



**AMERICAN SOCIETY  
for  
NONDESTRUCTIVE TESTING**

Recommended Practice

No. SNT-TC-1A

(June 1980 Edition)

THIS DOCUMENT IS INTENDED AS A GUIDELINE FOR EMPLOYERS  
TO ESTABLISH THEIR OWN WRITTEN PRACTICE FOR THE QUALI-  
FICATION AND CERTIFICATION OF THEIR NDT PERSONNEL. IT IS  
NOT INTENDED TO BE USED AS A STRICT SPECIFICATION.

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***FOREWORD***

The recommended practice contained herein establishes the general framework for a qualification and certification program. In addition, the document provides recommended educational, experience, and training requirements for the different test methods. Supplementary documents include question and answer lists which may be used in composing examinations for nondestructive testing personnel.

Inquiries related to this recommended practice should be directed to the Chairman of the Personnel Qualification Division, at the following address:

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# RECOMMENDED PRACTICE NO. SNT-TC-1A

## PERSONNEL QUALIFICATION AND CERTIFICATION IN NONDESTRUCTIVE TESTING

### 1. SCOPE

- 1.1 It is recognized that the effectiveness of nondestructive testing (NDT) applications depends upon the capabilities of the persons who are responsible for, and perform, nondestructive testing. This Recommended Practice has been prepared to establish guidelines for the qualification and certification of nondestructive testing personnel whose specific jobs require appropriate knowledge of the technical principles underlying the nondestructive tests they perform, witness, monitor, or evaluate.
- 1.2 This document provides guidelines for the establishment of a qualification and certification program.
- 1.3 These guidelines have been developed by the American Society for Nondestructive Testing to aid employers in recognizing the essential factors to be considered in qualifying employees engaged in any of the test methods listed in Par. 3.
- 1.4 It is recognized that these guidelines may not be appropriate for certain employers' circumstances and/or applications. In developing a written practice as required in Par. 5, the employer shall review the detailed recommendations presented herein, and shall modify them as necessary to meet particular needs.

### 2. DEFINITIONS

- 2.1 Terms included in this document are defined as follows:
  - (1) Qualification — Demonstrated skill, training, knowledge and experience required for personnel to properly perform the duties of a specific job.
  - (2) Certification — Written testimony of qualification.
  - (3) Certifying Agency — The employer of the personnel being certified.

- (4) Recommended Practice — A set of guidelines to assist the employer in developing uniform procedures for the qualification and certification of nondestructive testing personnel to satisfy the employer's specific requirements.
- (5) Employer — The corporate, private, or public entity which employs personnel for wages, salary, fees, or other considerations.
- (6) Training — The program developed to impart the knowledge and skills necessary for qualification.

### 3. NONDESTRUCTIVE TEST METHODS

- 3.1 Qualification and certification of nondestructive testing personnel in accordance with this Recommended Practice is applicable to each of the following methods:

- |                                  |       |
|----------------------------------|-------|
| (1) Radiographic Testing         | (RT)  |
| (2) Magnetic Particle Testing    | (MT)  |
| (3) Ultrasonic Testing           | (UT)  |
| (4) Liquid Penetrant Testing     | (PT)  |
| (5) Eddy Current Testing         | (ET)  |
| (6) Neutron Radiographic Testing | (NRT) |
| (7) Leak Testing                 | (LT)  |
| (8) Acoustic Emission            | (AE)  |

### 4. LEVELS OF QUALIFICATION

- 4.1 There are three basic levels of qualification. These levels may be further subdivided by the employer for specific situations where additional levels of skills and responsibilities are deemed necessary.
- 4.2 While in the process of being qualified and certified to NDT Level I, an individual should be considered a Trainee. A Trainee should work with a certified individual and shall not independently conduct any tests, interpret or evaluate the results of a test, or report test results.

**4.3** The three basic levels of qualification are as follows:

- (1) **NDT LEVEL I** — An NDT Level I individual should be qualified to properly perform specific calibrations, specific tests, and specific evaluations for acceptance or rejection determinations according to written instructions and to record results. The NDT Level I shall receive the necessary instruction or supervision from a certified NDT Level II or III individual.
- (2) **NDT LEVEL II** — An NDT Level II individual should be qualified to set up and calibrate equipment and to interpret and evaluate results with respect to applicable codes, standards, and specifications. The NDT Level II should be thoroughly familiar with the scope and limitations of the methods for which the individual is qualified and should exercise assigned responsibility for on-the-job training and guidance of trainees and NDT Level I personnel. The NDT Level II should be able to prepare written instructions, and to organize and report the results of nondestructive tests.
- (3) **NDT LEVEL III** — An NDT Level III individual should be capable of establishing techniques and procedures; interpreting codes, standards, specifications, and procedures; and designating the particular test methods, techniques, and procedures to be used. The NDT Level III should be responsible for the NDT operations for which qualified and to which assigned, and should be capable of interpreting and evaluating results in terms of existing codes, standards, and specifications. The NDT Level III should have sufficient practical background in applicable materials, fabrication, and product technology to establish techniques and to assist in establishing acceptance criteria where none are otherwise available. The NDT Level III should have general familiarity with other appropriate NDT methods, and should be qualified to train and examine NDT Level I and Level II personnel for certification.

## 5. WRITTEN PRACTICE

- 5.1** The employer shall establish a written practice for the control and administration of NDT personnel training, examination, and certification.
- 5.2** The employer's written practice shall describe the responsibility of each level of certification for determining the acceptability of materials or components in accordance with the applicable codes, standards, specifications, and procedures.

## 6. EDUCATION, TRAINING, AND EXPERIENCE REQUIREMENTS FOR INITIAL QUALIFICATION

- 6.1** Personnel considered for certification in nondestructive testing shall have sufficient education, training,

and experience to ensure understanding of the principles and procedures of those areas of testing in which they are being considered for certification.

- 6.2** Documented training and/or experience gained in positions and activities equivalent to those of levels I, II, and/or III prior to establishment of the employer's written practice may be considered in satisfying the criteria of Par. 6.3.
- 6.3** To be considered for certification, a candidate should satisfy one of the following criteria for the applicable NDT level:

### 6.3.1 NDT Levels I and II

Table 6.3.1 lists the recommended training and experience factors to be considered by the employer in establishing written practices for initial qualification of Level I and Level II individuals.

### 6.3.2 NDT Level III

- (1) Have graduated from a minimum four-year college or university curriculum with a degree in engineering or science plus one year's experience in nondestructive testing in an assignment comparable to that of an NDT Level II in the applicable test method(s),

or:

- (2) Have completed with passing grades at least two years of engineering or science study at a university, college, or technical school plus two years experience in assignments at least comparable to that of NDT Level II in the applicable test method(s),

or:

- (3) Have four years experience in an assignment at least comparable to that of an NDT Level II in the applicable testing method(s).

When the individual is qualified by examination, the above requirements may be partially replaced by experience as a certified NDT Level II, or in assignments at least comparable to NDT Level II, in other methods listed in Par. 3 of this Recommended Practice as defined in the employer's written practice.

## 7. TRAINING PROGRAMS

- 7.1** Personnel being considered for certification should complete sufficient organized training to become thoroughly familiar with the principles and practices of the specified test method related to the level of certification desired and applicable to the practices to be used and the products to be tested.
- 7.2** The training program should include sufficient examinations to assure that the necessary information has been comprehended.
- 7.2.1** Recommended training course outlines for Levels I and II personnel and recommended references which may be used as technical source material are appended as follows:

Test Method	Training Course Table Number	Reference Table Number
Radiographic Testing	I-A	II-A
Magnetic Particle Testing	I-B	II-B
Ultrasonic Testing	I-C	II-C
Liquid Penetrant Testing	I-D	II-D
Eddy Current Testing	I-E	II-E
Neutron Radiographic Testing	I-F	II-F
Leak Testing	I-G	II-G
Acoustic Emission	(In course of preparation)	

used by the employer in his nondestructive testing procedures.

## 8. EXAMINATIONS

**8.1** An NDT Level III individual or his designated representative should administer and grade examinations. The examinations to verify physical and technical qualifications should consist of the following:

### 8.1.1 Physical

- (1) The examination should assure natural or corrected near-distance acuity in at least one eye such that the applicant is capable of reading a minimum of Jaeger Number 2 or equivalent type and size letters at a distance of not less than 12 inches (30.5 cm) on a standard Jaeger test chart. The ability to perceive an Ortho-Rater minimum of 8 or similar test pattern is also acceptable.
- (2) The examination should demonstrate the capability of distinguishing and differentiating contrast between colors used in the method.
- (3) The examination should demonstrate additional physical capabilities as required by the employer.
- (4) The examination should be administered on an annual basis.
- (5) Examination results are to be kept on file for the period of certification (see Par. 9.7).

### 8.1.2 General (Written) (For NDT Levels I and II)

- (1) The general examinations should be addressed to the basic principles of the applicable method.
- (2) In preparing the examination, the employer should select or devise appropriate questions covering the applicable method to the degree required by the employer's written practice.
- (3) The questions and answers provided in the applicable separate Question Booklets (See 8.2) are suggested as guidelines for the development of the general examination.

### 8.1.3 Specific (Written) (For NDT Levels I and II)

- (1) The specific examination should address the equipment, operating procedures, and test techniques that the applicant may encounter during specific assignments to the degree required by the employer's written practice.
- (2) The specific examination should also cover the specifications or codes and acceptance criteria

### 8.1.4 Practical (for NDT Level I and II)

- (1) The candidate should demonstrate familiarity with and the ability to operate the necessary test equipment, record, and analyze the resultant information to the degree required.
- (2) At least one selected specimen should be tested and the results of the test analyzed by the candidate.
- (3) The description of the specimen, the test procedure, including check points, and the results of the examination should be documented.

**8.1.5** NDT Level III examinations should be in accordance with Par. 8.3.3.

**8.2** Suggested examination questions and answers for use in compiling appropriate general examinations are presented in the separate Question Booklets which can be obtained from ASNT Headquarters. The following is a list of the booklets.

Test Method	Question Booklets
Radiographic Testing	A
Magnetic Particle Testing	B
Ultrasonic Testing	C
Liquid Penetrant Testing	D
Eddy Current Testing	E
Neutron Radiographic Testing	F
Leak Testing	G
Acoustic Emission	(In course of preparation)

**8.3** The following paragraphs describe the recommended examinations for each NDT level for the various nondestructive testing methods. The written examinations should be administered without access to reference material (closed book) except that necessary data, such as graphs, tables, specifications, procedures, and codes, may be provided. All questions used for Level I and Level II examinations shall be approved by the responsible Level III.

### 8.3.1 NDT Level I

- (1) General Examination — The recommended minimum number of Level I questions which should be given are:

Test Method	Number of Questions
Radiographic Testing	40
Magnetic Particle Testing	30
Ultrasonic Testing	40
Liquid Penetrant Testing	30
Eddy Current Testing	30
Neutron Radiographic Testing	40
Leak Testing	20
Acoustic Emission	40

- (2) Specific Examination — The recommended minimum number of questions which should be given are:

Test Method	Number of Questions
Radiographic Testing	20
Magnetic Particle Testing	20
Ultrasonic Testing	20
Liquid Penetrant Testing	20
Eddy Current Testing	15
Neutron Radiographic Testing	15
Leak Testing	
1. Bubble Test	15
2. Absolute Pressure Leak Test (Pressure Change)	15
3. Halogen Diode Leak Test	15
4. Mass Spectrometer Leak Test	20
Acoustic Emission	20

- (3) Practical Examination — Proficiency shall be demonstrated in performing the applicable non-destructive tests on one or more samples approved by the NDT Level III. At least ten different checkpoints requiring an understanding of test variables and the employer's procedural requirements shall be included in this practical examination.

### 8.3.2 NDT Level II

- (1) General Examination — The recommended minimum number of Level II questions to be given are:

Test Method	Number of Questions
Radiographic Testing	40
Magnetic Particle Testing	30
Ultrasonic Testing	40
Liquid Penetrant Testing	30
Eddy Current Testing	30
Neutron Radiographic Testing	40
Leak Testing	20
Acoustic Emission	40

- (2) Specific Examination — The recommended minimum number of questions to be given are:

Test Method	Number of Questions
Radiographic Testing	20
Magnetic Particle Testing	15
Ultrasonic Testing	20
Liquid Penetrant Testing	15
Eddy Current Testing	15
Neutron Radiographic Testing	15
Leak Testing	
1. Bubble Test	15
2. Absolute Pressure Leak Test (Pressure Change)	15
3. Halogen Diode Leak Test	15
4. Mass Spectrometer Leak Test	40
Acoustic Emission	20

- (3) Practical Examination — Proficiency should be demonstrated in selecting and performing the applicable nondestructive tests and interpreting

and evaluating the results on one or more samples approved by the NDT Level III. At least ten different checkpoints requiring an understanding of test variables and the employer's procedural requirements should be included in this practical examination.

### 8.3.3 NDT Level III

- (1) Basic Examination (Required only once when more than one method of examination is taken).

- (a) Twenty (20) questions relating to understanding the SNT-TC-1A document.
- (b) Fifteen (15) questions relative to applicable materials, fabrication, and product technology.
- (c) Fifteen (15) questions which are selected from or are similar to published Level II questions for other appropriate NDT methods.

- (2) Method Examination (for each method).

- (a) Thirty (30) questions relating to fundamentals and principles, which are selected from or are similar to published ASNT Level III questions for each method, and
- (b) Fifteen (15) questions relating to application and establishment of techniques and procedures which are selected from or are similar to the published ASNT Level III questions for each method, and
- (c) Twenty (20) questions relating to capability for interpreting codes, standards, and specifications relating to the method.

- (3) Specific Examination (for each method).

- (a) Twenty (20) questions relating to specifications, equipment, techniques, and procedures applicable to the employer's product(s) and methods employed, and to the administration of the employer's written practice.

8.3.4 On the basis of demonstrated ability, achievement, experience, and education, as defined in Par. 4.3.(3) and 6.3, the employer may waive examination for the Level III individual. Written certification should be provided, and evidence supporting the certification should be held on file and be made available when verification is required.

## 8.4 Grading

8.4.1 An NDT Level III shall be responsible for the administration and grading of examinations for NDT Level I & II personnel. The administration and grading of examinations may be delegated to a designated representative of the NDT Level III and so recorded. The employer shall be responsible for administration and grading of examinations for Level III personnel. The actual administration and grading of Level III examinations may be performed by a designated representative of the employer.

8.4.2 A composite grade based upon the general, specific, and practical or upon the basic, method, and specific

examinations should be developed by the employer. The composite grade may be a simple average of the examinations or may be developed by applying a weighting factor to each examination. The method of arriving at the composite grade prescribed in the employer's written practice should not be changed indiscriminately to fit the capabilities of the candidate.

8.4.3 When weighting factors are used, the total of the weighting factors shall equal 1.0. The weighting factors should be within the following ranges:

(1) NDT Level I Weighting Factors

- (a) General — 0.2 to 0.6
- (b) Specific — 0.2 to 0.5
- (c) Practical — 0.3 to 0.7

(2) NDT Level II Weighting Factors

- (a) General — 0.3 to 0.7
- (b) Specific — 0.2 to 0.6
- (c) Practical — 0.2 to 0.5

(3) NDT Level III Weighting Factors

- (a) Basic — 0.2 to 0.5
- (b) Method — 0.3 to 0.6
- (c) Specific — 0.2 to 0.4

(4) The composite grade (Gc) is determined as follows:

$$\text{Levels I \& II; } G_c = (G_g \times W_g) + (G_s \times W_s) + (G_p \times W_p)$$

$$\text{Level III; } G_c = (G_b \times W_b) + (G_m \times W_m) + (G_s \times W_s)$$

Where Gc = Composite grade

Gg = Actual grade from general examination in percent

Wg = Weighting factors of general examination

Gs = Actual grade from specific examination in percent

Ws = Weighting factor of specific examination

Gp = Actual grade from practical examination in percent

Wp = Weighting factor of practical examination

Gb = Actual grade from basic examination in percent

Wb = Weighting factor of basic examination

Gm = Actual grade from method examination in percent

Wm = Weighting factor of method examination

8.4.4 When an examination is administered for qualifica-

tion, a composite passing grade of 80% or greater is recommended. In addition, each passing grade for the general, specific, and practical or the basic, method, and specific examination is recommended to be 70% or greater. Test objects should be used in the practical examination when appropriate.

8.4.5 When examination is administered and graded for the employer by an outside agency, and the outside agency issues grades of Pass or Fail only, on a certified report, then the employer may accept the Pass grade as 80%, for that particular examination.

8.5 Reexamination

(1) Those failing to attain the required grades must wait at least 30 days or show evidence of having received suitable additional training as determined by the employer before re-examination.

9. CERTIFICATION

9.1 Certification of all levels of NDT personnel is the responsibility of the employer.

9.2 The employer shall establish written practices covering all phases of certification including training as specified in Par. 5.

9.3 Certification of NDT personnel shall be based on demonstration of satisfactory qualification as determined by procedures outlined in Par. 6, 7, and 8 as modified by the employer's written practices.

9.4 At the option of the employer, an outside agency may be engaged to provide NDT Level III services. In such instances, the responsibility of certification must be retained by the employer.

9.5 The employer who purchases outside services is responsible for assuring that training and examination services are in accordance with the employer's written practices.

9.6 Personnel certifications and copies of the employer's written practices shall be maintained on file by the employer.

9.6.1 The qualification records of the certified individuals shall be maintained by the employer and should include the following:

- (1) Name of certified individual.
- (2) Level of certification and test method.
- (3) Educational background and experience of certified individuals.
- (4) Statement indicating satisfactory completion of training in accordance with the employer's written procedure.
- (5) Results of the physical examination prescribed in Par. 8.1.1.
- (6) Current examination copy(s) or evidence of successful completion of the examinations.
- (7) Other suitable evidence of satisfactory qualifications when such qualifications are used in lieu of examinations.
- (8) Composite grade(s) or suitable evidence of grades.

- (9) Dates of certification and / or recertification and the dates of assignment to NDT.
- (10) Signature of employer's designated representative.

#### 9.7 Recertification

- 9.7.1 All levels of NDT personnel should be recertified at least once every three years in accordance with one of the following criteria:
  - (1) Evidence of continuing satisfactory performance.
  - (2) Re-examination in those portions of the examinations in Par. 8.3 deemed necessary by the employer's NDT Level III.
- 9.7.2 NDT personnel may be re-examined any time at the discretion of the employer and have their certifications extended or revoked.
- 9.7.3 The employer's written practice should include rules covering the duration of interrupted service which will require re-examination and recertification.

### 10. TERMINATION

- 10.1 The employer's certification shall be deemed revoked when employment is terminated.
- 10.2 A Level I, Level II, or Level III whose certification has been terminated may be recertified to his former NDT level by a new employer based on examination as described in Par. 8 provided all of the following conditions are met to the new employer's satisfaction:
  - (1) The employee has proof of prior certification.
  - (2) The employee was working in the capacity to which he certified within six months of termination .
  - (3) The employee is being recertified within six months of his termination.

**Table 6.3.1**  
**RECOMMENDED TRAINING AND EXPERIENCE LEVELS**

**TRAINING (HOURS)**

Examination Method	RT		MT		UT		PT		ET		NRT		AE		LT							
	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	III	IV				
Technique													BT	PCMT	HDLT	MSLT	BT	PCMT	HDLT	MSLT		
Completion with a passing grade of at least 2 years of engineering or science study at a university, college, or technical school	12	40	8	4	24	40	4	4	8	8	12	40	40	30	2	16	8	28	2	12	6	16
High school graduation or equivalent	20	40	12	8	40	40	4	8	12	8	20	40	60	60	2	24	12	40	4	16	8	24
Grammar school graduation, or demonstration proficiency, or additional training	80	80	24	16	40	80	12	16	48	24	80	80	80	80	2	60	24	60	4	80	20	80
<b>WORK TIME EXPERIENCE (MONTHS)</b>																						
All educational levels as listed above	3	9	1	3	3	9	1	2	1	9	6	24	6	18	★	1 1/2	1 1/2	4	1 1/2	4	4	6

- BT = Bubble Test
- PCMT = Pressure Change/Measurement Test
- HDLT = Halogen Diode Leak Test
- MSLT = Mass Spectrometer Leak Test
- ★ = 2 Hours

**NOTES:**

- (1) For Level II certification, the experience should consist of time at Level I or equivalent. If a person is being qualified directly to level II with no time at Level I, the required experience should consist of the sum of the times required for Level I and Level II and the required training should consist of the sum of the hours required for Level I and Level II.
- (2) Initial experience may be gained simultaneously in two or more methods if:
  - (a) The candidate spends a minimum of 25% of his work time on each method for which certification is sought, and
  - (b) The remainder of his work time claimed as experience is spent in NDT-related activities as defined in the employer's written practice.
- (3) Training should be outlined in the employer's written practice

# Quick Links

to ASNT Certification Documents on CD-ROM

**Recommended Practice  
No. SNT-TC-1A  
1966**

**Recommended Practice  
No. SNT-TC-1A  
1968**

**Recommended Practice  
No. SNT-TC-1A  
1971**

**Recommended Practice  
No. SNT-TC-1A  
1975**

**Recommended Practice  
No. SNT-TC-1A  
1980**

**Recommended Practice  
No. SNT-TC-1A  
1984**

**Recommended Practice  
No. SNT-TC-1A  
1988**

**Recommended Practice  
No. SNT-TC-1A  
1992**

**Recommended Practice  
No. SNT-TC-1A  
1996**

**Recommended Practice  
No. SNT-TC-1A  
1998 Addenda**

**Welcome**  
an introduction to  
**ASNT Certification Documents on CD-ROM**

**Interpreting SNT-TC-1A**  
1996 Edition

**A Guide to  
Personnel Qualification and Certification**  
by  
George C. Wheeler

**ASNT Standard for Qualification and Certification  
of  
Nondestructive Testing Personnel  
ANSI/ASNT CP-189-1995**

**ASNT Central Certification Program  
(ACCP)**