Level 2 knowledge and skills) ☐

Comments:

A2 Engineering Council Registration

The Engineering Council registration is an established process that will be carried out simultaneously with the end-point assessment.

The holistic requirements for the observational end-point assessment interview are different from those of the Engineering Council PRI so, therefore, the outcome of the combined processes might result in any one of the following scenarios:

- The apprentice fails the apprenticeship and fails the Engineering Council registration
- The apprentice fails the apprenticeship but passes the Engineering Council registration
- The apprentice passes the apprenticeship but fails the Engineering Council registration
- The apprentice passes the apprenticeship and passes the Engineering Council registration.

The score sheets for the combined Engineering Council registration and end-point assessment are presented in Appendix 2.

Appendix 2 – Professional Review for EngTech Registration

(Scores derived from notes taken during interview)

Combined apprenticeship end-point assessment and Engineering Council PRI – EngTech

Candidate's name:		Candidate's reference:	
Place of interview:		Date and time:	
Independent assessors:			
Observer:			

		Very strong 3	Practice standard 2	Adequate awareness 1	Little or no evidence 0	Row score	Block mean score
A	1. Review and select appropriate techniques, procedures and methods to undertake tasks						
	2. Use appropriate scientific, technical or engineering principles						
B	1. Identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions						
	2. Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact						
C	1. Work reliably and effectively without close supervision, to the appropriate codes of practice						
	2. Accept responsibility for work of self or others						
	3. Accept, allocate and supervise technical and other tasks						
D	1. Use oral, written and electronic methods for the communication in English of technical and other information						
	2. 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						

		Very strong 3	Practice standard 2	Adequate awareness 1	Little or no evidence 0	Row score	Block mean score
E	1. Comply with the code of conduct of your institution						
	2. Manage and apply safe systems of work						
	3. Undertake engineering work in a way that contributes to sustainable development. This could include an ability to: ■ Operate and act responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously.						
	4. Carry out and record continuing professional development (CPD) necessary to maintain and enhance competence in own area of practice, including: ■ 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.						
	5. Exercise responsibilities in an ethical manner.						
	Total score:						

Final Report on EngTech Professional Review

1. You should consider recommending the candidate for registration if the following conditions are met:

- The total score is not less than 22 for a pass or 26 for a distinction;
- The score in A1 and A2 is not less than 2 for a pass or 2.5 for a distinction in each module;
- The block mean score in any block other than A is not less than 1.5 for a pass or 1.75 for a distinction;
- There are no zeros across the whole form; and (where applicable)
- Any special requirements of the Institute have been satisfied.

2. Where these conditions are not met by a small margin but the reviewers wish to recommend registration, they may make a positive recommendation to the Institute's Membership Committee, provided that they argue a case for dispensation from normal guidelines. This must not be out of misplaced kindness but because there is evidence that cannot properly be accounted for on the form. Give the reasons below:

3. Where the guidelines are not met and there is no exceptional case to be made under paragraph 2, the candidate is not yet ready for registration in the section of the register for which he or she has applied. It may be possible to retest the evidence against the criteria for another section of the register, provided that both the candidate and reviewers agree to this course of action.

   Note: Within the apprenticeship (IfA rules), the apprentice is entitled to resit any part of the apprenticeship, provided that they can achieve this within six months of the end of the apprenticeship.

4. In the case of an interview conducted using video conferencing, the photographic identification (ID) of the candidate must be verified before the interview commences.

Verification of photo ID:

Verified ☐ Not applicable ☐

Apprenticeship recommendation:

Accept ☐ Reject ☐

Grade:

Pass ☐ Distinction ☐

Recommendations for re-sits:

Note 1: Re-sits cannot be used to improve on a pass to achieve a distinction.

Note 2: Re-sits have to be finished within six months of the end-point assessment.

Recommendation:

Accept ☐ Reject ☐

Chair Summary

Enter here a statement about the overall view of the panel. Any special strengths or weaknesses should be included.

Please be as informative as possible to ensure that it is obvious to the Engineering Council Working Group (ECWG) and Membership Qualification and Education (MQ&E) Committee how you reached your final recommendation.

The information supplied will be used to help any unsuccessful candidates address any shortcomings.

Any adverse decision will be discussed by the full MQ&E Committee.

Indicate candidate route: Standard ☐ Individual ☐

Standard route

Panel:

I certify that in assessing this candidate and completing this form I have acted impartially and there has been no conflict of interest.

(Please print name and give engineers' registration section, membership grade and other post-nominal initials.)

	Name	Signature
Chair		
Member		
Observer		

Appendix 3 – Notes Taken During the Project Presentation and the Observational End-Point Assessment Interview/Engineering Council PRI

NDT Operator		
A	**Use engineering knowledge and understanding to apply technical and practical skills**	
A1	Review and select appropriate techniques, procedures and methods to undertake tasks. *In-depth knowledge of one NDT method to include its capabilities and limitations. An awareness of other NDT methods of inspection and their general capabilities/ limitations.*	**Project**
		PRI
A2	Use appropriate scientific, technical or engineering principles. *Carry out inspections using one NDT method, which would include:* *Revealing defects present in the component.* *Working effectively within the limitations of standard tests and measurements relevant to their field of activity.* *Reading technical drawings to assist in the inspection process.*	**Project**
		PRI

B	**Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems or services**	
B1	Identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions. *Understanding of material and product technology associated with the specific industry sector.* *Clearly mark defective areas for other follow-up validation by supervisory staff, such as NDT Engineering Technicians.* *Prepare and submit clear and concise NDT inspection reports detailing the inspection findings.* *Have good practical ability, including hand/eye coordination, in order to apply NDT.*	**Project**
		PRI
B2	Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact. *Have knowledge required for the assessment of defects against acceptance/rejection criteria (required by standards).* *Refer the inspection results to more skilled or qualified personnel to continue with the inspection process, assessment and interpretation.* *Achieve good time management and a disciplined approach.*	**Project**
		PRI

C	**Accept and exercise personal responsibility**	
C1	Work reliably and effectively without close supervision, to the appropriate codes of practice. *Work under technical supervision and report regularly on progress.* *Perform NDT inspections in accordance with written NDT work instructions.* *Ask the supervisor for advice and guidance where appropriate.*	**Project**
		PRI
C2	Accept responsibility for work of self or others. *Exhibit environmental awareness and undertake safe working practices for self and others.*	**Project**
		PRI

C3	Accept, allocate and supervise technical and other tasks. *Demonstrate a disciplined approach relating to industry standard operations and processes.* *Teamwork – to work effectively in a team and support others where appropriate.*	**Project**
		PRI
D	**Use effective communication and interpersonal skills**	
D1	Use oral, written and electronic methods for the communication in English of technical and other information. *Communication – communicate effectively with senior NDT staff, such as NDT Engineering Technicians, in order to facilitate timely and accurate completion of the inspection programmes.* *Influence – have a positive impact without relying on others.*	**Project**
		PRI

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. *Delivery – consistently see things through to timely completion.* *Common sense – consistently apply knowledge and experience with balance.* *Influence – have a positive impact without relying on others.*	**Project** **PRI**
E	**Make a personal commitment to an appropriate code of professional conduct, recognising obligations to society, the profession and the environment.**	
E1	Comply with the code of conduct of your institution. *Be aware of relevant sector-specific technology, quality aspects and working practices, such as inductions and confidentiality.*	**Project** **PRI**

E2 Manage and apply safe systems of work. *Have health & safety knowledge pertinent to the specific requirements of the relevant NDT method.* *Demonstrate health & safety competencies pertinent to the relevant NDT method, such as working at heights, in confined spaces and in restricted zones.* *Develop an understanding of the consequences of failure and the risk to life.*	**Project**
	PRI
E3 Undertake engineering work in a way that contributes to sustainable development. This could include an ability to: ■ Operate and act responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously. *Ensure safe operation of the equipment within its capabilities and limitations.*	**Project**
	PRI

E4 Carry out and record CPD necessary to maintain and enhance competence in own area of practice, including: ■ 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. *The skillset and depth of proficiency retained by the NDT operator, while singularly focused on one NDT method, will need to consider future development needs that build on current knowledge and skills and enhance career aspirations.*	**Project** **PRI**
E5 Exercise responsibilities in an ethical manner. *Ethics – act with maturity, honesty, integrity and responsibility.*	**Project** **PRI**

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