

UK NANDTB 31: Guidance for OA & IA when compiling Specific Examinations

Compiled by the UK NANDTB Issue 1 - May 2025 Next planned review Jan 2028 Review Trigger event – EN4179 & AC7114 revision

UK NANDTB 31: Guidance to ALL OA and IA under the control of the UK NANDTB on Specific Examinations

Following the revision of the NADCAP checklists under AC7114/11 concerning the content of Specific examinations, the UK NANDTB has taken the decision to flow down the same guidance provided by NADCAP* to their auditors on the same subject.

The following should therefore be distributed via the OA/IA group to all OA & IA to assist in the development of specific theory examination packs.

*This material has been authorized by PRI NADCAP to be flowed down for use across the sector to promote consistency in the approach to specific Examinations. Acknowledgment is therefore given to David Penney, Principal Staff Engineer, Oct 2023.



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Questions on Specification/Technique/Procedure

• All questions should be situational in nature.

It is required that the question be posed either in a 'story' or as a set of variables, such as:

You are shadowing a new Level 2 who is carrying out a UV lamp intensity check. The Level 2 records the intensity as 1150 microwatts/cm sq. This is acceptable.

- a) True, in all cases.
- b) False
- c) True, but only when inspecting Type B product.



Questions on Specification/Technique/Procedure

• All questions should be situational in nature.

Or:

Which of the following UV lamp intensities would be considered acceptable during a process control check?

- a) 900 micro-watts/cm sq.
- b) 1100 micro-watts/cm sq.
- c) 1500 micro-watts/cm sq.



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Questions on Specification/Technique/Procedure

• All questions should be situational in nature.

These two styles are the simplest to implement, but others can be used at the discretion of the Examiner and this presentation contains more examples further on.

Situational questions ensure the candidate can interpret the question and compare it to the referenced document thereby meeting the EN4179/NAS410 requirement of:

7.1.4 (c): Questions utilizing such material shall require understanding of the information contained therein rather than merely finding its location.



All Multiple Choice Questions

• All multiple-choice questions not requiring a written answer of explanation should have a minimum of three answers.

Specific exam questions can be broadly separated into multiple-choice and essay-type. Multiple-choice is when the candidate must select one or more answers from a predefined list. Essay-type is where the candidate must write out their answer with an explanation. Sometimes the two can be combined.

If the question is purely multiple-choice, the question must have a minimum of 3 possible answers. This is to reduce the chance of candidates successfully guessing their way through an exam that contains questions with only two answers. The statistical probability of which is approximately 20% which does not meet the EN4179/NAS410 requirement in 7.1.4 (c).



Questions on product knowledge and other subjects specific/unique to the job role

Other questions specific to the operator's job role may be used at the discretion of the Responsible Level 3/Examiner/NANDTB. These may be used for instance to backfill an exam when the source material (e.g. a very short technique that is a step-by-step instruction) does not provide enough adequate material to generate 30 interpretive questions from inspection documentation.

These type of questions may also be used as additional questions over the minimum quota of 30.

However, it is the Task Group's expectation that the primary focus of the exam is to cover the candidate's inspection documentation

(specifications/procedures/techniques) in an 'open-book' style using reference material, as per AC7114 para 5.3.12.4:

Without focus on individual questions, determine if the overall examination was administered as open book with reference material provided.



(This is unacceptable if the procedure directly states the answer) Unless otherwise specified, penetrant dwell time shall be a minimum of:

- a. 5 minutes
- b. 10 minutes
- c. 30 minutes
- d. none of the above

1. (If the procedure directly references the word 'dwell time', a good approach is to try and avoid that term in the question. A question with two answers such as true/false or yes/no can be used but must be accompanied with an explanation) An operator covered a part with penetrant at 10:36 am. At 12:01 pm the operator commenced wash-off. Is this acceptable?

- a. Yes
- b. No

Explain why or why not:



2. (*This is unacceptable if the procedure directly states the answer*) Water-washable penetrant may be removed by:

- a. manual water spray
- b. automated water spray
- c. manual wipe
- d. all of the above are acceptable methods

2. (Here the terms 'manual water spray' and 'Water-washable', if that is how they are referred to in the procedure, are not used. Also, a second variable has been introduced) An operator has been viewed removing a Method A penetrant with a hand-controlled jet of water at 36 psi.

Is this acceptable and why or why not?



3. (This is unacceptable if the procedure directly states the answer) When a manual spray is used for penetrant removal, a coarse spray shall be used with a minimum of _____ inch between the spray nozzle and the part:

a. 6 inch b. 10 inch c. 12 inch

d. 15 inch

3. (The procedurally referenced minimum distance of 12" is not mentioned. The operator must select an acceptable scenario(s). Also, two or more correct answers may be introduced to achieve the full mark for the question) When a manual spray is used for penetrant removal, which of the following types of spray and distance would be acceptable (circle the correct answer(s))

a. coarse at 12 inch
b. coarse at 10 inch
c. fine at 14 inch
d. coarse at 15 inch
e. fine at 13 inch



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4. (If the procedure had a section stating 'In the event that over-washing occurs, the operator must....' Or similar, then this question would be deemed a 'look-up' question and would be unacceptable) Describe what action should be taken if over-washing occurs: 4. (Assuming the procedure talks directly about what to do in the case of 'over-washing', the question may be written to indirectly approach the subject without mentioning the actual term 'overwashing') An operator is seen placing a component into the drying oven midway through the penetrant inspection procedure. You check the surface of the part using a UV light and detect a distinct lack of background fluorescence.

Is this acceptable or not acceptable? Explain your answer.

What would be any action if necessary?

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5. (*This is unacceptable if the procedure directly states the answer*) According to the internal procedure, a UV-A lamp shall provide a minimum intensity of:

a. 1500 $\mu W/cm^2$ b. 1200 $\mu W/cm^2$ c. 1000 $\mu W/cm^2$ d. none of the above

5. (Again, the minimum intensity of 1200 is not referenced) Which of the following UV intensities would be deemed as acceptable as per this procedure?

a. 1700 μ W/cm² b. 900 μ W/cm² c. 1000 μ W/cm² d. none of the above e. all of the above



6. (*This is unacceptable if the procedure directly states the answer*) Personnel certification shall be in accordance with?

a. PCN Aero b. MIL-STD-410 c. ANSI/ASNT CP-189 d. A.I.A. NAS 410 e. a and d above 6. A person has been employed who has previously been certified to ISO 9712 in Penetrant. Can she immediately work for the company to perform Penetrant? State your reason as to why or why not:

(An acceptable answer or similar would be 'She cannot immediately work, because the procedure states that certification can only be in accordance with NAS 410.' It is not expected that a Level 2 candidate would necessarily know the operational difference between ISO 9712 and NAS 410 certification schemes, but just to know that the procedure does not allow any other certification scheme other than NAS 410.)



7. (If the procedure had a section stating 'In the event that the penetrant dwell time exceeds 2 hours....' Or 'Dwell times exceeding the maximum stated time (2 hours).....' Then this question would be deemed a 'look-up' question and would be unacceptable. A better approach would be to use a different time and ask whether the scenario would be acceptable or not) What action shall be taken if penetrant dwell time exceed two hours? 7. (A scenario is posed instead of a direct 'look-up' question. Also, scenarios that are not covered in the specification or do not have enough information detailed to make a judgement can be used which would invoke an answer of 'Not covered in the specification' or 'Not enough information to answer' or similar. Note - Questions such as this where an explanation is not required must have a minimum of three answers) An operator immersed a part in penetrant at 11:03 am. At 13:36pm the operator commenced wash-off. Is this acceptable?

- a. Yes
- b. No
- c. Not covered in the specification



8. (*This is unacceptable if the procedure directly states the answer*) Hydrophilic emulsifier concentration shall not exceed by volume of:

a. 10%

b. 5%

c. 35%

d. 15%

8. (*The minimum/maximum allowable as stated in the specification is not referenced*) A Hydrophilic emulsifier concentration has been recorded by volume at a concentration of 18%.

Is this acceptable? Explain why or why not.



9. (*This is unacceptable if the procedure directly states the answer*) What is the maximum dwell time for dry developers?

- a. Ten minutes
- b. One hour
- c. Four hours

9. (A scenario question with more than one possible answer avoiding the term 'dry developer') Which of the following would be an acceptable time for an operator to leave a 'form a' material on a part for? (Select all that are acceptable)

a. 24 minutesb. 2 hoursc. 140 minutes

