SOUND BYTES - 17

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JULY 2025 issue

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Official Newsletter of ISNT Chennai Chapter

YOU HAVE DONE IT.

Dear Readers,

Congratulations. This is a proud moment for all of us. With this issue we are entering into the 5th year of publication without interruption, even once.

This achievement was made possible due to unstinted support of the authors and unwavering support from sponsors, equipment manufacturers and you the readers. This would not have been possible without your encouragement. By being in constant touch with you all we have been striving to full fill your desires. It is our commitment to serve the NDT industry in all areas of its involvement - limited as it may be.

End is, when you decide. Please do not hand the decision over to others

I wish to dwell a little on the topic of retirement. When we retire two noteworthy things we have gained. They are:

1. Experience and
2. Leadership, however minor it may be.

Do we have to dump it all on the day of retirement? That is my question.
Some take gainful employment and continue and for some it is diverting their potential to some other areas. Few of us wither away into oblivion pondering over the life that we have sailed – mostly the negative incidents and lingering over the question why me?

Your sound byte is to change it all. It has created a space for freedom of expression. Our thinking is on the following lines:

1. This platform is for all those who are willing to learn.
2. **For progress momentum is important**. Finance is not the only resource for progress. That is how standards originated - don't reinvent the wheel. Express your experience, pen it down.
3. **Innovate for humanity**. It may be a small action but it can open doors.
4. **Leadership is not just making money**. It is stimulating possibilities and creating connections.
5. Generally it is thought greatness is born out of building great things. But many times it is rebuilding small things when nobody is watching.
6. Even the quietest hands can leave a legacy behind.
7. You can show the people to face the toughest situation with patience and not panic.
8. Last but not the least. Sound bytes is a platform to give you a voice to express yourself freely without fear or favor.

To sum it, all I can say is that let the brilliance be not extinguished by retirement. Millions of people with potential are caught in a web of limitation. Break the shackles and open yourself without self judgment.

Are we ready to polish rough diamonds?

Regards,

Ram

Indian Society for Non-Destructive Testing , Chennai Chapter
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ISNT Chennai Chapter News

Addition of Members – The total membership strength as on date is 937

Newly Added Members up to June 2025

1. M/s. ARUDRA ENGINEERS PVT LTD – Life Corporate Member
2. Mr.GANDHI C, Arudra, Chennai – Life member
3. Mr.P S VEERAKUMAR, Arudra, Chennai – Life Member
4. Mr.SUGAN D, Chennai – Associate member
5. Mr. Ramajayam Jayavel, Arudra, Chennai – Life Member

MEMBERSHIP STATUS UP TO JUNE 2025

PARTICULARS	March 2025	Newly added	June 2025
LIFE CORPORATE MEMBER	59	1	60
CORPORATE MEMBER	3		3
LIFE FELLOW	14		14
HONORARY FELLOW	9		9
LIFE MEMBER	617	3	620
MEMBER	21		21
ASSOCIATE MEMBER	7	1	8
STUDENT MEMBER	202		202
TOTAL	932	5	937

Course Conducted

Sl.No	Course	From	To	No. of participants	Course Director
1	Surface NDT(PT&MT)-Level II	24.04.2025	03.05.2025	13	Sri M.S.Viswanathan
2	In-house program on Visual Testing-Level II At NPCIL, KKNPP	19.05.2025	24.05.2025	21	Sri V. Sankaranarayanan
3	In-house program on Penetrant Testing-Level II At NPCIL, KKNPP	26.05.2025	31.05.2025	20	Sri V. Sankaranarayanan
4	In-house program on Ultrasonic Testing -Level II At NPCIL, KKNPP	02.06.2025	12.06.2025	21	Sri S.R.Ravindran
5	Radiography Testing-Level II	11.06.2025	21.06.2025	13	Sri S.Chockalingam

EC meeting

The 1st EC Meeting for the financial year 2025-2026 was held on 6th April 2025 at IITM, Chennai and was presided over by Prof.Prabhu Rajagopal.

The 2nd EC Meeting for the financial year 2025-2026 was held on 18th May 2025 at IITM, Chennai and was presided over by Prof.Prabhu Rajagopal.

The 3rd EC Meeting for the financial year 2025-2026 was held on 8th June 2025 at ISNT Chennai Chapter and was presided over by Mr.Parthapratim Brahma.

ISNT DAY CELEBRATION ON 21ST APRIL 2025

ISNT Day was celebrated on 21st April'2025, at Hotel Ramada Plaza, Guindy, Chennai. The Chief Guest was Prof. S. ARUMUGAM, Vice Chancellor, Tamil Nadu Open University, Chennai and addressed the gathering.

Shri. R. SEKHARAN, Secretary, Humour Club International, Chennai regaled the audience through his Humorous Talk Prof.Krishnan Balasubramanian President ISNT and Prof.Prabhu Rajagopal , Chairman Elect welcomed the gathering and spoke about the importance of ISNT Day. The prestigious award for the year were conferred on the Awardees by the Chief Guest. The faculties, equipment providers and contributors to Sound Bytes were honoured.

Release of Sound Bytes-16 and Mementos to Authors

SOUND BYTES AUTHORS TILL 16TH ISSUE		
1. R. Subbaratnam	10. S.G.N. Murthy	19. K. Viswanathan
2. R. Balakrishnan	11. B.N.Shankar	20. C. Karuppasamy
3. Phani Surya Mylavarupu	12. C. Srinivasan	21. Ing Saptarshi Sasmal
4. V.Manoharan	13. S. Thiagarajan	22. S. Ramakrishnan
5. Dr.Prabhu Rajagopal	14. M. Menaka	23. Chirag Darji
6. Prof.Balaji Srinivasan	15. Kasi Viswanathan	24. Anil Nair
7. M.Manimohan	16. S. Chockalingam	25. John David M.
8. E.Sathya Srinivasan	17. Parthapratim Brahma	26. B. Ram Prakash
9. Dr. G.Raghava	18. R.J. Pardikar	

Awards given during ISNT DAY 2025

Chapter Awarded for the following Candidates:

1. **The Best Member Award "Thambidurai Award" sponsored by M/s. Electro-Magfield Controls & Services was awarded to Mr.N.Karunanidhi.**

Mr.N.Karunanidhi, a life member of ISNT (LM3384CH) did his diploma in mechanical Engineering and joined Boiler Inspectorate of Tamil Nadu in the year 1979 as Junior Technical Officer. After joining he continued his educational pursuit diligently and completed B.E (Anna University), MBA and M.Phil from Madras University in 2002 with first class honours.

He retired from Boiler Inspectorate during April 2007 and established a company in the name and style of GKN Associates cutering to process industries and power plants.
He joined ISNDT as an associate member in the year 1982 and after the merger of ISNDT & IINDIE rose to be a life member. An Executive Council Member for more than 2 decades he served ISNT Chennai Chapter as a Co-Treasurer and Treasurer. During his long tenure with ISNT CC he had been a source of strength coordinating with Boiler Inspectorate and conducting seminars on Boiler under the leadership of Late Thambithurai and created a record for the number of attendees for the tutorial during Chennai NDE Conference of 2002. He was an active member of various seminars, conferences and stall management and continues to do so.

Awards given during ISNT DAY 2025

2. The Best Technical Talk Award "Rajamani Award" sponsored by M/s. Electro-Magfield Controls & Services was awarded to Ms.M.Menaka, IGCAR, Kalpakkam

Mrs.M.Menaka, a postgraduate in physics and has over 23 years of experience in the field of NDE for materials characterization. She has specialized in the areas of thermal imaging, image processing and Digital Radiography. She is presently Heading, Radiation and Meteorology Section of Radiation Application and Technology Division in Indira Gandhi Centre for Centre Research, Kalpakkam.

Her field of interests are Material Characterisation using thermal NDE and Thermal imaging as diagnostic tool in healthcare. She is an American Society for NDT certified Level – III in Infrared Thermal Testing. She has more than 70 publications in international and national journals and 80 publications in conferences. She has more than 1085 citations for her credit.

She has won the best paper awards during the IIM NMD-ATM 2005 and NDE 2007. She has also won the best paper award in the R&D Category for the paper published in Journal of NDE. She is a recipient of the Group Achievement Award of Department Atomic Energy- for the year 2009. She has been bestowed with Science and Technology Excellence Award by Department of Atomic Energy for the year 2020.

3. **The Best Participation in courses Award "Pari Award" sponsored by M/s. QTECH was awarded to Dr. R.Arunprakash, Karmen International, Chennai.**

Dr.R.Arunprakash born in 1995 a B.E (Mechanical) and M.Tech (Welding) from Anna University did his doctorate from VIT in Welding Metallurgy in 2024. Presently he is the Team Lead in Research & Development of M/s.Karmen International Private Limited involved in process optimization, metallurgical analysis and advanced NDT techniques to ensure product quality and reliability. He bridges the gap between academic research and industrial applications to ensure that quality is embedded in the manufacturing process from design in dispatch stages.

4. **The Best Student Achievement Award "Kiran Award" sponsored by Prof.D.R.Kiran was awarded to Mr.Akshay Govind Srinivasan, IIT, Chennai for the year 2024**

Mr.Akshay Govind Srinivasan, BTech Mechanical Engineering , IITM, Chennai is having CGPA of 9.76 out of maximum of 10.

ACHIEVEMENTS-SCHOLASTIC –

- secured First Rank in the Department of Mechanical Engineering; Obtained a perfect 10 GPA in Semester 3/5.
- Secured a rank of 1424 in JEE mains and 1849 in JEE Adcanced: Perfect scores in 3 subjects in Class 12 CBSE.

PUBLICATIONS AND PATENTS:

- Data Generation techniques for Tool-based LLM applications (under Provisional Patent: IP 202441079904)

RESEARCG EXPERIENCE: (Under Prof.Prabhu Rajagopal)

- Leveraged Data-Driven Models for Multi-frequency ultrasonic defect characterization: achieved best R^2 of 0.75.
- Developed an Auto encoder for denoising ultrasonic A-Scans, improving signal quality for defect characterization.
- Created a dataset of over 140A/B-Scans envelopes for varying defect characteristics from FEA simulations

RELEVANT COURSES / SKILLS

- ISRO Bharatiya Antarikksh Hackathon: Selected among Top 30 across India in building Geo-spatial Agents
- National Level Recognition: Project stacked Agriculture was chosen among the top 20 at the national level.

STANDARD- ESSENCE OF EXPERIENCE
DISTINGUISH THE STANDARDS
STANDARDS FOR MAGNETIC PARTICLE TESTING

By Mr.M.Manimohan, Manager (Retired), NDTL, BHEL, Trichy

STANDARDS FOR MAGNETIC TESTING
INDIAN STANDARDS

1) IS 3703.2004 Recommended Practice for MT for Flaw Detection
2) IS 5334-2003 MT Flaw detection of Welds-Code of Practice
3) IS 6410 MT Ink and Powders-Specifications
4) IS 6752 Code of practice for magnetic particle flaw detection of ferrous pipes and tubes (2nd revision 2014)
5) IS 7743-MT for Steel Forgings
6) IS 10543 Method for Dry Powder MT
7) IS 10724-Acceptnce of MT for Castings-2000
8) IS 12147 -Recommended practice for wet magnetic particle examination (1st Revision 2013)
9) IS 15539 -Recommended practice for MPI of steam turbine rotor blades

ASTM - Weld, cast, forge:

a) E125 Standard reference photographs for magnetic particle indications on ferrous castings.
b) A275 Magnetic particle examination of steel forging.
c) A456 Magnetic particle inspection of large crankshaft forgings.
d) E709 Standard recommended practice for magnetic particle examination-raw material,
e) semifinished material (billets, blooms, castings, andforgings), finished material and welds.
f) E1444/E1444M-22a Standard Practice for Magnetic Particle Testing -rawmaterial,billets,finished and semi-finishedmaterials,welds,andin-serviceparts
g) E3024/E3024M-22a Standard Practice for Magnetic Particle Testing for General Industry
h) Lighting
i) E2297-23 Standard Guide for Use of UV-A and Visible Light Sources and Meters used in the Liquid Penetrant and Magnetic Particle Methods
j) E3022-18 Standard Practice for Measurement of Emission Characteristics and Requirements for LED UV-A Lamps Used in Fluorescent Penetrant and Magnetic Particle Testing

ASME (BPVC) Code - Section V Article 7- ISO

1) ISO 3059-PT, MT Viewing Conditions
2) ISO 4986-2020 Steel and Iron Castings-MT
3) ISO 9934-1-2016-MT Part 1 General Principles-Ferrous components
4) ISO 9934-1-2015-MT Part 2 Detection Media
5) ISO 9934-1-2015-MT Part 3 Equipment
6) ISO 10893-5-2011 MT of Steel Tubes Seamlessand Welded-Surface Defects
7) ISO 12707 - 2016-MT-Vocabulary

BS EN

1) BS EN 10228-1 2016 MT of SS Forgings

BS EN ISO

1) BS EN ISO 17638 (2009) - Weld MT
2) BSEN ISO 23278- MT Acceptance levels for welds

AUSTRALIAN STANDARD

1) AS 1171-Magnetic Particle Testing

EN STANDARDS

EN 1369:1996 – Founding - Magnetic particle inspection
EN 10228-1:1998, Non-destructive testing of steel forgings — Part 1: Magnetic particle testing
EN 1290:1998, Non-destructive examination of welds — Magnetic particle examination of welds

Society of Automotive Engineers (SAE)

a) AMS 2300F Premium aircraft quality steel (cleanliness, magnetic particle inspection procedure.
b) AMS 2301G Aircraft quality steel cleanliness, magnetic particle inspection procedure.
c) AMS 2640J Magnetic particle inspection.
d) AMS 3040 Magnetic particle inspection, material dry method.
e) AMS 3041A Magnetic particles, wet method, oil vehicle.
f) AMS 3042 A Magnetic particle, wet method, dry powder.
g) AMS3043 A Magnetic particle, wet method, oil vehicle, aerosol canned.
h) AMS 3044 B Magnetic particles, fluorescent wet method, dry powder.
i) AMS 3045 B Magnetic particles, fluorescent wet method, oil vehicle ready to use.
j) AMS 3046 B Magnetic particles, fluorescent wet method, oil vehicle, aerosol packaged.
k) AMS 3061 Inspection vehicle.

ESSENTIAL EXPECTATIONS

Importance of NDT in power Industry and expectations from NDT service providers:

By Dr.R.J.Pardikar, G M / NDT/ QUALITY (Rtd) ; BHEL Trichy, Past President—ISNT.

Introduction:

The increasing global demand for energy, driven by industrial development, has resulted in expansion of power generation Sector. The power generation industry relies on the uninterrupted operation of critical systems such as turbines, boilers, and heat exchangers to ensure consistent and efficient energy production. These critical components are subject to immense operational stresses, including high temperatures, pressure variations, and mechanical forces, which can lead to material degradation, fatigue, Creep and failure over time, necessitating periodical effective inspection and maintenance practices making NDT crucial for ensuring operational efficiency, reliability and safety.

Role of NDT:

Non-Destructive Testing (NDT) plays a key role during manufacturing of these equipment and in the maintenance and in-service inspection of these components, ensuring their safety, efficiency, and reliability without causing any damage. NDT in the power generation industry is mainly used to assess the integrity of these critical components.

In power plants, boilers and turbines are two of the most critical systems. Boilers provide the steam needed to drive turbines and other machinery while Turbines are responsible for converting thermal energy into mechanical energy, over a period both turbines and boilers are exposed to extreme operating conditions that can lead to fatigue, creep, corrosion, erosion and other forms of damage. Early detection of these damages is essential to prevent catastrophic failures, extend the operational life of these components, and minimize downtime for repairs.

NDT offers a non-invasive way to inspect these components, providing accurate and reliable results without interrupting their operation.

NDT is critical in ensuring plant reliability, safety and conformance to legislative requirements. It also helps to improve Power plant's operational availability.

It is critical for maintenance engineers to work with qualified NDT inspection professionals who understand the power industry and can comprehend such complex systems. With proper training in the latest inspection tools and technologies, NDT professionals can better detect and size the discontinuities and defects with effective data collection and little interruption to daily processes and procedures.

Considering the volume of work and the timelines for the Power projects it becomes unavoidable to engage the external NDT services.

Major NDT Applications in Power Generation:

Welded Joint Inspection: Ensuring the integrity of welds in pressure vessels, pipelines, and other critical components.
Corrosion Detection: Identifying corrosion in pipes, tanks, and other infrastructure.

Component Integrity Assessment: Evaluating the condition of Boilers, turbines, and other critical components.

Leak Detection: Identifying leaks in pipelines, tanks, and other systems.

Deploying NDT Service providers: deploying NDT service providers in the power generation industry requires rigorous evaluation criteria, including quality management systems, qualified personnel, documented procedures, and adherence to relevant standards.

Expectations and requirements from NDT service providers:

The objective of these requirements is to ensure that the NDT Service provider is using appropriate procedures for performance, application, control, verification and reporting of NDT and has qualified and certified personnel. In addition, the NDT Service provider shall have quality management system and furnish appropriate equipment and facilities commensurate with the requirements of power industry.

1) Quality management system:

The NDT Service provider shall have a documented quality management system, covering work procedures for all tasks and operations, including the various NDT methods and NDT techniques for which the NDT Service provider is engaged by the power equipment manufacturer or the power utilities. An outline of NDT Service providers organization and management structure shall be made available.

2) Reliable Inspection:

NDT services shall include reliable and accurate inspections, adherence to safety standards, skilled technicians, timely delivery of services, and cost-effectiveness to ensure the integrity and safety of critical Power equipment.

3) Tailor services to the specific needs:

NDT Service providers shall be able to tailor their services to the specific needs of power industries, and infrastructure. NDT Service providers shall be equipped with adequate resources, the latest NDT technologies and techniques to ensure accurate and efficient inspections.

Most of the Thermal Power equipment are fabricated by welding of steel pipes, tubes and pressure vessels and require extensive NDT inspection during manufacturing and in service inspections. These techniques include both volumetric and surface NDT methods such as RT, UT, MT, PT, ET, VT etc.

4) Accurate Defect Detection:

Power equipment manufacturers & power utilities expect NDT service providers to accurately identify, locate and characterize any defects or irregularities in materials, weldments and structures in accordance with the national and international codes, standards and customer specifications. NDT services shall provide reliable and consistent test results.

5) Skilled Technicians:

The NDT technicians deployed by the service provider shall be well-trained, experienced, and certified to National and international standards (ISO 9712, ASNT SNT-TC-1A, BS 13805)by the recognised certifying bodies such as PCN, CSWIP, ICN, ASNT etc to ensure the quality and reliability of the inspections.

The operator carrying out the NDT and interpreting indications, is to as a minimum, be qualified and certified to Level 2 in the NDT method(s) concerned. However, operators only undertaking the acquisition of data using any NDT method and not performing data interpretation or data analysis may be qualified and certified as appropriate, at level 1.

The operator shall have adequate knowledge of materials, welds, structures or components, NDT equipment and limitations that are sufficient to apply the relevant NDT method for each application appropriately.

Experience gained through on-the-job training and product knowledge and knowledge of damage mechanisms in power industry is crucial.

6) Appropriate Equipment:

The NDT service provider shall possess and maintain appropriate equipment and facilities commensurate with the power industry requirements.

The NDT Service provider shall maintain records of the NDT equipment used and detail information related to maintenance, calibration and verification activities.

Where the NDT equipment is of unique nature, the NDT operators are to be trained by competent personnel in the operation and use of the equipment before carrying out NDT using this equipment.

7) Safety and Regulatory Compliance:

NDT services shall be performed safely, minimizing any risks to personnel or equipment. Service providers shall adhere to power sector industry standards, industry safety regulations, such as IBR, AERB, ASME etc and best safety practices shall be followed while performing NDT. ensuring that power generation facilities operate in compliance with safety and environmental guidelines.

8) Timeliness and Efficiency:

Most of the power projects are time bound and expect NDT services to be delivered in a timely manner, minimizing downtime and disruptions. NDT service provider shall have adequate manpower, equipment and resources to meet the peek loads and short cycle times during shut down.

9) Cost-Effectiveness:

NDT services shall be competitively priced, providing value for money. NDT providers shall offer cost-effective solutions that meet the specific needs of the power sector.

10) Data acquisitions and Analysis:

NDT data acquisition is crucial for verifying the integrity and safety of the power equipment, allowing for informed decisions on maintenance, repair, and replacement.

NDT service providers shall acquire the NDT data accurately by deploying approved procedures, trained and experienced inspectors and analyse the test results effectively, providing valuable integrity of the critical weldments and material.

11) Clear Communication and Reporting:

NDT providers shall communicate clearly and effectively with manufacturer of equipment and power utilities, providing reliable reports and recommendations. All NDT is to be properly documented in such a way that the performed testing and examination can be easily retraced and/or repeated at a later stage.

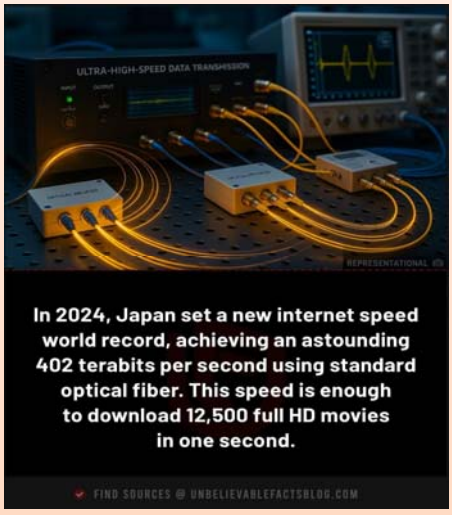
The reports shall identify the defects present in the tested area and provide a conclusive statement as to whether the material, weld, component or structure satisfies the acceptance criteria or not.

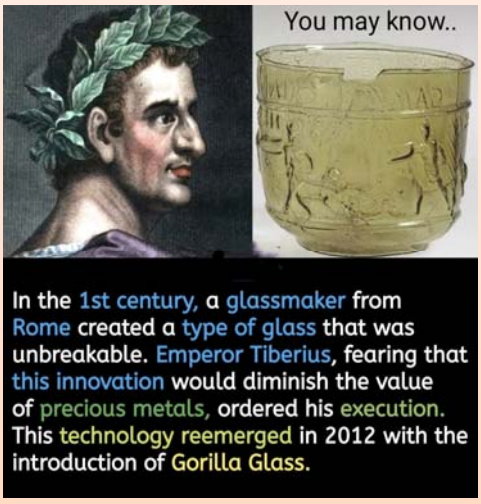
12) Specialized services:

NDT service providers shall be capable of providing specialized NDT techniques whenever required by the power utilities to resolve operational problems or to support failure analysis.

Conclusion: Establishing clear criteria for deploying Non-Destructive Testing (NDT) service providers is crucial for ensuring safety, reliability, and cost-effectiveness in power generation industries, as it helps to select qualified personnel and appropriate NDT methods to detect and maintain asset integrity. It is necessary to periodically monitor and evaluate the service provider's quality assurance procedures and their ability to maintain consistent and reliable results. NDT service providers shall plan activities by managing resources effectively, and prioritizing quality and safety. This involves optimizing workflows, using technology, and continuously improving processes.

TITBITS





LL.B. Class:

Professor: "If you have to give an orange to me, what will you say?"

Student: "Take this orange."

Prof: : "No. Say it like a lawyer would."

Student: "I, Ramakrishna, son of Satyamurthy resident of Bangalore, Karnataka do hereby solemnly affirm & voluntarily & consciously declare out of my volition & without any fear or favour or pressure or undue influence, that I'm giving this fruit called 'orange' on which I have absolute right, title and interest, along with its peel, juice, seed and pulp.

I am also giving you absolute and unqualified right and interest to cut, peel, store in freeze or eat it.
You will also have the right to give this along with its peel, juice, seed or pulp to any one whosoever.
I further declare that I will be solely responsible and liable for any dispute till today pertaining to this orange. And after this conveyance today, my relationship with this orange will cease to exist."

Prof: "My Lordship, show your feet....!!"

The Innovation Sutras - Theory needs to be grounded in practice (Sutra 3)

(Professor Prabhu Rajagopal, Faculty in-charge, Centre for Innovation (CFI), IIT Madras; recipient of prestigious early career awards including the IEI-National Design Award, and the National Swarna Jayanti Fellowship)

In the context of practical product or solution development, the true ground of innovation is developed through deep conceptual understanding by extensive theoretical or analytical studies, reinforced by the clarity derived from practical experimentation.

By testing the knowledge or skills learned through practical application, a thorough understanding is developed, leading to a flowering of the innovative spirit.

This type of advanced learning can manifest and take different forms at different stages of product creation.

During the ideation stage through to proof of concept -- activities typically carried out at academic or industrial research groups -- theoretical understanding is obtained from the knowledge presented in textbooks or foundational journal articles, where this is also often encoded in the form of analytical expressions.

This is today refined through extensive numerical simulation studies using fine element analysis, computational fluid dynamics, or 3D computer-aided design models.

In such settings, practical grounding comes from laboratory experiments that help to validate the simulations and set limits to the hypothetical constructs theorised.

A clear conception of the underlying physics gained from such deep study, can help overcome practical challenges innovatively.

AN EXAMPLE FROM IIT MADRAS

For example, super-resolution imaging using ultrasonic's is a core area of research at the author's Laboratory, the Center for Nondestructive Evaluation at IIT Madras, and holey metamaterial lenses are studied to achieve this.

In holey 'metalenses', the higher imaging resolution is achieved by amplifying and recovering through resonances, high-frequency transient wave fields containing fine feature information. In the initial years, fabrication of such media with an array of sub-millimeter holes was challenging.

However, since the physics of the problem shows that the performance of the metalens is only based on repeated resonant features and not the underlying material property, we were able to demonstrate very high resolution using everyday objects – a collection of plastic drinking straws, and an array of slits!

At higher technological readiness levels in the product development cycle, practical understanding typically comes from interfacing with the 'real world' to increasing extents.

Maker spaces in academic or industrial settings are important arenas for gamified learning that help bridge the gap between 'learning' and 'doing'.

Sarthak Sourav, the current Student Head at Centre for Innovation (CFI), IIT Madras, says, "At the 3D Printing Club of CFI, we were developing a pellet-based 3D printer, but the required extruder was prohibitively expensive and only available as an import item."

"After gaining a thorough understanding of the extruder, our team took a hands-on approach by creating various designs and conducting simulations to determine the most effective solution. We then built small prototypes and ran rigorous surrogate tests to ensure functionality," he says.

"After several iterations, we successfully manufactured a full-scale extruder at a significantly lower cost than the imported option. This not only enabled us to continue with our pellet printer project but also led us to file for a patent on our innovative and cost-effective extruder design," he explains.

HOW STARTUPS HELP WITH PRACTICAL LEARNING

Startups today provide a valuable link in closing the gap in learning, also offering avenues for experiencing practical conditions that mesh with theoretical learning.

At some of the best research groups in the world both in academic and industrial settings, startups or immersive teams focused on technology commercialisation offer real-world insights to scientists and technologists.

Ashish Antony Jacob, Lead (Products and Research) at the IIT-Madras incubated submersible robotics startup Planys Technologies, says: "Ultrasonic pulse velocimetry (UPV) is widely used to assess the integrity of civil structures."

"Typically, UPV involves placing transducers on diametrically opposite sides of a concrete structure to measure bulk ultrasonic wave velocities. However, for large underwater or submerged marine assets such as concrete piles, access is typically available only on one side," he explains.

"A strong background in wave physics helped us realise that the velocity of surface ultrasonic (or Rayleigh) waves is related to that of bulk waves, ultimately correlating to material strength," he says.

"Today, Planys's remotely operated vehicle (ROV) based robotic Rayleigh-UPV system is routinely used to generate 2D velocity maps, which allows for rapid evaluation of gross structural integrity of marine and submerged assets," he adds.

Acknowledgement: The above article authored by Prof.Prabhu Rajagopal was published in India Today (27th June 2023) is republished in this Sound bytes, as we found it informative and an excellent guide for people in any walk of life. Our sincere thanks to India Today for publishing it.

TOOLBOX TALK AND ITS IMPORTANCE

By Shri Umakanthan Anand,
Head – Reliability Static Equipment and Piping Reliance Industries Limited

A Toolbox Talk (or Toolbox Talk) gets its name from the idea that it's a brief safety meeting or discussion held on the job site, often at the beginning of a work shift, typically where workers gather — like around a toolbox. It's meant to be informal and practical, much like the tools used on the job. It originally took place around a physical toolbox on construction or industrial sites. It's meant to be part of the daily routine, just like using tools. The history of toolbox talks in safety is rooted in the broader evolution of occupational health and safety practices, gaining significant traction in the 20th century due to increased awareness of workplace hazards alongside industrialization and technological advancements.

IMPORTANCE OF TOOLBOX TALK: The importance of a Toolbox Talk lies in its ability to keep safety top-of-mind for workers and reduce workplace incidents. Here's why it matters:

1. Reinforces Safety Awareness

Toolbox Talks are daily or weekly reminders of potential hazards. Repetition helps engrain safe behaviour and keep everyone alert.

2. Prevents Accidents and Injuries

By discussing job-specific risks before work starts, Toolbox Talks help workers anticipate and avoid accidents, which can save lives and reduce downtime.

3. Encourages Communication

These talks open the door for two-way communication. Workers can voice concerns, report near misses, or suggest safer practices.

4. Provides Continuous Training

Toolbox Talks serve as bite-sized, on-the-job training that complements formal safety programs — ideal for reinforcing safety without pulling workers off the job.

5. Ensures Legal Compliance

Many safety regulations (like OSHA or HSE) recommend or require regular safety meetings. Toolbox Talks help meet these requirements and document compliance.

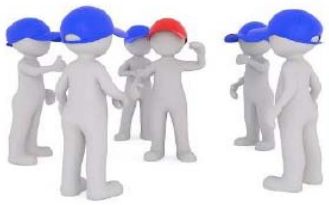
6. Boosts Team Morale and Responsibility

When workers know that management cares about their safety and involves them in discussions, it fosters a culture of responsibility and teamwork.

TOOLBOX TALK FORMAT

All toolbox talk shall be short and effective with minimum following points discussion.

- Introduction and context
- Hazards involved in job/task.
- Incidents if any with same job/task in past.
- Expectations from worker/executor.
- Requirement of specific PPE, Procedure, competency to execute the job/task safely.
- Question and answer
- Documentation.



Use visuals or demonstrations whenever possible. Remember to keep it concise and focused. Use clear and simple language.

Today, toolbox talks, also known as safety briefings or tailgate talks, are a widely recognized and essential part of occupational health and safety programs across various industries. They serve as a platform for discussing potential hazards, safe work practices, and other safety-related issues before work commences. These brief (5-15 minute) and regular discussions reinforce safety awareness, encourage worker participation, and contribute to a positive safety culture.

ECHO BITES

Dear Ram Prakash,

I am sure many like me, who wait eagerly for the new issue of Sound Bytes, were delighted to receive the April 2025 Issue, Sound Bytes-16. It has all the ingredients to excite industry professionals and technical community. I have the habit of glancing through the new edition quickly as soon as received and leave it for detailed reading later, article wise, based on the topics prioritised by me. I found this edition offering plethora of opportunity for knowledge acquisition, besides its usual Chapter updates and training activities.

Most interesting read for me was the opening remarks from Mr. Ram Prakash introducing this edition. It was very interesting to know the background story of ISNT Day celebration and the true leadership of Mr. R Balakrishnan to bind this special community of NDT professionals not to feel alone. Thanks Mr. Ram Prakash for kindling the passion among many of us, particularly the new generation through this guided tour to the past.

Introduction of a new section to address sector specific NDT requirements is very timely and welcome step to help the stakeholders, be it service provider, shop QC engineers or even user/buyers. The article on NDT in Oil & Gas sector by Mr. Chirag Darji was very useful reading.

Articles from Mr.M Manimohan are always very interesting with a lot of practical application-based input. As usual this time the compilation of various national/international dye penetrant standards is very handy ready reckoner.

The Railway sector is very special, given the length and breadth of it in our country for transportation of goods and people. Non-destructive testing and its advancements in this sector needed focus as it has some of the stringent safety criteria. The write up by Mr. Anil Nair on using automatic UT for railway wheel testing is very well articulated and I am sure our NDT practitioners will find it useful.
The article by Prof. Prabhu Rajagopal Innovations Sutras (part2), as reproduced in this edition of Sound Bytes is thought provoking and sure will do a lot good for our new generation entrepreneurs.

I found the short article by Mr.R Balakrishnan on electromagnetic spectrums as educative as it always helps us remember and stick to the basics.

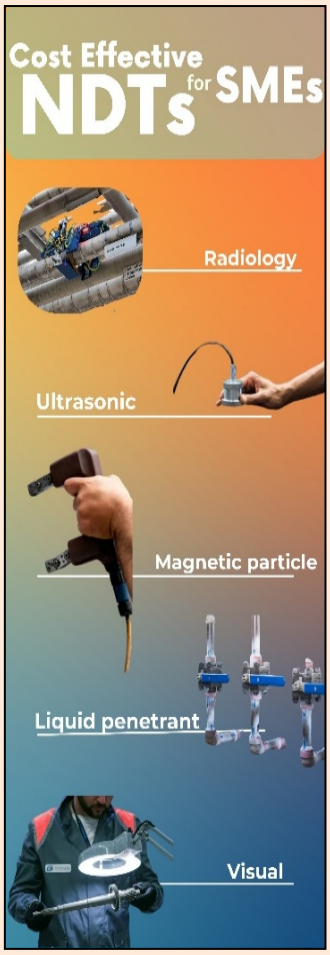
It is heartening to read through the article by John David M and find that from a student's perspective NDT holds a very strong position as career option. I am sure such article will influence many young minds.

It was very satisfying to go through such technical journal with content of high quality. I am aware how much painstaking efforts go behind every edition and I salute the commitment and passion of Mr. Ram Prakash. Our community is fortunate to have such professional holding hand with the guiding light.

I would also thank ISNT Chennai Chapter and its leadership team to support every endeavour to reach out to stakeholders in promoting the cause of NDT education.

Parthapratim Brahma
Mentor, TWI India—Ex Lloyd's Register

SCHOLARS' CORNER



Non-Destructive Testing for SMEs – Scholar's perspective

NDT is a variety of methods & techniques used to collect information about a material's structure and evaluating them, without damaging them. It is based on fundamental physical principles and is categorized as **Applied Physics**. It is basically characterization on material involving both simple and complex instrumentation, to probe a material to find out the material's real nature. The cost of equipment varies depending upon the requirement. In such condition, the small and medium enterprises (SMEs) find it difficult to involve this practice to ensure quality and reliability in their processing cycle. At times it comes prohibitive due to its cost and expertise needed. This obstacle is overcome of late due to recent Advancements in Artificial Intelligence (AI) and portable NDT equipment.

With the use of the above advanced methods and techniques SMEs can now implement effective quality assurance strategies without the need for costly resources, improving the area of precision and reliability. Furthermore, the inclusion on NDT can be channelized for cost efficiency. For example, SMEs can now invest in training the existing staff to proceed with the basic NDT procedures, reducing the need for NDT consultant. Optimizing NDT methods on the basis of material properties and defect types testing costs can be minimized. On a basic level, many NDT techniques can be employed by SMEs, including penetrant testing, magnetic particle testing and ultrasonic testing. These are crucial for detecting surface and subsurface defects without compromising the material's integrity, thereby ensuring structural stability. By identifying the mistakes in the initial stage of production, SMEs can prevent costly failures and maintain a competitive edge.

JOHN DAVID M
Vel Tech Dr.Baldev Raj NDT Lab

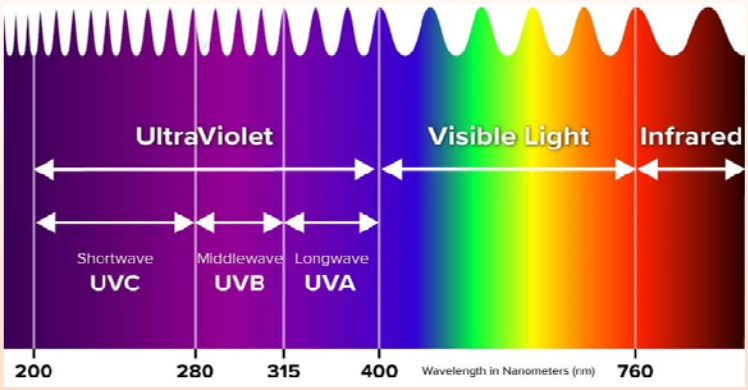
At Dr.Baldev Raj - NDT Lab of Veltech University, NDT Day function was organized on 9th April 2025. On that occasion Dr.Joseph J Kakkassery delivered a lecture on the topic of Current Trends & Carrier Aspects.

Department of Aeronautical Engineering, Rajalakshmi Engineering College in association with ISNT Chennai Chapter organized second National Conference on Progresses and Challenges in Aerospace Engineering (NCPCAE-2025) on 4th & 5th April 2025

ULTRAVIOLET RADIATION

R Balakrishnan, Manager-CQ-BHEL (Retd)

In the last issue the applications of infrared and visible light were specified. Let us proceed with Ultra Violet radiation in Electro- magnetic wave spectrum in this issue



Ultraviolet (UV) radiation is a form of electromagnetic radiation with wavelengths shorter than visible light, but longer than X-rays. It's invisible to the human eye and is divided into UVA, UVB, and UVC based on their wavelengths and energy levels.

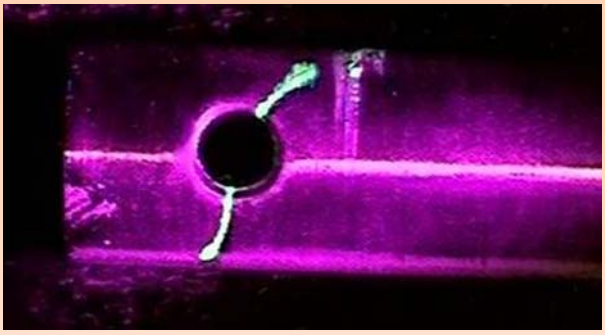
Key points about UV radiation:

- **Wavelengths:** UV radiation has wavelengths ranging from 100 to 400 nanometres (nm).
- **Types:** UVA (315-400 nm), UVB (280-315 nm), and UVC (100-280 nm).
- **Energy:** UVC has the highest energy and shortest wavelengths, while UVA has the lowest energy and longest wavelengths.
- **Sunlight:** The sun is a primary source of UV radiation, with UVA and UVB reaching the Earth's surface, and UVC being absorbed by the atmosphere.
- **Effects:** UV radiation can be both beneficial (e.g., vitamin D production) and harmful (e.g., sunburn, skin cancer).

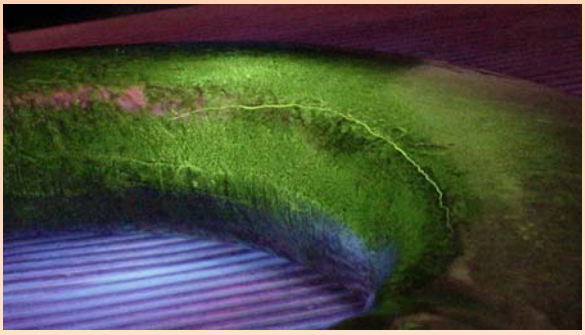
In simpler terms: Imagine the rainbow of colours visible to the eye, but beyond the violet end of the spectrum is UV radiation, which is invisible and can be harmful in excess.

Ultra Violet - NDT application

Ultraviolet (UV) light is commonly used in NDT (Non-Destructive Testing) applications to detect discontinuities in materials that would otherwise be invisible to the naked eye. This is achieved by using UV light to excite fluorescent dyes or magnetic particles, which then emit visible light, highlighting any cracks or other surface imperfections.



FLUORESCENT LPI TESTING



FLUORESCENT MPI TESTING

During NDT inspections, UV lamps are used in conjunction with fluorescent dyes or magnetic particles. These materials are applied to the surface of the object being inspected. When exposed to UV light, the fluorescent dyes or particles emit visible light, highlighting any cracks, seams, or other surface defects.
The emitted rays are in the region of green –yellow wavelength spectrum.
The sensitivity of NDT Inspection using Fluorescent dye or magnetic particles is high compared other surface NDT methods and minute discontinuities can be evaluated using the above method.

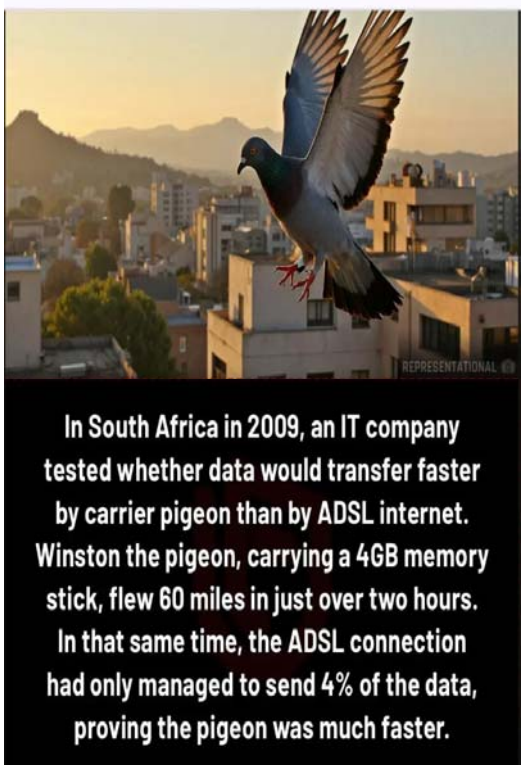
UV radiation –Medical applications

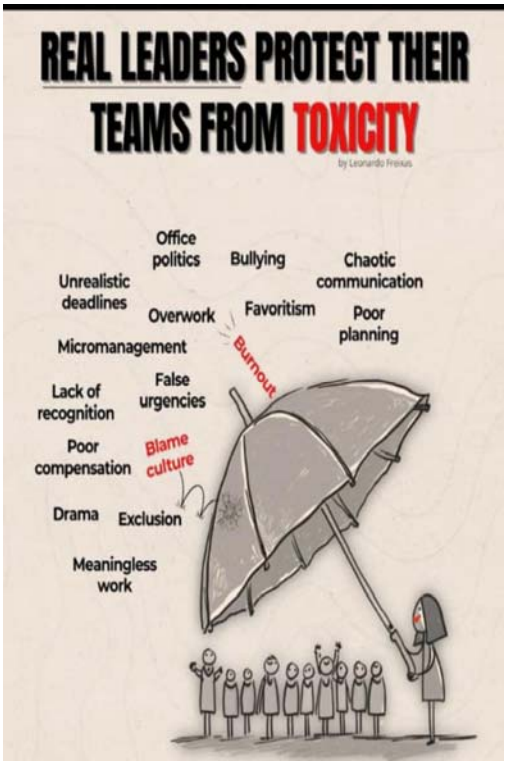
UV radiation is widely used in medical processes for a variety of purposes, such as killing bacteria, creating fluorescent effects, curing inks and resins, phototherapy and subtanning.
Ultraviolet (UV) radiation from the sun and tanning beds is a major cause of skin cancer. UV radiation damages DNA in skin cells, potentially leading to uncontrolled cell growth and cancer development.
Excessive or unprotected UV exposure can lead to severe risks like sunburn and premature aging. UV light, especially UVB, can help reduce inflammation associated with conditions like psoriasis and eczema.
UV rays are essential for the creation of certain substances in plants and in bacteria. UV lamps are used for disinfection process that kills or renders microorganisms, germs, and viruses powerless at home.

ECHO BITES

Dear Ramprakash,
I am in receipt of the Sound- Bytes-16 Issue April, 2025.
From the beginning of the Sound -Bytes, I am regularly receiving and going through the E version and always enjoying going through it.
I remember in one of the Chapter Chairman meetings, I requested Chairman, Chennai chapter to see how a regular E bulletin can be reestablished and promptly the chapter has started it from 30th May 2021 and continued it efficiently and effectively.
In my opinion, the E bulletin is the mirror for the chapter. It gives us the snapshot of the last three months activities and gives confidence.
Your idea of adding Service provider's expectations and future of NDT regularly is indicating that the chapter is going with the changing time needs.
Chennai Chapter being one of the leading chapters in ISNT, has also the responsibility of setting the trends for others and guiding other chapters for taking up new activities. Regular EC Meetings and regular training and Certification is demonstrating your commitment to the Society's objectives.
Mr. Manimohan's list of PT standards is useful for the NDT practitioners.
The expectations from NDT Service Providers is very comprehensive and worth reading by every service provider.
Innovation Sutra 2, by Dr. Prabhu Rajagopal was thought provoking and motivating.
The article on Railway wheel full body inspection by Mr. Anil Nair was interesting.
With Scholar's Corner you are ensuring that young students are joining ISNT which is the need of time.
Mr. R. Balakrishnan's Back to Basics (Relevance of Electromagnetic Spectrum in NDE) , I enjoyed reading.
The feedbacks for the earlier version are compiled nicely and it is the demonstrationof your success.
I am aware that this is Team work and I congratulate team for this beautiful work. At the same time I must congratulate and appreciate the Passionate and Continuous hard work by Ramprakash as I am totally aware of the hard work and pains required to be taken to sustain such activity for years together.
I would expect NDE 4.0, AI in NDE, changes in ASME codes, and latest case studies to keep on appearing in your Bulletin.
With best wishes to Chennai Chapter Team!!
Diwakar Joshi
Immediate Past President—ISNT

TITBITS





TITBITS

During a mathematics course at Columbia University, a student fell asleep and woke up to the sound of his classmates talking. As the lesson ended, he noticed the lecturer had written two problems on the whiteboard. He assumed these were homework assignments, so he copied them into his notepad to tackle later.

When he first attempted the problems, he found them quite difficult. However, he persevered, spending hours in the library gathering references and studying until he was able to solve one of the problems, though it was challenging.

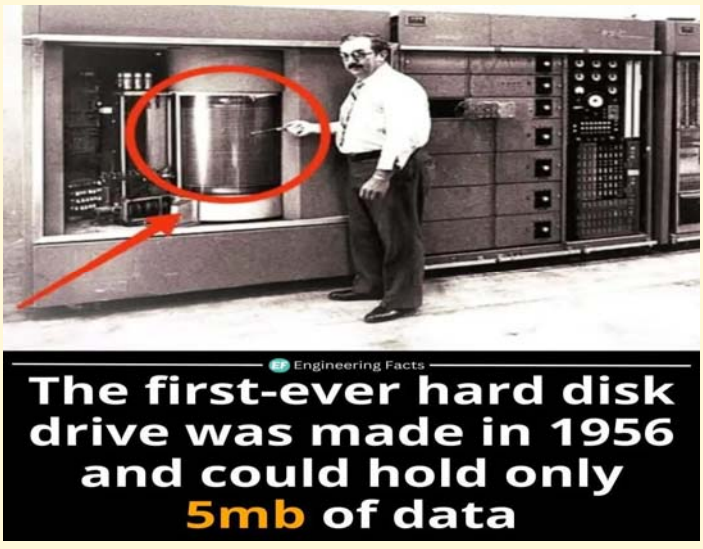
To his surprise, the lecturer didn't ask about the homework in the next class. Curious, the student stood up and asked, "Doctor, why didn't you ask about the assignment from the previous lecture?"

The lecturer replied, "Required? It wasn't mandatory. I was simply presenting examples of mathematical problems that science and scientists had not yet solved."

Shocked, the student responded, "But I solved one of them in four papers!" The solution he discovered was eventually credited to him and documented at Columbia University. The four papers he wrote on the issue are still on display at the institution.

The key reason the student was able to solve the problem was that he didn't hear the lecturer say, "No one has found a solution." Instead, he believed it was a problem worth solving and approached it without frustration, ultimately succeeding.

This story serves as a reminder: don't listen to those who tell you that you can't achieve something, as many young people today are surrounded by negativity and doubt. Some people intentionally plant seeds of failure and frustration.



ECHO BITES

Dear Ram Prakash,

I was so happy to go through the recently published Sound Bites 16th issue.
The team under your stewardship has done an incredible job of taking on the responsibility of publishing this News letter.
The team has worked so passionately to make sure that our members get most useful technical information on NDT. The selection of the topics is so appropriate to the NDT practitioners. The technical articles are absolutely invaluable. There is a good coverage for news items from Chennai chapter activities. The amount of technical information the journal promotes and the resources it shares with everyone is nothing short of inspirational.
Thanks for providing such an excellent forum for sharing knowledge on NDT.
KEEP UP THE GOOD WORK.
Dr. R J PARDIKAR
Past President—ISNT

Dear Sir,

I have gone through the 16th edition of the Sound Bytes.
Which started as a newsletter of ISNT Chennai Chapter is now a sort transformed to a source of technical contents of practical relevance. The coverage of different but appropriate and relevant aspects in the newsletter is noteworthy. The listing of applicable standards for NDT is very useful and handy for the users. The writeup by student and moreover the involvement of students as a contributor is a welcome step. Overall the newsletter came up well. Please accept my congratulations for the fabulous job done by the editorial team to bring out a lively newsletter. My compliments also due to each authors.
Being a Newsletter of chapter, you may consider publishing the organisational achievements of LCMs and personal achievements of individual LM/LF/HFs associated with chapters. You may consider adding industry news and trends. You may also consider a small column introducing new members to your chapters whenever added. Industry best practices for safety can also be regularly published.

Wishing you all the best for the future editions.
Bikash Ghose—Vice President ISNT

Dear Sir,

This issue revealed the aims of Sound Bytes. The contents are found to have adhered to the same.

- ISNT Chennai Chapter's activities and a few photographs inform readers about
- the program details and office bearers' efforts to achieve the same.
- Mr.Manimohan's information is a ready reckoner to find the respective standard details while referring. It saves time.
- Mr.Chirag Darji's Essential Expectations is required for the Oil &Gas sector and NDE personnel working in all other sectors.
- Implant the joy of innovation at the beginning stage yields excellent results at the end. It is needed for motivational design & Gameful thinking environment, in line with Prof Dr.Prabu Rajgopal's "The Innovation Sutras".
- 'Automatic ultrasonic test' enhancing the efficiency & accuracy of railway wheel inspection as mentioned by Mr.Anil Nair, M.D, M/s NDT Technologies, ensures to pave the confidence to implement in other sectors like automobile, and manufacturing units to gain time and quality of their products.
- In Scholars Corner, Mr.John David's significance of Physics Graduates in NDT is an eye opener or good guidance for Physics graduates can take part in to NDT/NDE fields.
- "Mr, Balakrishnan's Relevance of Electric magnetic spectrum in NDT" gives the information about the infrared and visible light which are require for the inspection personnel.

Tit Bits gives Good information.

All the contents in this issue are an excellent compilation by the members of the editorial board, along with the Chief Compiler Mr. B.Ram Prakash. Thanks to all of them, with the respective Authors.
Regards,
R.Jayagovindan, Life Member

ISNT
INDIAN SOCIETY FOR NON DESTRUCTIVE TESTING

Chief Compiler:
Mr.B. Ram Prakash

Members of the Board
Mr. Parthaprathim Brahma
Mr. M. Manimohan
Mr. C. Karuppasamy
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Dr. Joseph J Kakkasery