

<b>NDE PROCEDURE</b>	<b>P &amp; B TESTING, INC.</b> <small>Destructive and Nondestructive Testing</small>	PROCEDURE: PB-4000
		REVISION: A2
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SUBJECT: QUALIFYING and CERTIFYING NDE PERSONNEL		

1.0 PURPOSE

1.1 To establish the method of qualifying and certifying all P & B TESTING, INC. NDE personnel in compliance with the guidelines of ASNT recommended practice SNT-TC-1A.

2.0 APPLICATION

2.1 This procedure applies to all P & B TESTING, Inc. personnel whose specific positions require appropriate knowledge of the technical principals underlying the nondestructive test they perform, witness, monitor or evaluate. The administration of this procedure shall be the responsibility of the ASNT Level III.

3.0 REFERENCES

- 3.1 ASNT recommended procedure No. SNT-TC-1A, Latest Edition
- 3.2 Employee's qualification record.
- 3.3 P & B TESTING, INC. Quality Assurance Manual.

4.0 NONDESTRUCTIVE EXAMINATION METHODS

4.1 Qualification and certification of NDE personnel shall be applicable to each of the following methods.

- 4.1.1 Ultrasonic Testing (UT)
- 4.1.2 Liquid Penetrant Testing (PT)
- 4.1.3 Magnetic Particle Testing (MT)

5.0 LEVELS OF QUALIFICATION

5.1 There shall be three (3) basic levels of qualifications for ultrasonic, liquid penetrant and magnetic particle testing.

5.1.1 Level I

5.1.2 Level II

5.1.3 Level III

5.1.4 In the process of being qualified and certified to NDE level I, an individual shall be considered a trainee.

5.1.4.1 A trainee shall work with a Level II and shall not conduct any test independently, interpret any results of test or witness any report of test results.

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6.0 RESPONSIBILITY

6.1 Level I Individuals shall:

6.1.1 Be qualified to properly perform specific calibrations tests and examinations according to written instructions and to record results.

6.1.2 Receive the necessary instruction/supervision by a Certified Level III or his designee.

6.2 Level II Individuals shall:

6.2.1 Be qualified to set up and calibrate NDE Equipment.

6.2.2 Interpret and evaluate NDE results with respect to applicable codes, standards and specifications.

6.2.3 Be thoroughly familiar with ASNT SNT-TC-1A and limitations of the NDE methods for which he/she is certified.

6.2.4 Exercise assigned responsibility for on the job training and guidance of trainees and NDE Level I personnel.

6.2.5 Be able to prepare written instructions.

6.2.6 Be able to organize and report the results of NDE.

6.3 Level III Individuals shall:

6.3.1 Be capable and responsible for establishing techniques and procedures, interpreting codes, standards, specifications and designating the particular test methods, techniques and procedures to be used.

6.3.2 Have sufficient practical knowledge and background in calibration, materials, and fabrication and production technology to establish techniques and to assist in establishing acceptance criteria where none exist.

6.3.3 Be generally familiar with other NDE methods.

6.3.4 Be responsible for training and certifying NDE Level I and Level II personnel.

7.0 EDUCATION, TRAINING, AND EXPERIENCE REQUIREMENT

7.1 Personnel considered for certification in NDE shall have sufficient education, training and experience to insure understanding of the principles of those areas of testing in which they are being considered for certification. To be considered for certification, a candidate shall satisfy one of the following criteria for the applicable NDE level. Documented training and/or experience gained in positions and activities equivalent to those of Level I, II and/or III prior to establishment of this certification program shall be considered as satisfying the criteria of paragraphs 7.2.1 and 7.2.2.

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7.2.1 NDE Levels I and II

Table I lists the required minimum training and experience factors for initial qualification of NDE Level I and II.

7.2.2 NDE Level III

To be considered for certification as a Level III, the candidate shall satisfy one of the following education and experience criteria.

7.2.2.1 Have graduated from a minimum four year college or university curriculum with a degree in Engineering or Science plus one year experience in Nondestructive Testing in an assignment comparable to that of an NDE Level II in the applicable test method(s). A) If the college or university degree is issued in nondestructive testing, the one-year's experience requirement shall be reduced to six (6) months. Or;

7.2.2.2 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 NDE Level II in the applicable test method(s). Or;

7.2.2.3 Have four years experience in an assignment at least comparable to that of an NDE Level II in the applicable test method(s).

8.0 EXAMINATIONS

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

8.1.1 Physical

8.1.1.1 The examination shall assure natural or corrected near distance accuracy in at least one eye such that the applicant is capable of reading a minimum JAEGER Number 1, or equivalent type and size letters, at a distance of not less than 12 inches on a JAEGER Test Chart.

8.1.1.2 The examination shall demonstrate the capability of distinguishing and differentiating contrast between colors used in the applicable NDE method.

8.1.1.3 The examination shall be administered on an annual basis.

8.1.1.4 Examination results shall be documented and retained on file for the period of certification.

8.1.2 General (written) (for NDE Levels I and II)

8.1.2.1 The general examinations shall be addressed to the basic principles or the applicable NDE method.

8.1.2.2 The examinations shall contain appropriate questions concerning the applicable NDE method to the degree required by P & B TESTING, INC.

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8.1.3 Specific (for NDE Levels I and II)

8.1.3.3 The specific examinations for NDE levels I and II shall address the equipment the applicant may encounter during specific assignments.

8.1.3.4 The specific examinations shall also cover the specifications or codes and acceptance criteria used in P & B TESTING, INC. nondestructive testing procedures.

8.1.4 Practical (for NDE Levels I and II)

8.1.4.1 The candidate shall demonstrate familiarity with and the ability to operate the necessary test equipment, record, analyze the resultant information gained from the test, and make acceptance/rejection decisions based on applicable specifications, codes and/or procedures.

8.1.4.2 As a minimum, one selected specimen shall be tested and the results of the test analyzed by the candidate.

8.1.4.3 The description of the specimen, the test procedure, including check points, and the results of the examination shall be documented.

8.2 Table II describes the requirements of examinations for NDE Levels I and II for the various nondestructive testing methods.

8.2.1 The written examination shall be administered without access to reference material (closed book) except that necessary data, such as graphs, tables, specifications, procedures and codes may be provided.

8.2.2 All questions used for Level I and Level II examinations shall be approved by the responsible Level III individual.

8.3 NDE Level III examinations shall be in accordance with the following:

8.3.1 Fifteen (15) questions relating to understanding of SNFTC-1A, latest edition.

8.3.2 Twenty (20) questions relating to applicable materials, fabrication and product technology.

8.3.3 Twenty (20) questions from Level II certification examinations for other appropriate NDE methods.

8.3.4 Method of Examination that is required for each method:

8.3.4.1 Thirty (30) questions relating to fundamentals and principles, which have been selected from published ASNT Level II questions for each method, and

8.3.4.2 Fifteen (15) questions relating to application and establishment of techniques and procedures which have been selected from published ASNT Level III questions for each method, and

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- 8.3.4.3 Twenty (20) questions relating to capability for interpreting codes, standards and specifications relating to the method.
- 8.3.5 Specific Examination that is required for each method:
  - 8.3.5.1 Twenty (20) questions relating to specifications, equipment, techniques and procedures applicable to P & B TESTING, INC. method employed and to the administration of the procedures.
- 8.4 In lieu of the requirements of paragraph 8.3 Level II examination administered and graded by the American Society of Nondestructive Testing will be accepted.
- 9.0 GRADING OF EXAMINATIONS
  - 9.1 P & B TESTING, INC. QA Manager shall be responsible for administration and grading of examinations for NDE Level III personnel.
    - 9.9.1 A representative of the company may perform the actual administration and grading of Level III examinations.
  - 9.2 An NDE Level III, shall be responsible for the administration and grading of examinations for NDE Levels I and II personnel.
    - 9.2.1 The administration and grading of examinations may be delegated to a designated representative of the NDE Level III and so recorded.
  - 9.3 A composite grade shall be determined based upon the average results of the general, specific and practical examinations for Level I and II individuals, and upon the basic, method and specific examinations for the Level III.
    - 9.3.1 Examinations administered for qualification shall result in a composite grade of at least 80 percent, with no individual examination having a grade less than 70 percent.
    - 9.3.2 When an examination is administered and graded for P & B TESTING, INC. by an outside agency and the agency issues grades of pass and fail only, on certified report, then P & B TESTING, INC. may accept the pass grade as 80 percent for that particular examination.
- 9.4 Re-Examination
  - 9.4.1 Those failing to attain the required grades must wait at least thirty (30) days or show documented evidence of having received suitable additional training as determined by the NDE Level III individual before re-examination.
- 10.0 CERTIFICATION
  - 10.1 Certification of all Levels of NDE personnel is the responsibility of the ASNT Level III.
  - 10.2 Certification of NDE personnel shall be based on demonstration of satisfactory qualification as determined by the requirements of this procedure.

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10.3 The qualification records of the certified individuals shall be maintained by the QA Manager and shall include the following:

- 10.3.1 Name of certified individual.
- 10.3.2 Level of certification and test method.
- 10.3.3 Educational background and experience of certified individuals.
- 10.3.4 Evidence of satisfactory completion of the required training.
- 10.3.5 Results of the Physical Examination.
- 10.3.6 Evidence of successful completion of the required examination.
- 10.3.7 Suitable evidence of satisfactory qualifications when such are used in lieu of examinations.
- 10.3.8 Composite grade(s) or suitable evidence of grades.
- 10.3.9 Date of certification and/or re-certification and the dates of assignment to NDE.
- 10.3.10 Signature of the NDE Level III.

10.4 NDE personnel shall be issued documents which shows evidence of certification and the signature of the certifying NDE Level III individual. Copies of these documents shall be on file with the General Manager.

10.5 Re-certification

- 10.5.1 NDE LEVEL I & II personnel shall be re-certified at least once every three (3) years in accordance with one of the following criteria:
  - 10.5.1.1 Evidence of continuing satisfactory performance.
  - 10.5.1.2 Re-examination in those portions of the examinations deemed necessary by the assigned Level III individual and/or the QA Manager.
  - 10.5.1.3 NDE personnel may be re -examined any time at the discretion of the assigned NDE Level III individual and/or the NDE Supervisor and have their certifications extended or revoked.
- 10.5.2 NDE LEVEL III personnel shall be re-certified at least once every five (5) years.

11.0 TERMINATION

11.1 Any certification granted or issued by P & B TESTING, INC. shall be deemed revoked when employment is terminated.

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12.0 TRAINING PROGRAMS

12.1 Personnel being considered for certification shall 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 of the specified test method related to the level of certification desired and applicable to the practices to be used.

12.2 Training Programs shall include sufficient examinations to assure that the necessary information has been comprehended.

13.0 CERTIFICATION AND QUALIFICATION RECORDS

13.1 P & B TESTING, INC. Certification.

13.2 Employee Qualification Record.

14.0 CONCURRENCE

14.1 This procedure has been reviewed and is hereby released for the qualification of P & B TESTING, INC. personnel.

For P & B TESTING, Inc.

By: *Scott Powers*

Date: 2/1/04

Scott P. Powers, SNT Level III

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TABLE I - INITIAL TRAINING AND EXPERIENCE LEVELS  
(MINIMUM REQUIREMENTS)

EXAMINATION METHOD:	UT		MT		PT			
	LEVEL	:	I	II	I	II	I	II
Completion with a passing grade of at least two (2) years of engineering or science study in a university college or technical school.			30	40	8	4	4	4
High school graduation or equivalent.			40	40	12	8	4	8
Grammar school graduation or demonstration of proficiency, or additional training.			80	80	24	16	12	16
Work time experience (months).			3	9	1	3	1	2

NOTES:

- 1.) For Level II certification: The experience shall 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 shall consist of the sum of the times required for Level I and Level II, and the training required for Level I and Level II.
- 2.) The experience requirements are the minimum total hours of actual time working in the applicable NDE method, and is based on an individual working full time (40 hours per week/172 hours per month) in that method.

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TABLE II - GENERAL DESCRIPTION OF  
EXAMINATION FOR NDE LEVEL I AND II

A. GENERAL (written)		B. SPECIFIC (written)	
METHOD	NO. OF QUESTIONS	METHOD	NO. OF QUESTIONS
LEVEL I	LEVEL II	LEVEL I	LEVEL II
PT	40	PT	20
MT	40	MT	20
UT	40	UT	20

C. PRACTICAL

LEVEL I

A) PROFICIENCY SHALL BE DEMONSTRATED IN PERFORMING THE APPLICABLE NDT TEST ON ONE OR MORE SAMPLES APPROVED BY THE NDE LEVEL III INDIVIDUAL.

B) AT LEAST TEN (10) DIFFERENT CHECK POINTS REQUIRING AN UNDERSTANDING OF TEST VARIABLES AND P&B TESTING, INC. PROCEDURE REQUIREMENTS SHALL BE INCLUDED IN THIS PRACTICAL EXAM.

LEVEL II

A) PROFICIENCY SHALL BE DEMONSTRATED IN PERFORMING THE APPLICABLE NDT TEST AND INTERPRETING AND EVALUATING THE RESULT ON ONE OR MORE SAMPLES APPROVED BY THE NDE LEVEL III INDIVIDUAL.

B) AT LEAST TEN (10) DIFFERENT CHECK POINTS REQUIRING AN UNDERSTANDING OF TEST VARIABLES AND P&B TESTING, INC. PROCEDURE REQUIREMENTS SHALL BE INCLUDED IN THIS PRACTICAL EXAM.

**\*\*METHODS**

- LP - LIQUID PENETRANT TESTING
- MT - MAGNETIC PARTICLE TESTING
- UT - ULTRASONIC TESTING