

INDIAN SOCIETY FOR



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www.isnttrichy.org

Waves

*The Technical Bulletin of Indian Society for Non-Destructive Testing
Tiruchirappalli Chapter*

HIGHLIGHTS

- Messages from Chairman, Secretary, Vice chairman.
- Advanced ultrasonic imaging techniques in-lieu of Radiography for evaluating structural integrity of welds.
- NDT Certification.
- New trends in NDE personnel training and certification schemes.

December is here!!!

The first newsletter of ISNT Trichy Chapter focuses on the latest developments and research happening in the field of NDT. As a long cherished dream of the members come true, let us keep up the spirit and advance forward to create more innovative and fruitful contents in the upcoming issues.

Wishes,

The Editorial Committee



ISNT –TIRUCHIRAPPALLI CHAPTER

Membership strength of ISNT Trichy chapter		
Sr. No.	Category	Number
1	Life Fellow Members	2
2	Life Corporate Members	13
3	Life Members	301(Recently added-3)
4	Members	6
5	Associate Members	6
6	Corporate member	1
7	Student Members	1 (Recently added)
	Total	330#

#Inclusive of four new members (added in 2021).

Summary of training programs:

ISNT courses : Courses completed in -2021

Package programmed for students of the 'one year post graduate program' conducted by WRI, BHEL in association with PSG college of Tech, Coimbatore.

Level – II in RT, UT, MT & PT.

UT – 25.08.2021 to 07.09.2021

MT – 16.12.2021 to 22.12.2021

RT– 23.12.2021 to 03.01.2022 (under progress)

PT- will starts 04.01.2022

A total of 13 No's of candidates in each programs have participated.

Radiation Safety for Industrial Radiographer Course- 18.10.2021 to 29.10.2021- 37 candidates

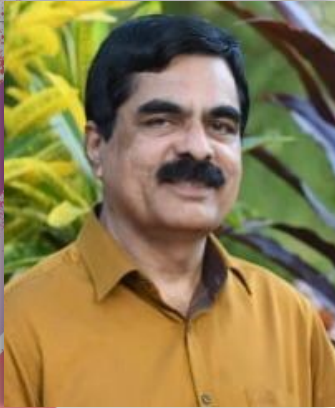
Courses & workshops planned for the year 2022(Tentative)

- Package programmed for students of the 'one year post graduate program' conducted by WRI, BHEL in association with PSG college of Tech, Coimbatore. Level – II in RT, UT, MT & PT. Tentative period: April – June 2022
- ECT Level II- Jan/February 2022
- PAUT Level II- February/march 2022
- PAUT and TOFD workshop in the month of April-2022.
- One year NDT training programme for employee wards in association with BHEL educational society. Level – II in RT, UT, MT & PT. Tentative period: June – July 2022.
- BARC radiographers - **Radiation Safety for Industrial Radiographer**-certified course (9 days' program). Tentative period: February/March 2022 & August 2022.
- Level II programs in RT, PT, MT, PT radiographic film interpretation, depending upon the demand.
- Any package programs depending upon the requirement and availability of time slot.

Note : all the above programs are tentative only and it will be organized only after getting the minimum participants.



Chairman's Message



Industry 4.0, or the fourth industrial revolution, as it is called, is emerging globally as a powerful force and is being touted as the next industrial revolution. Industry 4.0 is a conglomeration of many futuristic and advanced concepts and technologies which have the potential of transforming the production scenario in the 21st century, mainly comprising of a “connected shop floor”, where data is collected from various sensors and other input devices to be used for better control, predictive maintenance and long term analysis.

Industry 4.0 is characterized by the increasing digitalization and interconnection of products, value chains and business models. It is driven by an amalgamation of emerging technologies like data volumes, computational power, Industrial Internet of Things (IIoT), business analytics, augmented reality, artificial intelligence, elemental design, simulation, advanced robotics, additive manufacturing, sensor based technologies and cyber-physical systems. Industry 4.0 would mean the convergence of real and virtual worlds – the next phase in bringing together conventional and modern technologies in manufacturing. This will result in the “Smart Factory”, which is characterized by versatility, resource efficiency, ergonomic design and direct integration with business partners.

This will lead to big changes in the field of Non-Destructive Examination (NDE) as there is a remarkable interaction between the fourth revolution in NDE (NDE 4.0) and the fourth industrial revolution (Industry 4.0). In the process, NDE 4.0 benefits from Industry 4.0 and Industry 4.0 benefits from NDE 4.0. First, the Industry 4.0 emerging technologies can be used to enhance NDE technologies and NDE data processing. Second, a statistical analysis of NDE data provides insight into reliability, inspection performance, training status, consistency and value of the inspections. Finally, NDE is the ideal data source for Industry 4.0.

Industry 4.0 is adopting a wide array of emerging technologies, as indicated earlier, that enhance the current NDE methods, resulting in NDE 4.0. NDE 4.0 is a product of the improvement of NDE equipment based on the user behaviors and user feedback on the equipment. Another aspect of Industry 4.0 for NDE 4.0 pertains to various aspects of controlling the inspections. There are various measures and standards that must be taken in to consideration, such as the implementation of revision-safe data storage. This can be achieved through block chain use and by use of digital component files and the identifiers of electronic components for component identification. Additionally, IIoT technologies and interfaces support digital workflow by allowing electronic transfer of job descriptions. The interfaces also facilitate the improvement of digital commissioning by enabling transfer of the order-related information. The results of the statistics generated and test feedback loop, service inspection results and the testing of End Of Life components assist quality assurance experts, including NDE inspectors, to be more accurate when establishing the value and reliability of an inspection. The NDE 4.0 technology can also be beneficial for the industry for Easier Data Transfer, Better Data Evaluation and Manufacturing Process Improvement.

As our country is fast progressing for boosting Make in India initiative to facilitate various technological development, foster innovation, enhance skill development and build best-in-class manufacturing infrastructure in the country, we, the members of NDE fraternity have a major responsibility of transforming ourselves and adapting to the new ways. So, we all need to align ourselves for fulfilling the national mission and for that, we all need to encompass a vast spectrum from Conventional to Advanced NDE including novel methods, instrumentation, NDE automation, robotics, sensors, procedures and data analytics as applied to all industry segments for quality assurance & control, periodic maintenance, life estimation, structural integrity and related areas. We shall also ensure that ISNT serves as a premier provider of NDE related information including publications, references, archives, training, and conferences. We shall also put all out efforts for the growth of ISNT through partnership with industry, government, professional organizations and educational institutions.

In this context, I am extremely happy to note that ISNT (Trichy Chapter) is publishing a quarterly e-news bulletin named “WAVES” and the first issue of the same is being released in the Annual General Body Meeting of the Chapter on 26th December 2021. I congratulate and complement all the members who have contributed for the same directly or indirectly and also wish it a great going.

Wish each one of you an advance Happy New year 2022.

Stay Safe & Healthy

Thank you all.

Revisankaran U
Chairman



Secretary's Message



Need of hour:

NDE is the incubated landscape in the industrial world with a potential to change the paradigm of challenge in inspection and its delivered benefits.

Our country is fast progressing for boosting Make in India initiative, Digital India, Startup India, Woman empowerment to facilitate various technological development, foster innovation, enhance skill development, and build best in class manufacturing infrastructure in the country, we the members of NDE fraternity have a major responsibility of transforming ourselves and adapting to the new ways. NDE is playing a pivotal role by evaluating the state of the material and providing valuable information to prevent catastrophic failures and to ensure safety, reliability & sustainability of business.

Changing times have brought in significant changes and challenges in the manufacturing processes & operation in almost all the sectors viz., nuclear, aerospace, power, automotive etc. Consequently, the NDE science and technology also has evolved over the years, coping up with the increasing stringent quality norms.

NDE 4.0 is the buzz word you would have started hearing in various forums since the last couple of years and is strongly linked to the industry 4.0. Industry 4.0 is the name given to the fourth industrial revolution which takes the digital revolution to the next level. So, our responsibilities are going to increase year by year.

Now, paradigm shift is the need of hour for acquiring the insight knowledge, competency & understanding of the following:

Also, Human Safety and well-being of every citizen is a high priority. Today we have an aging infrastructure, and a high

Industry 4.0 for NDE

- Artificial Intelligence / Machine Learning / Deep Learning
- Big / Smart Data Processing and Visualization
- Cloud Computing
- Augmented / Virtual / Mixed Reality
- Block chain
- 5G
- Quantum Computers
- Enhanced Robotics/Drones
- Revision-Safe Data Formats and Storage

Human Considerations & Path Finding

- Purpose and Value Proposition of NDE 4.0
- NDE 4.0 Business Models
- Management and Leadership 4.0
- Digital Transformation and Organization Behavior
- Training and Certification

NDE for Industry 4.0

- Digital Twin
- Industrial Internet of Things
- Data Security/Sovereignty
- Semantic Interoperability
- Additive Manufacturing
- Reliability
- Predictive and Prescriptive Maintenance
- Probabilistic Analysis
- Trending / Feedback Loops

- Standards and Best Practices
- Human Factors
- Human-Computer Interaction
- Technology Development and Validation

cost is attached for its replacement. The challenge of the day is to maintain and extend the design life of components of our infrastructure. Women empowerment in field of NDE is major concern of the present situation.

So, we need to gain the capabilities to salvage the NDE challenges of industrial 4.0. NDE 4.0 can transform the world of manufacturing, assembly, inspection, maintenance, assets integrity and performance management, risk-based inspections, PSI, ISI, life assessment etc.

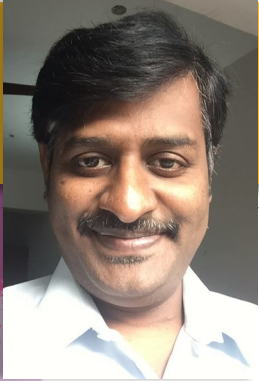
The trust and confidence of our society stalwarts, our valued members, have been the vital fuel in our unstopping journey of steady growth and improvement.

Let us focus together & contribute to achieve national goal.

Thanking you all!!!!

Stay Safe and Healthy.

Dilip Kumar Singh
Secretary



TRICHY'S EFFORTS IN NATION BUILDING WITH ISNT TRICHY CHAPTER BEING THE BACK BONE

Tiruchirappalli is a major engineering equipment manufacturing hub in Tamil Nadu. High Pressure Boiler manufacturing plant was set up by the Bharat Heavy Electricals Ltd (BHEL), India's largest public sector engineering company, in May 1965. The plant has a capacity to manufacture power boiler equipment, which can generate up to 10,000 megawatts of electricity every year using coal as a fuel.

BHEL/Trichy, a pioneer in Power boiler manufacturing had supplied 193GW of power equipment worldwide and also had exported 11GW of power boilers in overseas market.

BHEL/Trichy works with steam parameters of around 250 Ata and 598⁰C, which involved manufacturing of high pressure components as thick as 200 mm steel. Challenges were multi-fold during NDE testing of welds and raw materials in the initial phases of manufacturing and testing.

A lot of base work in the form of developing expertise in the field of Welding, Heat Treatment, NDE and exclusive Quality Management systems were required to cater the ever increasing power demand of the nation.

ISNT Trichy chapter is strategically located at the banks of Cauvery river, catering to the NDE personnel qualification requirements of Trichy - India's leading Infrastructure Hub.

ISNT Trichy is a unique chapter having located in a Non-metro city to establish itself in a self-proclaimed way by continuously working on the vision of ISNT to promote the awareness of NDT Science and Technology through education, research and exchange of technical information within the country and internationally among its members and other professionals using NDT.

ISNT Tiruchirappalli Chapter regularly organizes Technical Lecture Series, Field Trips, awareness training for students, Seminars/workshops, ASNT Level III refresher courses, NDT qualification of SNTTC 1A ASNT Level I, II, III, by training and examination, etc.,

Currently ISNT Tiruchirappalli chapter family has grown to 400 plus members, where young NDT professionals can meet stalwarts of NDT technology and manufacturers of NDT Equipment. We had developed around 1500 NDT Level II qualified individuals in the past 4 Decades of our service.

To the feather on the cap, ISNT Trichy chapter has the privilege of conducting BARC Radiography operators course imparting mandatory safety training for operating Industrial Radiography Exposure Devices.

ISNT Trichy is one of the very few chosen locations among the 5 Institutes in India to handle this statutory course as per AERB regulations. In fact, ISNT Trichy is the only institute in South India authorized to conduct this course.

The training course is conducted as per the guidelines of ISO-9712. Industrial radiographers are responsible for the operation of radiography camera. On successful completion of the training course, the approval is issued to the candidates to work as certified-radiographers. It is mandatory to employ the certified radiographers only, for carrying out industrial radiography. It is noteworthy that, ISNT Trichy has trained and certified 147 persons in Radiological Safety course in last five years.

And our service to the nation continues in

- Creating appetite for NDE through organizing Technical Lecture Series, Field Trips, awareness training for students, Seminars/ workshops, training
- Qualifying personnel for different NDE methods like RT, UT, MT & PT and developing Industrial radiographers to cater the Industry demands.



Waves

Annual General Body Meeting (AGM-2021)

Annual general body meeting - 2021 was conducted at Institute of Engineers Hall, Ganesha Circle, Trichy on 26.12.2021.



Advanced ultrasonic imaging techniques in-lieu of Radiography for evaluating structural integrity of welds

Dr. R J PARDIKAR, Chief Manager-NDT, TWI India Pvt. Ltd
Formerly President-ISNT, GM, BHEL-Trichy

Assessment of integrity of engineering components and structures is becoming increasingly important for both economic and safety reasons. It is now widely accepted that all welded components and structures possess "defects" from the start of their service life (this forms an important and initial assumption in fracture mechanics). Defect assessment is the way to control structural integrity reliably.

Radiography has been extensively deployed as an imaging technique for evaluation of welds as per the national and international codes and standards for many years. The requirements of radiography are well known and documented by the ASME code. However, Film radiography has its limitations, including radiation hazards, inefficiency in detecting planar discontinuities and inability to locate and size defects. Low detection rates for critical planar defects (i.e. cracks and lack of fusion), high capital investment on X-ray/gamma ray equipment and recurring expenditures on photographic films. Conventional UT has been used to locate size and confirm the indications found in radiography testing. In the case of conventional ultrasonic testing, reflectivity of signals is normally the basis for the manual pulse/echo technique. This manual testing is also subject to severe limitations, including dependence on human skill and experience, operator integrity, grain structure of the material and orientation of the discontinuities. No vertical sizing capability.

The advances in modern computer hardware and software have had a substantial effect on the analysis and display of ultrasonic data. The ultrasonic imaging techniques such as time of flight diffraction and phased array have been developed to overcome some of the limitations imposed by the conventional testing methods. The important advantages of the ultrasonic imaging technique are high reliability, high sensitivity and the effective detection and characterization of even disoriented discontinuities that are difficult to detect with the manual ultrasonic and radiographic techniques.

Careful preparation of scan plan with appropriate coverage & angles of PAUT & TOFD can detect all flaws that are likely to occur during the welding, thus increases the reliability of test. Scan plan, procedure, equipment, accessories, scanners, encoders etc. are needed to be established and validated on a mock up with all probable defects before allowing the same on actual welds.

Today Ultrasonic Examination (UT) is a permitted volumetric examination method in lieu of the required Radiographic Examination (RT) of ASME Boiler and Pressure Vessel Code, Sections I, VIII Division 1 and VIII Division 2. It is important to note that for all three code books, the permitted ultrasonic examinations are restricted to Time of Flight Diffraction (TOFD) and Phased Array (PAUT) with computer based data acquisition and analysis abilities using automatic or semi-automatic equipment that is mechanically mounted and guided on the examination surface. Manual straight beam UT, manual angle beam UT and manual Phased Array (PAUT) are not permitted as substitute techniques when using UT in place of required RT.

ASME section I permit UT in place of RT by utilizing Code Cases 2235, 2816, or by using PW-52.1. Code Cases 2235 and 2816 utilize fracture mechanics based acceptance criteria, while PW-52.1 references Section V, Article 4, Mandatory Appendix VII, which uses workmanship based acceptance criteria. While the acceptance criteria are different, in all three cases, the use of TOFD or PAUT using equipment mechanically mounted and guided on the examination surface either through automatic or semiautomatic means is required.

ASME Section VIII Divisions 1 and 2 likewise permit UT in lieu of the required RT. Section VIII Division 1, UW-51(a)(4) states that this UT must meet the requirements of Section VIII Division 2, paragraph 7.5.5. As a result, a Certificate Holder performing UT as permitted in UW-51(a)(4), needs to have access to a Section VIII Division 2 code book. UW-51(a)(4) further references Section V, Article 4, Mandatory Appendix VIII, which utilizes fracture mechanics based acceptance criteria in conjunction with Mandatory Appendix IX. Mandatory Appendix VIII, paragraph VIII-431 requires that ultrasonic examination must be performed, "using a system employing automated or semi-automated scanning with computer based data acquisition and analysis abilities". Equipment with computer based data acquisition and analysis abilities is either TOFD or PAUT.

Specifically, this combination has proven that this is more suitable for thick structures (above 13mm). Although TOFD is more often utilized for inspecting welds with simple geometry and fine grain steels, such as welds with thicknesses from 13 mm to 300 mm, it is useful in inspecting more complex geometries.

Defects like cracks, lack of penetration, lack of fusion, porosity, and slag in welds of pressure vessels could be diagnosed via this technique very precisely. The most suitable technique for the complete volume coverage of heavy wall thickness & Nozzle joints and coverage of the weld and heat affected zone would be combined phased array ultrasonic testing (PAUT) and TOFD together which also meet the code (ASME Code Case 2235, ASME Section VIII DIV 1 & DIV 2) requirement.

Although TOFD and PAUT use different principles for detection of defects, they have their own strengths and weaknesses. Phased array works on reflection technique where as TOFD (Time Of Flight Diffraction) works on diffraction technique. Used together, the two techniques reinforce each other, increasing the probability of detection, reliability of inspection and significant reduction in falls calls and inspection time.

NDT Certification

Dharmveer Singh
Regional Technical Manager - ME
Stork, a Fluor Company

WHAT IS NDT?

Nondestructive Testing (NDT) is a testing and analysis technique used to evaluate the material's integrity without causing damage to the original part. There are several Nondestructive methods available worldwide. Each method has its own advantage and limitations. MT, PT, RT, UT, VT and advanced NDT methods are the ones used mostly.

WHO CAN PERFORM NDT?

Being a very specialized area, each method is to be performed by a trained and certified personnel. No untrained and No un-certified personnel is allowed to perform NDT.

WHAT ARE THE NDT LEVELS

There are three levels of certification in NDT as per most of the standard and guidelines used in world-wide. In general following are the NDT Levels.

NDT LEVEL I are generally 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

NDT LEVEL II are 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

NDT LEVEL III are 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 II personnel.

WHAT ARE THE TYPES OF NDT CERTIFICATION IN NDT?

Fundamentally there are three levels of the NDT certification. First Party; Second Party and Third Party Certification

FIRST PARTY CERTIFICATION

The certification issued by the organization of the employee. This is commonly known as Employer Based Certification. The employer prepares a written procedure for the training, examination and certification based on certain guidelines or standards. Two of the most popular guidelines and standards are SNT-TC-1A and CP-189 from ASNT (American Society for Nondestructive Testing). The candidate should meet certain requirements before they are certified to any method for any level and those requirements are

- Vision Exam-(Usually Color Vision, Near Vision)
- Experience - Working in certain hours in the method to be certified .
- Training - Each candidates are to go through certain hours of the training for the given method

Examination - There are generally 3 examination conducted

- General Examination (Closed Book)
- Specific Examination (Open and/or Closed Book)
- Practical Examination (Practical exposure on the defected Samples)

Once above minimum requirements are met and passed the examination, candidates are certified to any NDT Level.

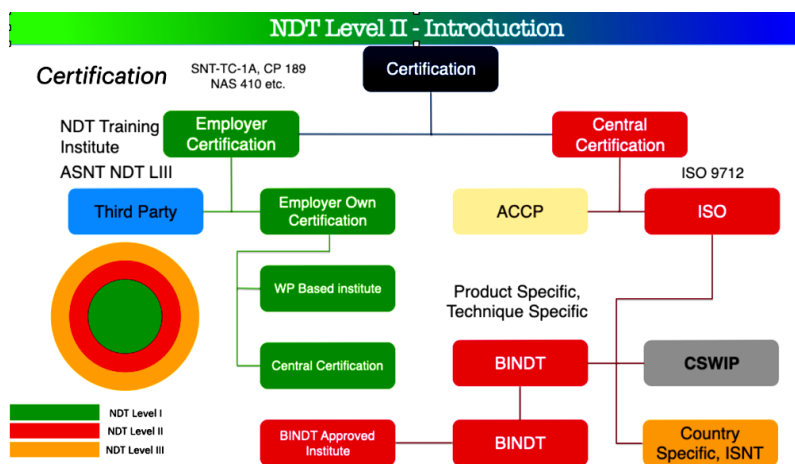
SECOND PARTY CERTIFICATION

The certification, provided by the customers in order to perform NDT are called second party certification. Customer takes all the exams as guided by their procedure, prepared according to the international or national guideline.

THIRD PARTY CERTIFICATION

The certification where training, experience, examination are conducted by some third organizations (other than employer and customer) are generally know as third party certification. Mostly those are guided by the standard ISO 9712. ISNT, BINDT, CSWIP are some of the organizations which conducts the training and provide the certificates based on ISO 9712

Usually European countries use NDT - Nondestructive Testing for certification and method while American concept is to use NDE - Nondestructive Evaluation in place of NDT.



NEW TRENDS IN NDE PERSONNEL TRAINING AND CERTIFICATION SCHEMES

B K Sethupathy, Manager-BHEL, NDT Level III, BHEL , Tiruchirappalli



Non Destructive Testing plays a vital role in almost all manufacturing, construction and process industries in assuring quality of the product. Proper NDE avoids any catastrophic or service failure in time and provides safety to the personnel involved and extends the life of equipment too.

In order to become a successful NDE Practitioner, one should primarily undergo an organized training and certification program. Many National and International organizations have developed their own certification schemes to enable the employers to train and certify their personnel. The following are few popular NDE certification schemes

ASNT SNT TC 1A	ISO 9712	BIS 13805	PCN
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The above all Certification schemes updates the training and certification requirements periodically in every edition for further improvement. But most of the certification schemes specify one thing in common *ie.* Employer holds the primary responsibility in Certifying their personnel. Let's go through few comparisons:

SNT TC 1A (2016 & 2020)					ISO 9712 2012				
It allows qualified Level II to perform, interpret, evaluate and report test results independently.					It allows qualified Level II to perform, interpret, evaluate and report test results independently.				
Total Training Hours					Total Training Hours- Industrial Sector				
RT	UT	MT	PT	VT	RT	UT	MT	PT	VT
80	80	20	12	24	120	120	40	40	40
Examination-Minimum Number of questions					Examination-Minimum Number of questions (Industrial Sector)				
Method	General	Specific	Practical		Method	General	Specific	Practical	
RT	40	20	Note 1		RT	40	30	Note 2	
UT	40	20	Note 1		UT	40	30	Note 3	
MT	40	20	Note 1		MT	30	30	Note 3	
PT	40	20	Note 1		PT	30	30	Note 3	
VT	40	20	Note 1		VT	30	30	Note 3	

Note 1: At least one flawed specimen to be tested hands on by the candidate

Note 2: At least two flawed specimens to be tested hands on and 12 no. of radiographs to be evaluated by the candidate

Note 3: At least two flawed specimens to be tested hands on by the candidate

SNT-TC-1A	IS13805
Decentralized Certification system for Level I & II Allows Employers to train and certify Level I & II personnel Centralized Certification system for Level III. Only ASNT certifies Level III personnel by examination.	Centralized Certification system for all Levels. ISNT-NCB or its approved agency certifies all levels based on examination.
Experience Requirements: PT- 3 MT-3 RT-12 UT-12 (Months) Experience may also be calculated in number of hours	Experience Requirements: PT 1+3=4 MT 1+3=4 RT 3+18=21 UT 3+18=21 (Months) More experience required than SNT-TC-1A
Training Requirements: PT 4+8=12 MT 12+8=20 RT 40+40=80 UT 40+40=80 Hrs	Training Requirements: PT 16+24=40 MT 16+24=40 RT 40+40=80 UT 40+40=80 Hrs For PT & MT more training hours required than SNT-TC-1A
Examination Requirements: For Level I & II : General , Specific and Practical. For Level III : Basic, Method, Specific	Examination Requirements: For Level I & II : General ,Practical only No Specific exam required. For Level III : Basic, Method and Practical (Procedure writing)
Certificate Validity: Level I, II & III – 5 Years	Certificate Validity: Level I, II & III – 5 Years
Eye Examination: Minimum Vision requirement : J2	Eye Examination: Minimum Vision requirement : J2

Apart from above differences, Code issuing organization gives specific requirements to the training and certification programs. ASME issued separate exceptions and additions from SNT TC 1A in 2019 BPVC edition. The salient points to be noted are:

- Employer's written practice for personnel qualification and certification shall be in accordance with SNT-TC-1A 2016 edition and Article 1 Mandatory Appendix III- "Exceptions and additional requirements for the use of ASNT SNT TC 1A 2016 Edition"
- If CR, DR, PAUT, TOFD, FMC are to be used, Employer's written practice shall cover training, experience and examination requirements of SNT-TC-1A 2016 and Article I mandatory Appendix II-"Supplemental personnel qualification requirements for NDE Certification.
- Replacing Section V "Shall" statement with "Should" statement is not allowed.
- Minimum passing grade for Level I & II: General and Specific 70%, Practical 80% Composite 80% (As per SNT TC 1A, for practical 70% only)
- Near Vision Acuity requirement: J1 in Standard Jaeger test chart, administered annually Color contrast differentiation administered annually. (As per SNT TC 1A, near vision acuity J2 and color contract differentiation to be administered upon initial certification and at 5 years interval thereafter)
- Vision Examinations expire on the last day of the month of examination is not allowed. To be conducted annually.
- Valid ACCP Level II/III or ASNT Level II/III shall not be used to waive the specific examination.
- The Practical examination (other than TOFD/PAUT/CR/CR) shall require one flawed specimen for each technique and at least two for each method.
- Level I/II Practical Examination: Candidate shall detect at least 80% of the discontinuities and conditions specified by the Level III.
- Recertification by continuing satisfactory technical performance is not allowed. Recertification by re-examination for all NDT Levels.
- Maximum Recertification interval shall be 3 years for Level I & II Personnel and 5 years for Level III Personnel. Certifications shall expire from the date of the first examination taken during initial or recertification activities for each method.

Congratulations



Ms. Ananiaa
D/o Shri. K. Monagurubaran
Scoring 458/500 marks in SSE 2021



Ms. Sudharshini J
D/o Shri. Jayabala Chandran
Scoring 457/500 marks in SSCE 2021