

What is Non-Destructive Testing?

Non Destructive Testing (NDT) plays a very important role in assuring that structural, piping, Manufacturing & Mechanical Components perform their functions in a safe, reliable and cost effective manner. NDT Technicians perform the necessary tests to locate the Indications, Defects and Discontinuities that may cause failures / Shutdown / in such system. These tests are performed in a manner that does not affect the future usefulness of the object or material being tested- hence the name “nondestructive”. NDT Tests allows a careful and thorough examination, evaluation and Interpretation without the need for reconstruction or damage. NDT is typically used in various points in a part's life cycle or Human life cycle; NDT can be used prior to the use of component for meeting the requirements of Quality Control and Assurance. NDT can also be used while components are in use to detect In-service related conditions caused by Wear, Fatigue, corrosion, Erosion, Stress or other several factors which affect reliability & use of components or part.

NDT Certification Schemes:

To demonstrate or to Inspect or to Test or to Evaluate the NDT methods Qualification & Certification of personnel competence is mandatory as per the relevant national & International standards / Code or Specification. Certifying Bodies / Schemes meeting the requirements of accreditation for certifying personnel to NDT as per ISO 9712- 2012 / SNT-TC-1A (2016), ANSI/ASNT-CP189 (2011), ASME-NQA-1 (2016), NDT methods are classified as Surface and Sub surface methods and as mentioned below:

Certification Bodies / Schemes:

American Society for Non-Destructive Testing (ASNT-USA)
 American Society for Mechanical Engineers (ASME-USA)
 British Institute of Non-Destructive testing (BINDT-UK)
 Certification Scheme for Welding & Painting Inspection (CSWIP-UK)
 Australian Institute for Nondestructive Testing (AINDT-Australia)

NDT Methods: -

- Acoustic Emission testing
- Liquid Penetrant Testing
- Laser Testing
- Magnetic Flux Leakage
- Radiography Testing / Computed Radiography
- Thermal / Infrared Testing
- Ultrasonic Testing
 - Conventional/ Digital Ultrasonic testing
 - Phased Array Ultrasonic Testing (PAUT)
 - Time of Flight Diffraction (TOFD)
 - Long Range Ultrasonic test (LRUT)
 - Short Range Ultrasonic Test (SRUT)
 - Guided Wave Testing
- Visual Testing
- Electro Magnetic Testing
- Leak testing
- Magnetic Particle Testing
- Neutron Radiography

The above methods can be applied to different product sectors (Welds, Castings, Forging, Wrought, Rails, Forgings, Aerospace & In-Service Inspection

The NDT method(s) training will be followed by an examination to ensure that all candidates have acquired adequate knowledge in the specific NDT method and skill in particular NDT Method operation.

As per ASNT recommended practice SNT-TC-1A, 2016 the candidates for Level II certification programs & I should appear for the following examinations separately for each NDT method after successful completion of the training course(s):

General Examination:

Covers the basic principles, theory, applications of the specific NDT method

Specific Examination:

Tests ability to read, interpret and apply specific procedure, code, specification for the method

Practical Examination:

Hands-on demonstration of the ability to operate test equipment, perform specific calibrations and tests in order to find and report flaws of sample materials according to appropriate specifications or procedures and instructions

Viva Examination: .

Candidates ability on practical & Theoretical knowledge along with codes, standards & Specifications will be evaluated for 15 minutes.

Successful candidates will be awarded the certificates in the method certified after evaluating the examination results.

Following are the minimum requirements for an individual to acquire a NDT Level II Certification in a specific method as per SNT-TC-1A, 2016 All requirements have to be met.

Education - High school or Equivalent

Organized NDT Training Program with required hours. The training program to include sufficient examinations to ensure understanding of necessary information (Section 7.0 of SNT-TC-1A)

Experience as per SNT-TC-1A - to be verified by Employer.

Eye Examinations (near vision and color contrast) performed annually (see Section 8.2 of SNT-TC-1A).

Examinations conducted as per employer's written practice - General, Specific and Practical with with minimum number of questions. (see Section 8.0 of SNT-TC-1A)

Table 1. Training and Experience Requirements to be a NDT Level-II as per SNT-TC-1A 2016. Example - To be a MT Level II, an individual must have 20 hours of class room training, 280 hours of MT experience and 530 hours of total NDT experience

DESCRIPTION	PT	MPT	VT	UT/RT/ET/PAUT
Training	12 hours	20 hours	24 hours	80 hours
Experience - Method	210 hours	280 hours	210 hours	840 hours
Experience-Total NDT	400 hours	530 hours	400 hours	1600 hours

NOTE: Certification of all levels of NDT is the responsibility of the employer (9.1 of SNT-TC-1A)

Level I:- Qualified to perform specific calibrations, specific NDT, specific evaluations, and record results. Should receive specific instruction or supervision from a NDT Level II or III.

Level II:- Qualified to set up and calibrate equipment and interpret and evaluate results as per applicable codes, standards and specifications. Should be familiar with technique limitations. Organize and report the results. Should exercise assigned responsibility for on-the-job training and guidance of trainees and Level I personnel.

Level III:- Qualified to develop, qualify and approve procedures, establish techniques, interpreting codes and standards. Should have sufficient practical background in applicable materials, fabrication and product technology. Should be capable of training and examining Level I and Level II Personnel.

NDT Method	Level	No of Training Hours	Experience Minimum Hours in Method	Experience Total Hours in Method
PT	L1	4	70	130
	L2	8	140	270
MPT	L1	12	70	130
	L2	8	210	400
UT	L1	40	210	400
	L2	40	630	1200
RT	L1	40	210	400
	L2	40	630	1200
VT	L1	8	70	130
	L2	6	140	270
UT - PAUT	---	---	---	---
	L2	80	160	N.A.
UT - TOFD	---	---	---	---
	L2	40	160	N.A.
MFL	L1	16	70	130
	L2	12	210	400
EMT - ACFM	L1	40	210	400
	L2	40	630	400
EMT - Eddy Current	L1	40	210	400
	L2	40	630	1200
EMT -Remote Field	L1	40	210	400
	L2	40	630	1200

Table 6.3.1 A - Recommended Initial Training & Experience Levels