



Infrared Certification Comparison

Definitions taken from ASNT SNT-TC-1A, the recommended practice for personnel qualification and certification in nondestructive testing:

1. **Certification:** written testimony of qualification.
2. **Certifying Authority:** the person or persons properly designated in the written practice to sign certifications on behalf of the employer.
3. **Certifying Agency:** the employer of the personnel being certified.
4. **Qualification:** demonstrated skill, demonstrated knowledge, documented training, and documented experience required for personnel to properly perform the duties of a specific job.
5. **Recommended Practice:** a set of guidelines to assist the employer in developing uniform procedures for the qualification and certification of NDT personnel to satisfy the employer's specific requirements (example: SNT-TC-1A).
6. **Training:** an organized program developed to impart the knowledge and skills necessary for qualification.
7. **Written Practice:** a written procedure developed by the employer that details the requirements for qualification and certification of their employees.

FAQ's about certification:

1. **Who can certify a person to infrared level I or II?** According to SNT-TC-1A, only the employer with a Written Practice (SNT-TC-1A section 9.0).
2. **How do I develop a Written Practice?** The employer's written practice shall be reviewed and approved by the employers NDT Level III (SNT-TC-1A section 5.4).
3. **Who can certify a person to infrared level III?** The employer with a valid Written Practice or through ASNT (ie: a valid ASNT NDT Level III or ACCP Professional Level III certificate).
4. **What do the certificates distributed by infrared training organizations represent if they aren't actual certification?** They represent the fact that the possessing individual attended the training class, possibly passing an exam, and completing some sort of report or physical exercise using the infrared camera. Final certification rests with the employer using a written practice.
5. **Where can I find more information regarding ASNT and non-destructive testing certification?** ASNT has a full library and web site. The library can be purchased through the ASNT web site, and additional information on this subject is available for free. www.asnt.org



The following checklist shows a comparison between a classroom/vendor third party “certification” and the recommended practice by ASNT.

Checklist for certification:

IDEAL Industries/Third Party Certificate	ASNT Certification Example
<ul style="list-style-type: none"> ○ Attend a 24 hour training class 	<ul style="list-style-type: none"> ○ Attend a 24 hour training class
<ul style="list-style-type: none"> ○ Pass a 60 question closed book exam with a minimum 75% grade. 	<ul style="list-style-type: none"> ○ Pass a 60 question closed book exam with minimum 75% grade.
<ul style="list-style-type: none"> ○ Complete an infrared report using the software (example: ThermalVision™) within one month upon completion of the course. 	<ul style="list-style-type: none"> ○ Employer’s ASNT Level III develops and approves the corporate written practice
	<ul style="list-style-type: none"> ○ Written practice defines the skill, experience, knowledge requirements, and documented training requirements
	<ul style="list-style-type: none"> ○ ASNT Level I individuals have attended infrared level I classes from approved companies that follow SNT-TC-1A training outlines. Example: IDEAL Industries Infrared Level I. ○ ASNT Level I individuals have passed examinations that meet SNT-TC-1A. ○ ASNT Level I individuals have at LEAST 1 month experience in the field with the aid of an ASNT Level II or higher. ○ ASNT Level I individuals have passed a 10 point checklist in the field and assessed by an ASNT Level II or higher.
	<ul style="list-style-type: none"> ○ ASNT Level II individuals have attended infrared level II classes from approved companies that follow SNT-TC-1A training outlines. Example: IDEAL Industries Infrared Level II Course ○ ASNT Level II individuals have passed examinations that meet SNT-TC-1A. ○ ASNT Level II individuals have at LEAST 1 year experience in the



	<p>field with the aid of an ASNT Level III or higher.</p> <ul style="list-style-type: none">○ ASNT Level II individuals have passed an 8 point checklist in the field and assessed by an ASNT Level III.
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Written Practice

For the Certification and Qualification of *Company "X"* Employees in the NDT Method of Thermal/Infrared

Issued:
DATE

For:
Company "X"

By:
John Doe
ASNT/PdM TIR Level III

SCOPE

This written practice establishes the minimum requirements for the control and administration of training, examination, and certification of Company "X" personnel conducting NDT using Thermal/Infrared, in accordance with SNT-TC-1A and ASTM E1934-99a, the Standard Guide for Examining Mechanical, Building Envelopes, and Electrical Equipment with Infrared Thermography.

BACKGROUND

This written practice defines the minimum requirements for education, training, experience, examination, and certification for personnel responsible for conducting nondestructive tests while in the employment of Company "X". It applies to all persons conducting nondestructive tests that meet the provisions of Recommended Practice No. SNT-TC-1A 2006 edition, in the following method: Thermal/Infrared.



DEFINITIONS

ASNT: American Society of Non-Destructive Testing. www.asnt.org

Certification: Written testimony of qualification.

Experience: Work activities accomplished in Thermal/Infrared Methods under the direction of supervision, including performing inspections and related activities but not including the time spent in organized training programs.

NDT: Non-Destructive Testing (examples include Thermal/Infrared, Vibration Analysis, etc).

Qualification: Demonstrated skill and knowledge and documented training and experience required for personnel to properly perform the duties of a specific job.

Qualitative Inspecting: The practice of observing images of infrared radiation to evaluate a structure or system's operation and locate possible exceptions.

Quantitative Inspecting: The practice of measuring the temperatures of the observed patterns of infrared radiation and using the information gained to evaluate the severity of an exception.

Shall: A verb used to express the minimum requirements of this written practice.

Should: A verb used to express the desired requirement of this written practice.

Thermography: The science and acquisition and analysis of thermal infrared data from non-contact imaging radiometers.

Training: The organized program developed to impart the knowledge and skills necessary for qualifications.

Written Practice: A document developed by the employer that states the uniform procedures and requirements for the qualification and certification of Thermal/Infrared personnel to properly perform the duties of the employer's job(s).



QUALIFICATION LEVELS

There are three basic levels of qualification used by NDT personnel at Company "X". On occasion, these levels may be further subdivided for specific situations where additional levels of skill and responsibility are deemed necessary. For example, an individual may receive specific training to perform a specific task and be certified as a Level I/II "limited" or a Level I/II "special." These subdivisions are to be addressed by revisions or addenda to this procedure, if and when the need arises.

An individual in the process of becoming qualified and/or certified to NDT Level I is considered a trainee. A trainee shall not conduct tests or interpret, evaluate, or report test results independent of a certified staff member.

Each basic level has the following responsibilities:

Level I:

1. Perform calibrations, tests, and evaluations for determining the acceptance or rejection of tested items in accordance with specific written instructions.
2. Record test results but have no authority to sign reports for the purpose of signifying satisfactory completion of NDT operations.
3. Receive instructions or supervision from a Level III or designee.

Level II:

1. Be familiar with the scope and limitations of each method for which the individual is certified.
2. Set up and check the basic calibration for the equipment.
3. Interpret and evaluate results with respect to applicable codes, standards, and specifications.
4. Organize and report the results of nondestructive tests.
5. Train and guide Level I and trainee personnel as assigned, when designated by a Level III certified in the applicable method(s).



Level III:

1. Be responsible for NDT operations to which assigned and for which certified.
2. Establish methods and test techniques and authorize use of all NDT procedures to be used on behalf of TEGG Corporation by Level I and II personnel.
3. Interpret test results in terms of applicable codes, standards, specifications, and procedures.
4. Be sufficiently familiar with electrical, mechanical, and building thermography components and systems to establish techniques and assist in establishing acceptance criteria where none are available.
5. Be generally familiar with the Vibration Analysis NDT method.
6. Be responsible (in the methods for which certified) for the training and examination of NDT Level I and Level II personnel.

EDUCATION REQUIREMENTS

Level I and II: Level I and II personnel initially certified under this written practice shall, at a minimum, have a high school education or equivalent education and for the purpose of performing infrared scans on or around the required components.

Level III: Level III personnel initially certified under this written practice shall have, at a minimum:

- a. Four years experience as a certified Level II NDT technician in the appropriate technology OR
- b. Two years experience as a certified Level II NDT technician in the appropriate technology and a two year science related degree from an accredited college OR
- c. One year of experience as a certified Level II NDT technician in the appropriate technology and a four-year science related degree from an accredited college.



TRAINING REQUIREMENTS

Level I personnel seeking to certify in accordance with this written practice shall:

- a. Complete a minimum of the three day Level I IDEAL Industries Infrared class and pass all written exams with a minimum of 75% grade OR
- b. Complete a Level I infrared course from an approved vendor passing the closed book written exams offered by the vendor with a minimum 75% grade.

Level II personnel seeking to certify in accordance with this written practice shall:

- a. Complete a minimum of the three day Level II IDEAL Industries Infrared class and pass all written exams with a minimum of 75% grade OR
- b. Complete a Level II infrared course from an approved vendor passing the closed book written exams offered by the vendor with a minimum 75% grade.

EXPERIENCE REQUIREMENTS

Level I and II personnel seeking to certify in accordance with this written practice, shall meet the necessary field experience using the appropriate equipment for the test method. A Company "X" ASNT/NDT or PdM Level III or his/her designated Level II must verify proper experience. Experience must include at least one thermal/infrared or vibration scan completed and checked for correctness for a client. Table I below shows the experience requirements.

Table I: Initial Experience Requirements, Levels I and II

NDT Method	Level I	Level II
Thermal/Infrared	3 months	12 months
Vibration Analysis	3 months	12 months



EXAMINATIONS

Vision Examinations: All Level I, II, and III personnel shall be given an annual vision examination to assure natural or corrected near-distance acuity exists in at least one (1) eye. The individual shall be capable of reading a Jaeger Number 2 or equivalent type and size letters at a distance of not less than 12 inches. Where differentiation of colors is critical to job performance, the capability to distinguish and differentiate contrast between the applicable colors shall be demonstrated. Re-examinations are necessary every five (5) years.

General Examinations. Each Level I and II candidate shall be given a general, objective type (for example, multiple-choice) written examination addressed to the basic principles of each method for which certification is sought. This examination will either be administered as part of the organized training program (when feasible) or given separately when experienced personnel are being examined for recertification or for initial certification when coming from a former employer and complying with this written practice. The content of the general examination shall meet or exceed the example questions in the applicable SNT-TC-1A Supplement. The Supplement questions are intended only as examples. They should not be used verbatim for qualification examinations.

Candidate personnel shall have access to questions only at the time of the examination. This examination shall be closed-book; however, necessary data, such as graphs, tables, specifications, procedures, and codes may be provided. The security of the examination program is vested with the responsible Level III individual, including development, selection, and grading the examination questions. Table III summarizes the minimum number of examination questions to be included in each written examination.

Specific Examination. Each Level I and II candidate shall be given a specific, objective type (for example, multiple-choice) written examination addressing the equipment, operating procedures, and test techniques that the personnel may encounter in their specific job assignments. The examination shall address key electrical component infrared scanning identification and false anomalies and ASTM 1934-99a as part of routine testing operations. This examination shall be closed-book; however, necessary data, such as graphs, tables, specifications, procedures, and codes, may be provided.

This examination will either be administered as part of the organized training program (when feasible) or given separately when experienced personnel are being examined for recertification or for initial certification when coming from a former employer and complying with this written practice. The content of the specific examination shall be constructed to evaluate the ability of the candidate to effectively use the applicable specifications, codes, etc. to perform and/or evaluate the results to the degree necessitated by the anticipated qualification level.



Practical Examination. Each Level I candidate shall be given a practical "hands-on" examination that demonstrates the candidate's ability to perform specific calibrations, specific tests using thermal/infrared or vibration analyzers, and specific evaluations for acceptance or rejection determinations in accordance with Company "X" policies. At least one (1) specimen shall be tested and the results analyzed by the person considered for certification. Selection of the specimen shall be made by the NDT Level III individual and performance shall be measured based on at least ten (10) performance check points (See FORM 1).

Each Level II candidate shall be given a practical "hands-on" examination that demonstrates the candidate's ability to set up and perform calibrations using (insert necessary equipment), interpret and evaluate results in accordance with (insert employer's applicable specifications, codes, standards, etc.), and organize and report the results of the test. At least one (1) specimen shall be tested, and the results analyzed by the person considered for certification. Selection of the specimen shall be made by the NDT Level III individual, and performance shall be measured based on at least ten (10) performance check points (See FORM2).

Grading of Written and Practical Examinations. The results of each candidate's examination (general, specific, and practical) are to be combined into a composite score for which a score of 75 percent is the minimum required for qualification.

The grading and administration of the examinations shall be the responsibility of the designated Level III, certified in the method(s) and who shall approve the use of all Level I and II questions, the practical test sample(s), and the performance check points. However, administration, monitoring, and scoring of examinations may be delegated to (insert suitably qualified individuals).

Those failing to attain a composite grade of 75 percent or higher shall be prohibited from taking a re-examination for the following thirty (30) calendar days, unless evidence of having received suitable additional training is presented, thus allowing an earlier re-examination to be given. (The minimum requirements for additional training should be detailed, for example, 48 hours *the minimum time between examinations*type of training, and method of documentation.)



Requirements for NDT Level III Qualification:

An individual can qualify as an NDT Level III at Company "X" by satisfying one (1) of the following criteria (select those which apply):

1. Have obtained a degree in engineering or science from a college or university (four (4) year curriculum, minimum), plus a minimum of one (1) year of experience comparable to Level II in the method or methods for which being certified, or
2. Have satisfactorily completed two (2) years of technical training (engineering or science at a university, college, technical school), plus two (2) years of experience comparable to a Level II in the method or methods for which being certified, or
3. Have four (4) years of NDT experience in an assignment comparable to that of an NDT Level II in the method(s) in which certification is sought.

In addition, pass a Basic, Method, and Specific Level III examination, to be administered by ASNT or by a recommended Thermal/Infrared or Vibration training institute.

CERTIFICATION

The NDT Level III of Company "X" is certified by the current or acting President upon satisfactory presentation of documentation showing evidence of qualification in accordance with this written practice, in the method(s) for which certification is being applied. When outside service groups supply Level III services, the responsibility for assuring that these service groups satisfy the requirements of this written practice on an ongoing basis remains with the Company "X" representative.

The Company "X" representative/NDT Level III shall certify Level I and Level II individuals, upon their satisfactory completion of the training, experience, and examinations required by this written practice.



RECERTIFICATION

All Level I and II NDT personnel shall be recertified every five (5) years based upon evidence of continuing satisfactory performance as judged and documented by the certified NDT Level III for the applicable method. Where a weakness is identified by the NDT Level III in the technical performance of an individual, supplemental training, and specific examinations may be used, at the discretion of the NDT Level III, to upgrade the individual prior to completion of recertification.

Level III personnel shall be recertified every five (5) years based upon continuing satisfactory performance as judged by the Company "X" Training Manager.

Termination of Certification

The certification of all NDT personnel shall terminate upon a period of one (1) year during which no NDT-related work is performed in the method(s) certified.

All NDT certification of personnel leaving the employment of Company "X" is revoked at the time of the employee's separation.

Documentation

The NDT Level III is responsible for the gathering and organization of all documentation relating to the overall NDT program at Company "X". Included in the documentation to be maintained as part of objective evidence for the NDT program at Company "X" are the following:

1. This written practice;
2. Authorizations designating and certifying Level III individual(s);
3. Authorizations certifying Level I and II individual(s);
4. Statements indicating basis of authority, including biographical sketches listing education, training, and experience related to NDT; and
5. Statements indicating current status regarding annual vision examinations and recertifications.



REFERENCES

1. Recommended Practice No. SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing," December 1996 edition.
2. 1998 Addenda to SNT-TC-1A
3. SNT-TC-1A Questions and Answers: Inquiries to and Responses from ASNT's SNT-TC-1A Interpretation Panel, current edition.
4. ASTM E1934-99a: Examining Electrical and Mechanical Equipment with Infrared Thermography.



**FORM 1: Company “X” Practical Exam Checklist
For ASNT-Thermal Infrared Level 1 Certification**

	Category	Pass	Fail
1	<i>Trainee shows proper use of camera focus.</i>		
2	Trainee is able to correctly set level and span for use of obtaining a clear image of each component.		
3	Trainee identifies at least one thermal exception (anomaly) during a thermal scan of operating equipment.		
4	Trainee uses camera temperature measurement to gather quantitative data from a thermal infrared exception.		
5	Trainee compares thermal exception temperature with appropriate reference point (ambient or similar component under similar load) and refers to proper Company “X” severity criteria to determine exception criticality.		
6	Trainee uses good emissivity judgment by taking temperature measurements on a component that has the best emissivity.		
7	Trainee shows awareness of being within the thermal infrared camera’s dynamic range (ie: -14 to 660°F).		
8	Trainee shows awareness of being within correct MFOV for good temperature measurements.		
9	Trainee correctly identifies a true thermal pattern (conductive or convective).		
10	Trainee correctly identifies a reflected apparent temperature and proves it is NOT a thermal infrared exception.		

Trainee meets or exceeds Company “X” Level I thermal infrared practical standards:

Authorized Company “X” Level I

Authorized Company “X” Level II or III