QUALITY DOCUMENTS

W.I. NUMBER 09A

INVIGILATOR TRAINING PROGRAMME FOR EN4179/NAS410 INVIGILATORS

This document forms an integral part of the Company Quality system, and adherence to the requirements specified within are mandatory upon all Company personnel and upon any subcontractor required to work in accordance with it.

This is a controlled document and must not be altered in any way without authorisation from the Company Quality Manager.

Issued by: 

Title: Quality Manager

Date: 01.01.16

Authorised / Approved by: 

Title: Co-Managing Director

Date: 01.01.16

Date amended	Section Amended	Amendment made	Name of person inserting change
01.01.16	1.1	New section inserted	S. Young
	Appendix 6	Heading amended	

Changes are hi-lighted
A copy of this document is sent to BINDT/PCN

CONTENTS

1.0 INTRODUCTION

1.1 This Work Instruction covers the invigilator training programme for NAS410/ EN4179 personnel for Level 3 Services on-contract companies. See WI 09 Section 6.0 for further details.

APPENDIX 1
INVIGILATOR TRAINING PROGRAMME FOR EN4179/NAS410 INVIGILATORS

INVIGILATOR NAME: .....

COMPANY NAME: .....

TRAINED BY: .....

SIGNATURE OF L3: .....

DATE: .....

APPENDIX 2

SIGNED INVIGILATOR STATEMENT

I, , of , have received, read and understood the following documents and am prepared to act as an appointed Invigilator on behalf of Lavender International Test Centre.

All information relating to this appointment will remain totally confidential.

a. QP4 – Control and Administration of Personnel Examinations (The invigilator must read sections 17, 22 & 23 at Appendix 6 of this document).

b. The applicable Points to be Observed During the Practical Examination which are contained within this document at Appendix 5.

Name in Full: ……
(Capital Letters)

Signed: .....

Date: .....

INVIGILATOR CHECK LIST

General	Room – quiet, clean, well lit	.....
	Exam requirements clear	.....
	Calculator – non-programmable (if applicable)	.....
	Cheating instructions given out verbally	.....
	No training material visible	.....
Theory	Satisfactory separation of candidates	.....
	Exam paper only on table	.....
	Check level of papers	.....
	Check method of papers	.....
	Check time limit	.....
Practical		
Samples	Check instruction sheet completed	.....
	Check samples	.....
	Check equipment/consumables	.....
	Check sample report forms	.....
	Check time limit	.....
Instruction	Check instruction sheet	.....
	Check samples	.....
	Check standards available	.....
	All notes to be left by candidate	.....
Health & Safety	Check relevant notices displayed and complied with	.....

AWAY COURSE/EXAM CHECK LIST

Adequate classroom facilities	.....
Adequate practical facilities	.....
Adequate teaching aids (as appropriate)	.....
Test samples – provided by Lavender International	.....

GENERAL, THEORY & PRACTICAL FACILITIES & METHODS CHECK LISTS

1.0 GENERAL

		ITEMS CHECKED
1.1	Familiarity with NAS410/EN4179 documents and method appendices.	☐
1.2	Familiarity with time allowed per paper or specimen.	☐
1.3	Ensure that no examination material is removed from the examination area.	☐
1.4	Ensure that all documents produced by the candidate are placed in the examination folder without discussion.	☐
1.5	Ensure that at no time during the examination the candidate is left unsupervised.	☐
1.6	Ensure that use of mobile phones is prohibited at all times during any part of NAS410/EN4179 examinations.	☐

2.0 THEORY EXAMINATION FACILITY

		ITEMS CHECKED
2.1	Assess the facility to satisfy that the room is clean, quiet, suitably illuminated and is adequately heated and comfortable.	☐
2.2	Ensure that candidates are seated at least 1.5 metre apart.	☐
2.3	Check that calculators are not programmable and that the candidate has not hidden crib sheets or written notes in or on the calculator case.	☐
2.4	Ensure that no talking between candidates occurs.	☐
2.5	Ensure that only the examination material permissible is on the table during the exam.	☐
2.6	Do not allow any candidates to leave the room during the completion of any examination paper.	☐

3.0 PRACTICAL EXAM FACILITY

3.1	Ensure that the work area conforms to the Health & Safety Regulations (refer to Lavender International QP5)	☐
3.2	Ensure that any equipment supplied by the test centre is not damaged and is within the calibration period stated on the calibration label.	☐
3.3	Ensure that all consumables required for the examination are available - including cleaning substances and clean tissues or cloths for restoration of surface after testing.	☐
3.4	Safety data cards for all consumables shall be made available for candidates to access during practical work.	☐
3.5	Candidates are not permitted to discuss any element of their examination with other candidates during examination conditions.	☐

GENERAL, THEORY & PRACTICAL FACILITIES & METHODS CHECK LISTS

1.0 GENERAL

		ITEMS CHECKED
1.7	Familiarity with EN4179/NAS410 documents and method appendices.	☐
1.8	Familiarity with time allowed per paper or specimen.	☐
1.9	Ensure that no examination material is removed from the examination area.	☐
1.10	Ensure that all documents produced by the candidate are placed in the examination folder without discussion.	☐
1.11	Ensure that at no time during the examination the candidate is left unsupervised.	☐
1.12	Ensure that use of mobile phones is prohibited at all times during any part of EN4179/NAS410 examinations.	☐

4.0 THEORY EXAMINATION FACILITY

		ITEMS CHECKED
4.1	Assess the facility to satisfy that the room is clean, quiet, suitably illuminated and is adequately heated and comfortable.	☐
4.2	Ensure that candidates are seated at least 1 metre apart.	☐
4.3	Check that calculators are not programmable and that the candidate has not hidden crib sheets or written notes in or on the calculator case.	☐
4.4	Ensure that no talking between candidates occurs.	☐
4.5	Ensure that only the examination material permissible is on the table during the exam.	☐
4.6	Do not allow any candidates to leave the room during the completion of any examination paper.	☐

5.0 PRACTICAL EXAM FACILITY

		ITEMS CHECKED
5.1	Ensure that the work area conforms to the Health & Safety Regulations (refer to Lavender International QP5)	☐
5.2	Ensure that any equipment supplied by the test centre is not damaged and is within the calibration period stated on the calibration label.	☐
5.3	Ensure that all consumables required for the examination are available - including cleaning substances and clean tissues or cloths for restoration of surface after testing.	☐
5.4	Safety data cards for all consumables shall be made available for candidates to access during practical work.	☐
5.5	Candidates are not permitted to discuss any element of their examination with other candidates during examination conditions.	☐

4.0 METHODS/TECHNIQUES

4.1 Magnetic Particle Methods **Holds Level 2** ☐

The following items of equipment shall be checked by the invigilator to ensure availability prior to the examination:

	ITEMS CHECKED
• AC Yoke	☐
• Coils (AC and/or DC)	☐
• Bench unit with current flow & magnetic flow or rigid coil	☐
• Prod unit when applicable to a required technique	☐
• Flux Indicators	☐
• Residual Field Meters	☐
• Settlement Flask	☐
• Photometer	☐
• Radiometer	☐
• Filtered UVA black light source	☐
• White Light Source	☐
• 4.5kg test Weight	☐
• BS6072 type TP1 current flow test sample	☐
• BS6072 type TP4 magnetic flow test sample	☐
• White contrast paint	☐
• Black ink solution and suitable means of application	☐

4.1 Magnetic Particle Methods Continued

ITEMS CHECKED

- Fluorescent ink solution and suitable means of application ☐
- Dry powder and suitable means of application ☐
- Test area that can be controlled to achieve a maximum white light level of 20 lux when fluorescent inspections are required ☐
- Verify that all consumables such as inks, paints, powders and solvents are within their expiry date and that batch numbers, where applicable are clearly visible. ☐
- **Verify that the filter on the UV-A source is intact and is not damaged, broken or cracked**. ☐

4.2 Liquid Penetrant Methods **Holds Level 2** ☐

The following items of equipment shall be checked by the invigilator to ensure availability prior to the exam:

	ITEMS CHECKED
• White light source	☐
• Filtered UVA black light source	☐
• Radiometer	☐
• Photometer	☐
• Tam Panels	☐
• Aluminium Comparator Blocks	☐
• Refractometer	☐
• Water wash station	☐
• Drying cabinet	☐
• Colour contrast penetrant	☐
• Fluorescent penetrant	☐
• Emulsifier	☐
• Developer	☐
• Viewing area that can be controlled to a maximum of 20 lux white light	☐
• Verify that all consumables such as solvents, penetrants and developing powders are within their expiry date and that batch numbers, where applicable are clearly visible.	☐
• **Verify that the filter on the UV-A source is intact and is not damaged, broken or cracked**.	☐

4.3 Ultrasonic Methods — Holds Level 2 ☐

The following items of equipment shall be checked by the invigilator to ensure availability prior to the exam:

ITEMS CHECKED

- "A" Scan Ultrasonic Set ☐
- Battery Charger ☐
- A selection of 0^0, 45^0, 60^0 & 70^0 Probes. ☐
- Suitable cables to connect the probes to the UT set. ☐
- A2, A4, A5 & A6 Calibration Blocks ☐
- 3mm diameter side drilled hole DAC block/s ☐
- 3mm Flat bottomed hole DAC block/s ☐
- Couplant ☐
- Beam Spreads & Measuring Equipment. ☐
- Chinagraph pencils for temporarily marking on metal surfaces. ☐

4.4 Radiographic Testing

Holds Level 2 ☐

Invigilators for radiographic testing shall hold current Basic radiation safety certification ☐

The following items of equipment shall be checked by the invigilator to ensure availability prior to the exam:

ITEMS CHECKED

- X ray set including control panel ☐
- Gamma source with wind-out mechanism. ☐
- Survey meter ☐
- Film Badge ☐
- IQIs/Penetrameters ☐
- Lead idents ☐
- Lead tape ☐
- Dark room and film processing equipment ☐
- Safe lights ☐
- Selection of radiographic film ☐
- Radiograph viewer with high & low intensity lamps. ☐
- Viewing area with a controlled maximum 10 lux white light level. ☐
- Densitometer. ☐
- Calibration strip to assess densitometer. ☐
- Low power magnifier. ☐
- Measuring Equipment. ☐

4.5 Radiographic Interpretation **Holds Level 2** ☐

- Radiograph viewer with high & low intensity lamps. ☐
- Viewing area with a controlled maximum 10 lux white light level. ☐
- Densitometer. ☐
- Calibration strip to assess densitometer. ☐
- Low power magnifier. ☐
- Measuring Equipment. ☐

4.6 Eddy Current Methods — Holds Level 2 ☐

The following items of equipment shall be checked by the invigilator to ensure availability prior to the exam:

	ITEMS CHECKED
• Phase display instrument	☐
• Battery Charger	☐
• Selection of test coils	☐
• Selection of balance loads	☐
• Connecting cables to suit coils and test instrument	☐
• Ferrous & non-ferrous slotted reference blocks	☐
• Non-conductive shims	☐
• Aluminium foil	☐
• Chart recorder & spare paper (tubes only)	☐
• Roll of masking tape	☐
• Roll of PVC tape	☐
• Measuring equipment	☐
• Protractor	☐

4.7 Visual Testing /Weld Inspection Methods

Holds Level 2 ☐

The following items of equipment shall be checked by the invigilator to ensure availability prior to the exam:

	ITEMS CHECKED
• Low power magnifier	☐
• High power magnifier (10 to 20X)	☐
• Adjustable light source	☐
• Torch	☐
• Selection of mirrors	☐
• Rigid Boresope	☐
• Measuring equipment	☐
• Welding gauges	☐
• Photometer	☐

4.8 Time of Flight Diffraction **Holds Level 2** ☐

The following items of equipment shall be checked by the invigilator to ensure availability prior to the exam:

ITEMS CHECKED

- System Control and Functional Checks ☐
- Verification of equipment settings ☐
- Setting up the NDT apparatus ☐
- Performance of test ☐
- Pre and post test ☐
- Integrity of data: coupling, PRF, gating ☐
- Position and direction of encoder ☐
- Contrast achieved ☐
- Production of the test report ☐

4.9 Phased Array **Holds Level 2** ☐

The following items of equipment shall be checked by the invigilator to ensure availability prior to the exam:

ITEMS CHECKED

- System Control and Functional Checks ☐
- Verification of equipment settings ☐
- Choice of array frequency and design ☐
- 'A' scan collection parameters ☐
- Method of setting equipment gain ☐
- Performance demonstration/calibration ☐
- Test Report ☐

4.10 Alternating Current Field Measurement Holds Level 2 ☐

The following items of equipment shall be checked by the invigilator to ensure availability prior to the exam:

	ITEMS CHECKED
• ACFM instrument	☐
• Power supply	☐
• Selection of probes	☐
• Calibration sample	☐
• Computer with software	☐
• Measuring equipment	☐

APPENDIX 5

POINTS TO BE OBSERVED DURING PRACTICAL EXAMINATIONS

METHOD 5.1 - MAGNETIC PARTICLE TESTING

1.1 System control and functional checks

System control and functional checks will usually include predetermined checks, each being allocated a share of the maximum marks (for example, measurement of magnetic ink solids content, use of CF and MF test pieces etc.)

1.2 Verification of equipment settings

Verification of settings will involve the candidate carrying out predetermined checks to give/demonstrate confidence in the ability of the technique to detect discontinuities in the range sought (for example, use of portable flux indicators, field strength meter; viewing conditions – white light and UV(A) radiation assessment etc.).

2.1 Preparation of the test piece

Surface preparation – pre-cleaning, contrast aid paint.

2.2 Technique selection (level 2)

Selection of magnetisation techniques to provide complete coverage with respect to geometry of specimen; selection of current or flux values; UV or white light.

2.3 Setting up the NDT apparatus

Preparation of portable and fixed units, prods, electromagnets, coils, contact heads; avoidance of fire hazards, correct ventilation, safe use of toxic materials and UV(A) radiation.

2.4 Performance of test

Correct application of field and detecting media with respect to the application of magnetisation; optimisation for detection of expected discontinuities.

2.5 Post test procedures

Preservation and/or recording of indications; demagnetisation; cleaning.

3.1 Detection of mandatory reportable defects

Detection of all reportable defects will normally attract maximum marks. However, missing one reportable defect (out of, for instance, a total of three in a specimen) will *normally* attract a mark of zero for detection and a commensurate reduction in

the remaining marks such that the candidate will fail that specimen, since it follows that characterisation, positioning and sizing cannot be carried out for a non-reported defect. A candidate failing one specimen may still achieve at least 70% for the practical part if sufficiently high marks are attained in all other specimens.

Examination centres will provide candidates with a code, specification or standard, or a locally devised instruction on reporting thresholds for each specimen.

3.2 Characterisation

Within the limitations of the NDT method, recording the nature of discontinuity detected (surface and sub-surface where applicable); its position and dimensions.

The candidate is expected to correctly state the nature of the reported indication. Candidate instructions will clarify what is expected in this respect, e.g. whether a simple description (volumetric or planar; crack-like indication) or a fuller description (fatigue crack; lack of sidewall fusion; cold shut; stress corrosion cracking) is required.

The candidate will be expected to accurately report the position of the reported indication with respect to a given datum by giving two dimensions longitudinal and transverse for surface methods and three dimensions length, through thickness and depth for volumetric methods.

Defect dimensions must be correctly reported with the tolerance defined in the master report. The tolerance allowed will depend upon the NDT method/technique and type/position of defect.

3.3 Level 2 evaluation against acceptance criteria

Off-line data analysis procedures for digital/computerised instruments.

Correct interpretation of procedure, code, standard or specification.

3.4 Production of the test report

All pertinent information is reported in writing or as computerised data.

The candidate failing to report a discontinuity specified on the specimen master report as 'mandatory for candidates to report' when performing the test in the conditions specified in the master report will be awarded zero marks for section 3 of the practical examination related to the specimen tested.

Non-reportable defects. The candidate will not be penalised for reporting a non-mandatory reportable discontinuity which does exist in the specimen. However, falsely reporting as a defect an indication which does not actually exceed the reporting threshold will be penalised. Examiners may use discretion in this but, where discretion is applied, the examination must be moderated.

Non-existent defects. The number of marks awarded for detection will be zero where non-existent defects are reported as exceeding the reporting threshold.

APPENDIX 5

POINTS TO BE OBSERVED DURING PRACTICAL EXAMINATIONS

METHOD 5.2 – PENETRANT TESTING

1.1 System control and functional checks

System control and functional checks will usually include predetermined checks, each being allocated a share of the maximum marks (for example, use of test panels; colour, fluorescent intensity and comparator checks of penetrants; concentration checks on developers; efficiency of penetrant removers etc.).

1.2 Verification of equipment settings

Verification of settings will involve the candidate carrying out predetermined checks to give/demonstrate confidence in the ability of the technique to detect discontinuities in the range sought (for example, compatibility of chemicals; pressure of water wash; viewing conditions – white light and UV(A) radiation assessment etc.).

2.1 Preparation of the test piece

Surface preparation.

2.2 Technique selection (level 2)

Selection of the penetrant and developer for optimum sensitivity with due regard to inspection criteria, surface condition and ambient light levels; UV or white light.

2.3 Setting up the NDT apparatus

Avoidance of fire hazards, correct ventilation, safe use of toxic materials and UV(A) radiation.

2.4 Performance of test

Correct application and removal of penetrant; correct use of liquid solvents, aqueous washes and post emulsifiers; correct contact times.

2.5 Post test procedures

Preservation and/or recording of indications; transparent tape transfer and other coating transfers, photographic (fluorescent and colour contrast); cleaning.

3.1 Detection of mandatory reportable defects

Detection of all reportable defects will normally attract maximum marks. However, missing one reportable defect (out of, for instance, a total of three in a specimen) will *normally* attract a mark of zero for detection and a commensurate reduction in

the remaining marks such that the candidate will fail that specimen, since it follows that characterisation, positioning and sizing cannot be carried out for a non-reported defect. A candidate failing one specimen may still achieve at least 70% for the practical part if sufficiently high marks are attained in all other specimens.

Examination centres will provide candidates with a code, specification or standard, or a locally devised instruction on reporting thresholds for each specimen.

3.2 Characterisation

Within the limitations of the NDT method, recording the nature of discontinuity detected (surface and sub-surface where applicable); its position and dimensions.

The candidate is expected to correctly state the nature of the reported indication. Candidate instructions will clarify what is expected in this respect, e.g. whether a simple description (volumetric or planar; crack-like indication) or a fuller description (fatigue crack; lack of sidewall fusion; cold shut; stress corrosion cracking) is required.

The candidate will be expected to accurately report the position of the reported indication with respect to a given datum by giving two dimensions longitudinal and transverse for surface methods and three dimensions length, through thickness and depth for volumetric methods.

Defect dimensions must be correctly reported with the tolerance defined in the master report. The tolerance allowed will depend upon the NDT method/technique and type/position of defect.

3.3 Level 2 evaluation against acceptance criteria

Off-line data analysis procedures for digital/computerised instruments.

Correct interpretation of procedure, code, standard or specification.

3.4 Production of the test report

All pertinent information is reported in writing or as computerised data.

The candidate failing to report a discontinuity specified on the specimen master report as 'mandatory for candidates to report' when performing the test in the conditions specified in the master report will be awarded zero marks for section 3 of the practical examination related to the specimen tested.

Non-reportable defects. The candidate will not be penalised for reporting a non-mandatory reportable discontinuity which does exist in the specimen. However, falsely reporting as a defect an indication which does not actually exceed the reporting threshold will be penalised. Examiners may use discretion in this but, where discretion is applied, the examination must be moderated.

Non-existent defects. The number of marks awarded for detection will be zero where non-existent defects are reported as exceeding the reporting threshold.

APPENDIX 5

POINTS TO BE OBSERVED DURING PRACTICAL EXAMINATIONS

METHOD 5.3 – ULTRASONIC TESTING

1.1 System control and functional checks

System control and functional checks will usually include predetermined checks, each being allocated a share of the maximum marks (for example, calibration exercise to check flaw detector performance; time base linearity; sensitivity and signal to noise ratio; probe index, beam angle and width, squint, pulse duration etc.).

1.2 Verification of equipment settings

Verification of settings will involve the candidate carrying out predetermined checks to give/demonstrate confidence in the ability of the technique to detect discontinuities in the range sought (for example, sensitivity setting – DAC and/or DGS methods etc.).

2.1 Preparation of the test piece

Assessment of surface condition regularity, choice of couplant, datums and reference points.

2.2 Technique selection (level 2)

Choice of technique related to geometry, size, surface condition, parent metal composition, weld metal structure, taking into account the influence of attenuation in the test piece.

2.3 Setting up the NDT apparatus

Time based calibration for probe angle and test piece geometry; projected distance, shortened projected distance; attenuation correction.

2.4 Performance of test

Correct use of equipment; appropriate scanning patterns; investigation and recording of indications.

2.5 Post test procedures

Equipment care; removal of couplant and restoration of test surface.

3.1 Detection of mandatory reportable defects

Detection of all reportable defects will normally attract maximum marks. However, missing one reportable defect (out of, for instance, a total of three in a specimen) will *normally* attract a mark of zero for detection and a commensurate reduction in

the remaining marks such that the candidate will fail that specimen, since it follows that characterisation, positioning and sizing cannot be carried out for a non-reported defect. A candidate failing one specimen may still achieve at least 70% for the practical part if sufficiently high marks are attained in all other specimens.

Examination centres will provide candidates with a code, specification or standard, or a locally devised instruction on reporting thresholds for each specimen.

3.2 Characterisation

Within the limitations of the NDT method, recording the nature of discontinuity detected (surface and sub-surface where applicable); its position and dimensions.

The candidate is expected to correctly state the nature of the reported indication. Candidate instructions will clarify what is expected in this respect, e.g. whether a simple description (volumetric or planar; crack-like indication) or a fuller description (fatigue crack; lack of sidewall fusion; cold shut; stress corrosion cracking) is required.

The candidate will be expected to accurately report the position of the reported indication with respect to a given datum by giving two dimensions longitudinal and transverse for surface methods and three dimensions length, through thickness and depth for volumetric methods.

Defect dimensions must be correctly reported with the tolerance defined in the master report. The tolerance allowed will depend upon the NDT method/technique and type/position of defect.

3.3 Level 2 evaluation against acceptance criteria

Off-line data analysis procedures for digital/computerised instruments.

Correct interpretation of procedure, code, standard or specification.

3.4 Production of the test report

All pertinent information is reported in writing or as computerised data.

The candidate failing to report a discontinuity specified on the specimen master report as 'mandatory for candidates to report' when performing the test in the conditions specified in the master report will be awarded zero marks for section 3 of the practical examination related to the specimen tested.

Non-reportable defects. The candidate will not be penalised for reporting a non-mandatory reportable discontinuity which does exist in the specimen. However, falsely reporting as a defect an indication which does not actually exceed the reporting threshold will be penalised. Examiners may use discretion in this but, where discretion is applied, the examination must be moderated.

Non-existent defects. The number of marks awarded for detection will be zero where non-existent defects are reported as exceeding the reporting threshold.

APPENDIX 5

POINTS TO BE OBSERVED DURING PRACTICAL EXAMINATIONS

METHOD 5.4 – RADIOGRAPHIC TESTING

1.1 Detection of mandatory reportable defects

See table 2 for radiographers and radiographic interpreters.

Detection of all reportable defects will normally attract maximum marks. However, missing one reportable defect (out of, for instance, a total of three in a specimen) will *normally* attract a mark of zero for detection and a commensurate reduction in the remaining marks such that the candidate will fail that specimen, since it follows that characterisation, positioning and sizing cannot be carried out for a non-reported defect. A candidate failing one specimen may still achieve at least 70% for the practical part if sufficiently high marks are attained in all other specimens.

Examination centres will provide candidates with a code, specification or standard, or a locally devised instruction on reporting thresholds for each specimen.

1.2 Characterisation

See table 2 for radiographers and radiographic interpreters.

Within the limitations of the NDT method, recording the nature of discontinuity detected (surface and sub-surface where applicable); its position and dimensions.

The candidate is expected to correctly state the nature of the reported indication. Candidate instructions will clarify what is expected in this respect, e.g. whether a simple description (volumetric or planar; crack-like indication) or a fuller description (fatigue crack; lack of sidewall fusion; cold shut; stress corrosion cracking) is required.

The candidate will be expected to accurately report the position of the reported indication with respect to a given datum by giving two dimensions longitudinal and transverse for surface methods and three dimensions length, through thickness and depth for volumetric methods.

Defect dimensions must be correctly reported with the tolerance defined in the master report. The tolerance allowed will depend upon the NDT method/technique and type/position of defect.

1.3 Level 2 evaluation against acceptance criteria

See table 2 for radiographers and radiographic interpreters.

Off-line data analysis procedures for digital/computerised instruments.

Correct interpretation of procedure, code, standard or specification.

1.4 Production of the test report

All pertinent information is reported in writing or as computerised data.

See table 2 for radiographers and radiographic interpreters.

The candidate failing to report a discontinuity specified on the specimen master report as 'mandatory for candidates to report' when performing the test in the conditions specified in the master report will be awarded zero marks for section 3 of the practical examination related to the specimen tested.

Non-reportable defects. The candidate will not be penalised for reporting a non-mandatory reportable discontinuity which does exist in the specimen. However, falsely reporting as a defect an indication which does not actually exceed the reporting threshold will be penalised. Examiners may use discretion in this but, where discretion is applied, the examination must be moderated.

Non-existent defects. The number of marks awarded for detection will be zero where non-existent defects are reported as exceeding the reporting threshold.

APPENDIX 5

POINTS TO BE OBSERVED DURING PRACTICAL EXAMINATIONS

METHODS 5.5 AND 5.9 – ALTERNATING CURRENT FIELD MEASUREMENT AND EDDY CURRENT TESTING

1.1 System control and functional checks

System control and functional checks will usually include predetermined checks, each being allocated a share of the maximum marks (for example, use of reference standards to provide confidence of detection of defects sought etc.).

1.2 Verification of equipment settings

Verification of settings will involve the candidate carrying out predetermined checks to give/demonstrate confidence in the ability of the technique to detect discontinuities in the range sought (for example, use of calibration blocks for setting sensitivity and reporting thresholds etc.).

2.1 Preparation of the test piece

Surface conditions and preparation – ensuring coatings are uniform and that lift off is within tolerance; marking the area for inspection.

2.2 Technique selection (level 2)

Equipment characteristics and selection; selection of probes and frequency to ensure complete coverage for the application, taking into account the limitations of the test equipment.

2.3 Setting up the NDT apparatus

Training/matching of probe to instrument; lift off compensation.

2.4 Performance of test

Correct use of instrument; probe handling (compensation for coating, edge, geometric and change of conductivity effects, investigation and interpretation of indications.

2.5 Post test procedures

Recording and retrieval of information (on computer/digital instrument, and using written report sheets); marking up of indications; care of equipment.

3.1 Detection of mandatory reportable defects

Detection of all reportable defects will normally attract maximum marks. However, missing one reportable defect (out of, for instance, a total of three in a specimen)

will *normally* attract a mark of zero for detection and a commensurate reduction in the remaining marks such that the candidate will fail that specimen, since it follows that characterisation, positioning and sizing cannot be carried out for a non-reported defect. A candidate failing one specimen may still achieve at least 70% for the practical part if sufficiently high marks are attained in all other specimens.

Examination centres will provide candidates with a code, specification or standard, or a locally devised instruction on reporting thresholds for each specimen.

3.2 Characterisation

Within the limitations of the NDT method, recording the nature of discontinuity detected (surface and sub-surface where applicable); its position and dimensions.

The candidate is expected to correctly state the nature of the reported indication. Candidate instructions will clarify what is expected in this respect, e.g. whether a simple description (volumetric or planar; crack-like indication) or a fuller description (fatigue crack; lack of sidewall fusion; cold shut; stress corrosion cracking) is required.

The candidate will be expected to accurately report the position of the reported indication with respect to a given datum by giving two dimensions longitudinal and transverse for surface methods and three dimensions length, through thickness and depth for volumetric methods.

Defect dimensions must be correctly reported with the tolerance defined in the master report. The tolerance allowed will depend upon the NDT method/technique and type/position of defect.

3.3 Level 2 evaluation against acceptance criteria

Off-line data analysis procedures for digital/computerised instruments.

Correct interpretation of procedure, code, standard or specification.

3.4 Production of the test report

All pertinent information is reported in writing or as computerised data.

The candidate failing to report a discontinuity specified on the specimen master report as 'mandatory for candidates to report' when performing the test in the conditions specified in the master report will be awarded zero marks for section 3 of the practical examination related to the specimen tested.

Non-reportable defects. The candidate will not be penalised for reporting a non-mandatory reportable discontinuity which does exist in the specimen. However, falsely reporting as a defect an indication which does not actually exceed the reporting threshold will be penalised. Examiners may use discretion in this but, where discretion is applied, the examination must be moderated.

Non-existent defects. The number of marks awarded for detection will be zero where non-existent defects are reported as exceeding the reporting threshold.

APPENDIX 5

POINTS TO BE OBSERVED DURING PRACTICAL EXAMINATIONS

METHOD 5.6 – VISUAL TESTING/WELD INSPECTION

1.1 System control and functional checks

System control and functional checks will usually include predetermined checks, each being allocated a share of the maximum marks (for example, cleanliness and serviceability of optical and lighting equipment etc.).

1.2 Verification of equipment settings

Verification of settings will involve the candidate carrying out predetermined checks to give/demonstrate confidence in the ability of the technique to detect discontinuities in the range sought (for example, calibration of measuring devices etc.).

2.1 Preparation of the test piece

Surface preparation – pre-cleaning.

2.2 Technique selection (level 2)

Selection of most appropriate optical viewing and measuring aids taking into account surface condition, roughness and reflectivity.

2.3 Setting up the NDT apparatus

Measurement of ambient light or of artificial light levels at inspection surface.

2.4 Performance of test

Correct use of equipment; further investigation of indications.

2.5 Post test procedures

Preservation and/or recording of indications – photographic or direct marking.

3.1 Detection of mandatory reportable defects

Detection of all reportable defects will normally attract maximum marks. However, missing one reportable defect (out of, for instance, a total of three in a specimen) will *normally* attract a mark of zero for detection and a commensurate reduction in the remaining marks such that the candidate will fail that specimen, since it follows that characterisation, positioning and sizing cannot be carried out for a non-reported

defect. A candidate failing one specimen may still achieve at least 70% for the practical part if sufficiently high marks are attained in all other specimens.

Examination centres will provide candidates with a code, specification or standard, or a locally devised instruction on reporting thresholds for each specimen.

3.2 Characterisation

Within the limitations of the NDT method, recording the nature of discontinuity detected (surface and sub-surface where applicable); its position and dimensions.

The candidate is expected to correctly state the nature of the reported indication. Candidate instructions will clarify what is expected in this respect, e.g. whether a simple description (volumetric or planar; crack-like indication) or a fuller description (fatigue crack; lack of sidewall fusion; cold shut; stress corrosion cracking) is required.

The candidate will be expected to accurately report the position of the reported indication with respect to a given datum by giving two dimensions longitudinal and transverse for surface methods and three dimensions length, through thickness and depth for volumetric methods.

Defect dimensions must be correctly reported with the tolerance defined in the master report. The tolerance allowed will depend upon the NDT method/technique and type/position of defect.

3.3 Level 2 evaluation against acceptance criteria

Off-line data analysis procedures for digital/computerised instruments.

Correct interpretation of procedure, code, standard or specification.

3.4 Production of the test report

All pertinent information is reported in writing or as computerised data.

The candidate failing to report a discontinuity specified on the specimen master report as 'mandatory for candidates to report' when performing the test in the conditions specified in the master report will be awarded zero marks for section 3 of the practical examination related to the specimen tested.

Non-reportable defects. The candidate will not be penalised for reporting a non-mandatory reportable discontinuity which does exist in the specimen. However, falsely reporting as a defect an indication which does not actually exceed the reporting threshold will be penalised. Examiners may use discretion in this but, where discretion is applied, the examination must be moderated.

Non-existent defects. The number of marks awarded for detection will be zero where non-existent defects are reported as exceeding the reporting threshold.

APPENDIX 5

POINTS TO BE OBSERVED DURING PRACTICAL EXAMINATIONS

METHOD 5.7 – TIME OF FLIGHT DEFRACTION TESTING

This checklist highlights the control functions expected of the Invigilator involved in EN4179/NAS410 TOFD practical exams.

1.0 Data collection:

Identify suitable equipment for performing data collection (Refer to list of equipment required for practical examination) _____

Equipment functional check performed (Refer to performance demonstration required as part of the practical examination instruction to candidates) _____

Clear the data collection computer hard drive of all set-up files (Refer to computer hard drive data clearing procedure) _____

Verify correct samples are selected for the candidate _____

Provide blank computer disk for the invigilator to save the candidates examination data on. _____

Provide the candidate with the samples and the Lavender International NDT Ltd instructions to candidate / report form package for data acquisition and monitor the exam. _____

On completion of the data collection section of the practical examination save the candidates data onto disk and delete all data files from the computer hard drive _____

2.0 Analysis of data:

Clear the test centre computer hard drive of all scan data (Refer to computer hard drive data clearing procedure) _____

Collect the candidates examination portfolio from the Quality Manager & verify the candidate's data analysis portfolio contains a uniquely identified CD containing 5 TOFD data files and the Lavender International NDT Ltd. Instructions to candidate / report forms. The CD shall be identified by the candidate's name and the examination results notice number allocated to that candidate for the examination. _____

Provide the candidate with the portfolio and monitor the examination. _____

Retrieve from the candidate the report forms and data CD and return the examination package to the Quality manager for safe storage. _____

Clear the test centre computer hard drive of all scan data. (Refer to computer hard drive data clearing procedure) _____

APPENDIX 6
Extracts from QP4 Sections 17, 22 & 23 for Reference Purposes

17.0 INVIGILATORS

17.1 Before any examinations take place Invigilators shall ensure examination facilities are adequate in terms of comfort, lighting etc. and complete the Invigilator check-list on the back of the candidate's exam portfolio.

17.2 Invigilation of examinations shall be carried out by persons who have been made fully aware of their responsibilities and duties; and who have received appropriate training as outlined within section 3.12 of this procedure above.

17.3 All Invigilators will have access to all examination procedural documentation and applicable records forms.

17.4 All authorised Invigilators have been given instruction through the Invigilator Training Programme detailed in Work Instruction WI 09 (or a previous version of this document).

17.5 EN4179/NAS410 company-based invigilators are given instruction through WI09A.

17.6 All authorised and approved Invigilators are identified on the Company's PCN Schedule of Approvals.

17.6 All Invigilators are empowered to ensure that secure examination conditions are maintained at all times and that any infringement of examination conditions by any examination candidate is recorded and immediately reported to the TCCE and/or the PCN Co-ordinator for appropriate action.

22.0 ADDITIONAL SPECIFIC EXAMINATION REQUIREMENTS AND RESPONSIBILITIES FOR SNT EXAMINATIONS

22.1 GENERAL

22.1.1 This section describes the examination requirements in respect of Companies who have created a Written Practice (Procedure) based on the ASNT Recommended Practice SNT-TC-1A. A number of editions of this document are available and Companies are requested to specify which edition their Written Practice is based upon.

22.1.2 Before the SNT examination candidate attends the Test Centre for examination purposes details of the customer's Written Practice shall be required to be obtained to determine the examination requirements. This will be done by the Quality Manager.

22.1.3 Where no such document exists then Lavender International shall provide full assistance to the employer for the production of this document as examination within the SNT-TC-1A system cannot be carried out without an employer's Written Practice.

22.1.4 In order for the employer to discharge his responsibility with respect to certification to his Written Practice completed examination papers may be returned to the employer on request.

22.1.5 Recertification examinations will be carried out in accordance with the employer's Written Practice.

22.2 THEORY EXAMINATIONS

22.2.1 All SNT examination papers shall be written by an approved Company Level 3 and shall show the date and initials of that person. (See QP4 Section 9.2).

22.2.2 All papers shall be given a unique reference number and a master list of approved papers shall be held by the Quality Manager.

22.2.3 All marking shall be carried out against master answer sheets which carry the same unique number as the question paper and will be retained in the master file with the questions.

22.2.4 All SNT examination papers are marked by an appropriate Level 3.

22.3 PRACTICAL EXAMINATIONS

22.3.1 All specimens used for SNT examinations are identified on the master specimen list. All specimens are given a unique reference number.

23.3.2 All specimens for SNT examinations have Master Reports. Each specimen is examined by a person having qualifications of SNT Level 2 minimum in the technique and discipline for the specimen being tested. The Master Report is endorsed and dated by an ASNT Level 3 person approved in the technique being examined.

23.3.3 Marking of the examination reports will be carried out by an appropriate ASNT Level 3 person taking due note of the Master Marking Schedule.

23.3.4 Examination candidates for Ultrasonic Examination of Welds will be allocated Test Pieces in accordance with (Section 10.11 of this procedure).

22.4 SNT RECERTIFICATION BY CONTINUED SATISFACTORY PERFORMANCE

22.4.1 It is possible to requalify NDT personnel working to the SNT Scheme on a continuing satisfactory performance basis.

22.4.2 The requirements for requalifying on this basis are in accordance with their individual company Written Practice.

23.0 ADDITIONAL SPECIFIC EXAMINATION REQUIREMENTS AND RESPONSIBILITIES FOR NAS 410 & EN4179

23.1 GENERAL

23.1.1 This section identifies the necessary requirement to meet NAS 410 and EN 4179.

23.1.2 Section 22 of this procedure shown above generally describes the administration and general examination requirements that also apply to this section.

23.1.3 All examinations will be carried out to the particular requirements described in NAS 410/EN 4179 and the relevant Company Written Practice.

23.2 SPECIFIC EXAM REQUIREMENTS

23.2.1 The relevant Company Written Practice will identify the Prime Certification Specification documents, however this will not capture the specific Process Specification which shall be required to be determined by the responsible Level 3 authority and notified to Lavender International.

23.2.2 These Process Specifications must be included on form "Exam Requirements for NDT/ME Personnel" (QD 03) to this procedure and shall be signed by the relevant Level 3 Authority.

23.2.3 Marking of the examination reports will be carried out by an appropriate NAS410/EN4179 Level 3 person taking due note of the Master Marking Schedule.

23.2.4 Examination certificates may only be signed off by an appropriate NAS410/EN4179 Level 3.