



*The World Organisation for NDT*

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**CHAIRMAN'S MESSAGE**

**New year, new resolution – implementation of revised ICNDT constitution and operating procedures 2018**

Last year was a great year for ICNDT, with several ICNDT Executive Committee (IEC) meetings, a Policy and General Purpose Committee (PGPC) meeting, along with the 15th Asia Pacific Conference for Non-Destructive Testing (APCNDT). Two Working Group 1 meetings for qualification and certification were held in Vienna and Singapore, respectively. The ICNDT Executive Committee and Working Groups have followed the strategic plan to achieve their intended objectives.



The 15th APCNDT, hosted by the Non-Destructive Testing Society (Singapore) (NDTSS), was a remarkable success. The conference was graced by the presence of Dr Norikazu Ooka, the President of the Asia Pacific Federation for Non Destructive Testing (APFNDT), and was well attended by Asia-Pacific members. The conference was also attended by ICNDT executives, the President of the European Federation for Non-Destructive Testing (EFNDT) and leaders from interregional national societies, including Austria, Brazil, France, Germany, Hungary, Sweden, Spain and the UK. The event attracted global participants, strengthening the cross-communication between Asia-Pacific, Pan-America and Europe.

The market outlook for 2018 seems promising. NDT plays a vital role in the construction, aviation, oil & gas, power and petrochemical industries. According to MarketsandMarkets, the NDT market is expected to be worth US\$12.06 billion by 2023, growing at a compound annual growth rate (CAGR) of 7.83% between 2017 and 2023. Factors that are driving the market growth include continuous advancements in electronics, automation and robotics, growing adoption of Internet of Things (IoT) solutions and the need to prolong the lifespan and increase the capability of ageing assets.

The new system standard ISO/IEC 17025:2017 has been published and NDT laboratories are expected to switch their accreditation to the new standard within the next three years. The ICNDT Multilateral Recognition Agreement (MRA) for Personnel Certification is expected to grow this year, with more certification bodies from Europe and Asia set to achieve Schedule 2 recognition. The ICNDT Executive Committee recommends that certification bodies operated by national societies uphold the control measures required to deliver robust NDT certification.

The 12th ECNDT will be held between 11-15 June 2018 in Gothenburg, Sweden. I would encourage all members to join and support the regional conference. ICNDT will implement the updated constitution and operating procedures this year in conjunction with the 12th ECNDT.

I am saddened to announce that early in the year we lost Dr Baldev Raj, one of our Past Chairmen and Honorary Members. My sincere condolences to the immediate family members. Dr Raj's innovations and contributions to the NDT society will live on. Rest in peace, Dr Raj.

I wish all readers of the ICNDT Journal a successful year ahead.

*Ir Sajeesh K Babu, Chairman, ICNDT*

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**New ISO standard**

The new version of ISO/IEC 17025, the international reference for testing and calibration laboratories, was published by ISO and the International Electrotechnical Commission (IEC) in November 2017. ISO/IEC 17025 was revised by laboratory experts from all over the world, along with 18 ISO/CASCO (ISO's committee on conformity assessment) liaison organisations and many associations representing laboratories.

More information about the new standard and its main changes is available in the ISO news archive ([goo.gl/SHb1RR](http://goo.gl/SHb1RR)) and the brochure dedicated to the new version of the standard ([goo.gl/rZ5E2p](http://goo.gl/rZ5E2p)).

A PowerPoint presentation has been prepared by the convenors of the ISO/CASCO Working Group 44, who revised the standard. The presentation is freely available at: [goo.gl/ZMPxST](http://goo.gl/ZMPxST)

The Spanish Translation Task Force (STTF) (ISO/CASCO) has completed its work and the standard is now also available in Spanish.

**ANDE™ Personnel Certification™ for NDE provisional Level III in the nuclear industry**

The American Society of Mechanical Engineers (ASME) has announced the introduction of the new ANDE Personnel Certification (ASME PC) programme. The ASME Non-Destructive Examination and Quality Control Inspection (ANDE) programme certifies proficiency in knowledge, skills and performance for non-destructive evaluation (NDE) personnel. Initially, ANDE will focus on the nuclear industry throughout the USA and internationally. Longer term, it will expand to include non-nuclear NDE and quality control (QC) inspection.

Applications are now being accepted for UT Provisional Level III certification for

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## ICNDT Journal



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**Material for the next ICNDT Journal should be sent to Sharon Bond, email: s.bond@cinde.ca**

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the nuclear industry. ANDE certification has the potential to fundamentally change NDE certification worldwide.

Further information is available at: [goo.gl/q9Qf2q](http://goo.gl/q9Qf2q)

### ISEMIR IR tool

The International Atomic Energy Agency (IAEA) is offering the Information System on Occupational Exposure in Medicine, Industry and Research (ISEMIR IR) – a tool for NDT companies carrying out industrial radiography to improve implementation of optimisation of occupational radiation protection.

The tool is available free of charge. It collects dose information as well as information about the radiation protection habits of the NDT company. After submission of the data, the companies are able to automatically access analysis information, such as trends over time. They can also benchmark their staff and company against others in the database. The data is collected worldwide and is kept strictly confidential.

[www.iaea.org](http://www.iaea.org)

Your new ICNDT Journal is available to download from [www.icndt.org](http://www.icndt.org)

# The Fifteenth International Conference on Condition Monitoring and Machinery Failure Prevention Technologies

## CM2018 / MFPT2018

From sensors, through diagnostics and prognostics, to maintenance

Monday 10th to Wednesday 12th September 2018  
East Midlands Conference Centre and Orchard Hotel, Nottingham, UK



**BINDT**  
THE BRITISH INSTITUTE OF  
NON-DESTRUCTIVE TESTING



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Co-located with  
NDT 2018



## Obituary

### Dr Baldev Raj

9 April 1947 - 6 January 2018

Dr Baldev Raj, Director of the National Institute of Advanced Studies (NIAS), Bengaluru, and former Director of the Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam, sadly passed away on the morning of 6 January 2018 in Pune, India, where he was attending a meeting at the Centre for Materials for Electronics Technology (C-MET).

The vast contribution of Baldev Raj to the Indian Fast Breeder Programme in general and to non-destructive testing, radio metallurgy, strategic materials and materials science are well known and documented.

Dr Baldev Raj was selected for many eminent positions, as evidenced by awards, fellowships of all four academies of Science and Engineering in India, the International Nuclear Energy Academy, the Institute of Directors, the Indian Academy of Social Sciences, the Academy of NDT International, the American Society for Metals, the German Academy of Sciences, the World Academy of Sciences and several others. He was Honorary Fellow of the International Medical Sciences Academy, the Indian Institute of Metals, the Indian Society for Non-Destructive Testing, the Indian Institute of Welding and the International Institute of Welding (IIW), where he was Vice President from 2009 to 2012.

Dr Baldev Raj was President of the World Conference on Non-

Destructive Testing in 1996, which was held in New Delhi, India, and he was made an Honorary Member of the International Committee for Non-Destructive Testing (ICNDT) in the same year. In 2004, he was awarded the ICNDT Sokolov Award for major contribution to NDT research. He had been a member of the British Institute of Non-Destructive Testing (BINDT) since 1988 and was appointed Honorary Fellow in 1993.



With about 500 plenary, keynote and invited speeches, numerous papers published and membership of some of the most eminent committees, councils and bodies in India and more than 30 countries worldwide, Dr Baldev Raj steered several large high-impact collaborative programmes with some of the most influential countries in the world.

Dr Baldev Raj's contributions to science policy and science diplomacy are recognised worldwide. He was honoured with the following: the Homi Bhabha Gold Medal; the H K Firodia Award; the Om Prakash Bhasin Award; the VASVIK Award; the National Metallurgist Award; the Lifetime Achievement Award of the Indian Nuclear Society; the Distinguished Material Scientist Award; the Padma Shri Award; and the Distinguished Alumni of Indian Institute of Science Award, among many other distinct honours.

Dr Baldev Raj had a passion for interacting with students and young professionals for mutual inspiration and service to society.

Our heartfelt condolences are extended to the family, friends and colleagues of Dr Baldev Raj.

## Report on meetings with UNIDO 8 June 2017

### Attendance for ICNDT

- Mike Farley, Past Chairman, ICNDT PGPC
- Harold Jansen, African Federation of Nondestructive Testing (AFNDT) Secretary and representative to ICNDT PGPC
- Sean Blake, The Southern African Institute of Welding (SAIW).

### Background

The United Nations Industrial Development Organization's (UNIDO) Sustainable Development Goal 9 is about industry, innovation and infrastructure, with the objective of 'building resilient infrastructure'. Also relevant to ICNDT are Development Goal 7 (affordable and clean energy) and Development Goal 3 (decent work and economic growth). This includes a focus on diversity and youth employment.

Bernard Bau, Industrial Development Officer in the Trade, Investment and Innovation Department, coordinated the meetings and is engaged in the West African Quality System Programme, which supports the implementation of the Economic Community of West African States (ECOWAS) quality policy. The programme includes accreditation of laboratories; to date, 21 are accredited with the support of the programme, but as yet none of them are in NDT, perhaps because the countries of focus have more interest in food and agriculture.

### Meeting with Director of Trade, Investment and Innovation

Bernard arranged a one-to-one meeting for Dr Mike Farley with Dr Bernardo Calzadilla-Sarmiento, Director of Trade, Investment and Innovation. Dr Calzadilla-Sarmiento suggested that ICNDT might participate in a side event at the UNIDO Least Developed Countries Ministerial Conference, taking place in Vienna from 23-24 November 2017. The conference is only held every four years and high-level stakeholders, ministers and advisors attend the event. Bernard was asked to follow this up with his colleagues

from the UNIDO Africa Bureau, who were the organisers of the event. Bilateral meetings were arranged with Anders Isaksson (involved in India) and Rafik Feki (who has a specific interest in the setting up of the Arab Accreditation Cooperation (ARAC)). The LDC conference was later discussed with Bashir Conde (Africa Bureau).

### Presentation to Trade, Investment and Innovation staff

Bernard Bau set up this opportunity and about 12 officers from the department of Trade, Investment and Innovation (TII) attended. Mike Farley gave a 20 minute presentation on 'The importance of NDT for industrial development'. He described the scope and importance of NDT technologies and the role and objectives of ICNDT and offered the services of ICNDT to support UNIDO in its objectives. Harold Jansen followed up with some information about ICNDT's African Federation for Non-Destructive Testing (AFNDT) and some ideas about where ICNDT and UNIDO might cooperate, including promotion of the role of women in NDT, e-learning and a market survey for NDT in Africa.

Questions/discussion included:

- NDT *versus* destructive testing;
- The cost of equipment *versus* personnel-related cost; some NDT equipment is of low cost (for example magnetic particle, dye penetrant and ultrasound equipment);
- The cost of indigenous labour *versus* expatriates;
- The use of NDT for food and agricultural products and large agricultural machinery;
- Sensors for the monitoring of bridges, including remote monitoring via satellite communications;
- The use of NDT methods for assessing rock slabs in quarrying; and
- The need for question banks in the French language.

UNIDO will be offered liaison membership of ICNDT as a result of the meetings.

## EUROPE

## Greek Society's 6th International Conference on NDT

The 6th International Conference on NDT of the Hellenic Society of Non-Destructive Testing (HSNT) and the 1st International Conference on Welding and Non-Destructive Testing 2018 (ICWNDT-2018) of the Welding Greek Institute (WGI), will be held from 22-24 October 2018 at the Eugenides Foundation Planetarium, Athens, Greece.

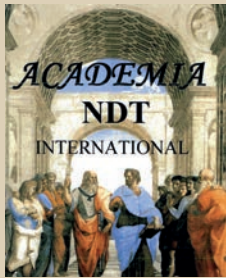
The aim of the conference is to bring together scientists, researchers and industrial engineers to exchange recent experiences in research and development activities in the field of NDT and welding, as well as to promote international collaboration in all related matters.

The conference organising committee, chaired by Professor Ioannis Prassianakis and Meletios Tzaferis, invites prospective delegates to present papers and posters in all relevant fields of NDT and welding and also to participate in the exhibition of related products, which will take place during the conference.

The main topics of the conference will include: advanced NDT and ultrasonic techniques; advanced joining processes; aerospace and marine; applications and innovations of NDT methods; applications for power generation (including nuclear technologies);

applications for the shipping and aerospace industries; composite materials, welding and adhesion; developments in automation of welding processes; developments in dissimilar materials joining; developments in pipeline construction; developments in welding consumables; developments in welding power sources technology; digital radiography; fundamentals and applications of the welding and joining process; industrial manufacturing; inspection, training and certification of welding and NDT personnel; microstructure and metallurgical behaviours in welds; modelling and simulation of welds and welded structures; NDT applications in the civil structures industry; NDT for the diagnostics and refurbishment of cultural heritage monuments; NDT in medical applications; NDT technology transfer; non-contact NDT methods; residual stress and distortion in weldments; testing and inspection for weld integrity; theoretical modelling; weld properties and performance; weldability of materials; welding consumables and equipment; and welding practices in industry.

For further information, contact: HSNT, PO Box 64066, Zographou, 157 10 Athens, Greece. Email: prasian@central.ntua.gr; Web: www.hsnt.gr



## Academia NDT International

*Science and Technology for Non-Destructive Testing and Diagnostics*

## European Research Day

*13 June 2018, Gothenburg*

**Morning session**

- 08:30 **Welcome address by the President of Academia**  
Speaker: Giuseppe Nardoni
- 08:45 **Keynote: The need of research for energy and environment**  
Speaker: Carlo Rubbia, Nobel Prize in Physics
- 09:30 **Reshaping Europe with research and innovation**  
Speaker: Tibor Navracscics, European Commissioner
- 10:05 **NDT integrity engineering**  
Authors: Peter Trampus and Vjera Krstelj  
Speaker: Peter Trampus, President of EFNDT
- 10:50 Coffee break
- 11:20 **First NDT Master's degree at Dresden International University**  
Speaker: Christian Boller, University Saarbrücken
- 11:55 **Construction of the first fusion reactor – ITER, Cadarache, France**  
Speaker: Bernard Bigot, Director General
- 12:30 **IAEA contribution to research and training for safety of people and protection of the environment**  
Speaker: Yukiya Amano, Director General
- 13:05 Lunch

**Afternoon session**

- 14:00 **Industry 4.0 – Overall significance and implications to NDT**  
Authors: Rainer Link and Nathanael Riess  
Speaker: Rainer Link
- 14:40 **Current developments in digital radiography and computed tomography from nanometer to macro scale**  
Speaker: Uwe Ewert
- 15:20 **The frontier of NDT at the 19th WCNDT – Munich 2016**  
Speaker: G Nardoni
- 16:00 Coffee break
- 16:30 **Non-linear signal processing workshop**  
Organised and moderated by Serge Dos Santos  
*A summary of this workshop will be used to prepare a guideline for the application of this technique.*

**Note: The European Research Day will be held as part of the 12th European Conference on Non-Destructive Testing, 11-15 June 2018.**

## International conference report: Application of Contemporary Non-Destructive Testing in Engineering

The Slovenian Society for Non-Destructive Testing (SSNDT) and the Faculty of Mechanical Engineering, University of Ljubljana, Slovenia, organised the 'Application of Contemporary Non-Destructive Testing in Engineering' 14th International Conference. The conference took place from 4-6 September 2017 in Portorož, Slovenia. The Scientific and Organising Committee of the conference was headed by Professor Janez Grum, President of the Slovenian Society for Non-Destructive Testing. The conference was attended by almost 80 participants, including distinguished guests such as: Professor Ivan Svetlik, Rector of the University of Ljubljana; Professor Mitjan Kalin, Dean of the Faculty of Mechanical Engineering, University of Ljubljana; Professor Stanislav Pejovnik, President of the Slovenian Academy of Engineering; Professor Iztok Golobič, President of the Association of Mechanical Engineers of Slovenia; Professor Pavel Mazal, President of the Czech NDT Society; and Dr Fermin Gomez, President of the Spanish NDT Society.

The conference was organised under the auspices of the EFNDT, which was greatly appreciated by the organisers.

60 papers were presented, two of which were given as keynote lectures:

- 'Signal processing for non-linear NDT and acoustic emission: new trends for future standardisation', by S Dos Santos and G Nardoni; and
- 'Novel monitoring technology for rotating machinery and structures', by L Gelman.

Six papers were given as invited lectures:

- 'Time-reversal localisation of continuous and burst acoustic emission under noise background', by Z Prevorovsky, J Krofta, J Kober and M Chlada;
- 'Standards for acousto-mechanical evaluation of multiscale

hysteretic properties of complex material with non-linear time-reversal imaging', by S Dos Santos, M Lints, D Arruga, A Masood and A Salupere;

- 'Identification of macroscopic lateral damages in RC slabs with rainy induced elastic wave activity', by T Shiotani, T Nishida, H Asaue, K Hashimoto, H Takamine, K Watabe and M Fukuda;
- 'Feasibility of acoustic emission-based structural health monitoring for railway axle under fretting fatigue damage', by M Carboni and A Gianneo;
- 'Condition monitoring of pneumatic cylinders by acoustic emission', by H Mahmoud, P Mazal, F Vlasic and M Jana; and
- 'Eddy current notebook and smartphone apps', by G Mook and Y Simonin.

The papers were presented in 11 sessions covering ultrasonic testing, electromagnetic, acoustic emission, thermal, infrared and radiographic techniques, NDT education and training and other methods. All of the papers presented were reviewed by the Scientific Committee and the 55 selected papers were published in the conference proceedings book and on the conference CD. Each participant received copies of both. The conference was also attended by eight exhibitors, who presented the latest NDT equipment and techniques.

The three-day event provided a forum for scientists, engineers, practitioners and end-users to review the latest developments, identify particular needs and opportunities for future advances, exchange knowledge and experience with other well-known experts and outline the milestones for further progress in the fields of NDT and NDE.

*Professor Janez Grum, SSNDT President.*

## 2nd International Conference on Diagnostics of Structures and Components using the Metal Magnetic Memory Method

Following the first Central and Eastern European Conference on the Metal Magnetic Memory (MMM) Method, which was held in Budapest, Hungary, in May 2014, the Hungarian Association for NDT (MAROVISZ) is organising the second in the series, to be held 24-25 April 2018 in the same city.

The physical basis of the MMM method is the effect of the magnetic field scattering due to structural inhomogeneity at the natural magnetisation of the metals. Based on this phenomenon, several practical inspection methods have been developed, allowing for quick diagnostics without any preparation of the test object (in some cases even through paint or insulation) by scanning along the surface, for example a length of pipeline, to locate magnetic anomalies corresponding to zones of stress concentration – the potential sources of degradation.

Focal points of the conference will be:

- Theoretical bases of the MMM method;
- Development of the MMM method in Europe, Russia and other countries;
- Practical examples of the application of the MMM method in the petrochemical industry, machine manufacturing, the power industry and transportation;
- Experience in the use of the MMM method in the inspection and lifetime assessment of pipelines, structures and components;

- Using the MMM method in fitness-for-service procedures and asset management systems; and
- Personnel training on the MMM method and training in the field of stress-strain state testing and engineering diagnostics.

The official language of the conference is English.

For further information, contact László Gillemot. Tel: +36 1 278 0632; Email: gillemot@marovisz.hu; Web: www.marovisz.hu

4th European Conference of the Prognostics and Health Management Society 2018

**PHME18**

3-6 July 2018  
Utrecht, The Netherlands

[www.phmsociety.org/events/conference/phm/europe/18](http://www.phmsociety.org/events/conference/phm/europe/18)



## Second edition of COFREND's 'Doctoriales'

The second edition of the French Confederation for Non-Destructive Testing's (COFREND's) Doctoriales was held from 28-29 November 2017 on the site of the the French Institute of Science and Technology for Transport, Spatial Planning, Development and Networks (IFSTTAR), in Marne-la-Vallée. During the two-day conference, the presentations made by the doctorands showed a panorama of ongoing research in French laboratories on NDE topics.

The doctorands, generally in their second or third year of thesis, had 25 minutes to present their work, time enough to examine scientific matters in depth. The work sometimes involved cutting-edge theory but was presented in a clear manner and was readily understood.

Subjects such as phased array ultrasonic testing (UT) imaging, digital modelling, monitoring of structures, inspection of adhesively bonded joints, etc, were developed, all of them topics that augur future technical innovations in NDE. Apart from the presentations, the quality of which deserves acknowledgement, the 'Doctoriales' are also a place for exchanging knowledge between academics and industrialists, doctorands and professionals and between specialists in the various methods.

As in the previous edition, the industrialists' poster session triggered discussions from the very first day and put forward the expectations of participants in the field. The next day, the exchanges continued in workshops centred on the career development and



The doctorands, generally in their second or third year of thesis, had 25 minutes to present their work

perspectives offered to doctors in the company and in NDE.

There was of course great conviviality during the two days, particularly during a much appreciated dinner in a place full of history, the Procope in Paris, and during a visit to the IFSTTAR laboratories. A new tradition has now been established with this second edition and the 'Doctoriales' will continue to be organised approximately every 18 months.

*Pierre Calmon, Vice President  
COFREND's Scientific and Technical Hub*

## Official launch of a school workshop at Le Mans University: ECND Academy

In its policy for the promotion of NDT careers, COFREND, among 50 public and private backers, has supported Le Mans University in the opening of its school workshop on non-destructive testing and evaluation.

To address the technological and economic changes facing industry, the school workshop aims to support the transformation of jobs in the NDT field, with an adapted programme of initial and continuing training.

The university offers a range of comprehensive non-destructive testing and evaluation training, from bac +2 to bac +8, with a speciality in acoustics and physics, and is open to employees, students, job seekers and people in professional retraining.



The university offers a range of comprehensive non-destructive testing and evaluation training, from bac +2 to bac +8

The Évaluation et Contrôle Non Destructifs Matériaux et Structures (ECND) Academy, created by Le Mans University, is

the result of a call for the 'Programme Investissement d'Avenir' project dedicated to the development of professional education and employment in non-destructive testing. It has been funded by la Caisse des Dépôts et Consignations. The Faculty of Sciences and Technics, IUT of Le Mans (University Technology Institute), ENSIM (National Engineering School) and the Continuing Education Department are also involved with the ECND Academy.

### Serbian Society for Non-Destructive Testing (SDIBR)



### International Conference 'NDT 2018'

*Srebrno Jezero/Danubia Park Hotel, Silver Lake, Serbia  
18-20 April 2018*

Conference topics include:

- NDT application, testing and inspection;
- Ecology, security and safety in NDT;
- Qualification, certification and accreditation; and
- Equipment, development and new NDT methods.

[www.sdibr.rs](http://www.sdibr.rs)

# 12<sup>th</sup> ECNDT

GOTHENBURG • SWEDEN • 2018



## WELCOME TO GOTHENBURG

for the 12th European Conference on Non-Destructive Testing  
 Swedish Exhibition & Congress Center Gothenburg, June 11–15, 2018



The conference will be arranged within the cooperation of the Nordic countries. The conference venue will be at the Swedish Exhibition & Congress Center in the city center. In connection to the venue is the Gothia Tower Hotel area. Together they represent the largest combined conference and hotel facility in Europe. Gothenburg, the second largest city in Sweden is situated on the beautiful west coast, right in the heart of Scandinavia.



[www.ecndt2018.com](http://www.ecndt2018.com)  
[ida.eriksson@csmndt.se](mailto:ida.eriksson@csmndt.se)

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PAN-AMERICA

## News from the American Society for NDT

### Bringing NDT to Girl Scouts

G.I.R.L. 2017, the triennial Girl Scout National Convention, was held in Columbus in early October 2017. ASNT promoted NDT as an exhibitor for the first time at this massive event. With over 10,000 girls, leaders and speakers in attendance, ASNT showcased NDT methods, colouring sheets and a video of ASNT women on the job at work sites around the world. The exhibit booth benefited from the enthusiastic support of two female member volunteers (one of whom is a Girl Scout) who articulated their first-hand experience in NDT and demonstrated the methods for eager girls and leaders. Even with a scuba experience, live animals and Girl Scout cookie sampling in the Hall of Experiences, ASNT was one of the most popular exhibits.



ASNT member (and Girl Scout) Allison Wright discusses MT principles with girls at G.I.R.L. 2017

### 2017 ASNT Annual Conference draws standing-room only turn out

Anyone who attended the 2017 ASNT Annual Conference in Nashville would have seen why this is an event experience that the NDT industry looks forward to each year. The sold-out tradeshow floor hosted over 200 exhibitors with new technology and solutions to meet the needs of every NDT professional's clientele. From the opening reception to the daily lunches, attendees enjoyed the wonderful selection from the Gaylord Opryland Resort and Convention Center – which is turning out to be a favourite location.



Nashville recording artist and producer Robin Crow entertains as keynote speaker of 2017 ASNT Annual Conference

Knowing how long and busy conference days can be, the keynote speaker Robin Crow provided an entertaining kick-off to the first full day of conference activities. Attendees heard

the impressive authentic guitar stylings of this Nashville artist and producer, as well as being reminded that keeping a fresh perspective on meeting client needs is key to sustained client renewals and growth.

During the ASNT Day of STEM at the 2017 ASNT Annual Conference, over 150 students and educators ascended on the Gaylord Opryland Resort to discover NDT. At the start of the event, BINDT's Caroline Bull greeted the students and introduced a video, 'The unseen world of NDT', as a primer for the day to follow. The students then toured different stations demonstrating NDT and visited the tradeshow floor to hear exhibitors discuss their technology and their roles in the NDT industry.



ASNT Executive Director Army Bereson welcomes BINDT President Caroline Bull to the ASNT Day of STEM

### ASNT examinations are in your community

Access to ASNT examination test sites has increased exponentially for examination candidates around the world. Gone are the days of looking on the ASNT website for a group examination given a couple of times a year in a nearby country. Computer-based testing (CBT) brings access to a worldwide network of thousands of test centres at your fingertips.

After application approval, candidates have the flexibility of scheduling their CBT online, available 24/7, or by phone. Whether a test centre is chosen due to workplace proximity or convenience in relation to a residential address, ASNT is now able to provide candidates with greater ease of access.

How can ASNT possibly allow so many sites to provide its certification examinations? Pearson VUE CBT provides an excellent level of security to ensure the integrity of the examination, testing environment and candidate identification at each location. Paper examinations can create an unfortunate opportunity for breaches. While ASNT has mitigated such occurrences, being proactive in avoiding them is a priority.



### Closing the cultural gap

ASNT's reach around the world is evident in the international composition of members and certificate holders. Being culturally competent and responsive to the needs of its stakeholders is paramount to the society. Last year, ASNT launched a programme of special relationships with some NDT partners in different countries. These partners are recognised as National Sponsoring Organisations (NSOs). NSOs host computer-based testing (CBT) locations and/or assist candidates residing in their respective countries with the timely completion of examination applications.

ASNT created a portal for NSOs to see everyone in their area who has submitted an application for an ASNT examination. If there are outstanding requirements or assistance is needed in acquiring necessary documentation, ASNT sends a message to the NSO through the portal with specific information relevant to the applicant. Even though candidates will receive an email advising them of any application issues, the NSO portal will notify the NSO to reach out to the candidate and offer assistance. Recognising that language, time zone differences and postal service may be a challenge in timely communication with ASNT staff, the NSO acts as a proxy for ASNT in communicating with the applicant. The NSO portal will provide an immediate communication link between ASNT and the NSO to more quickly resolve incomplete applications.

A special benefit of the NSO partnership is that candidates are able to remit the application and examination fee to the NSO in the local currency. The NSO will convert and tender collected monies in US dollars on behalf of the candidates.

### Make sure ASNT events are in your calendar

ASNT's world-class symposia and conferences are among the industry's finest in content and execution. ASNT has a commitment to meet diverse industry needs and produces annual and topical events that are relevant, engaging and important in keeping NDT thought leaders, technicians/inspectors, managers, business leaders and stakeholders connected and working in concert.

Research 2018	26-29 March	Orlando, FL
Aerospace 2018	5-6 June	St Louis, MO
Digital Imaging 2018	26-28 June	Mashantucket, CT
*6th Japan-US NDT Symposium	8-11 July	Honolulu, HI
SMT and NDT-CE 2018	27-29 August	New Brunswick, NJ
ASNT Annual Conference 2018	28-31 October	Houston, TX
2019 ASNT Research Symposium	April 2019	Garden Grove, CA
ASNT Annual Conference 2019	November 2019	Las Vegas, NV

\*JSNDI is the lead society for this 2018 event

Note: Exact 2019 dates have not yet been released as the programme is still being determined; however, locations are confirmed.

## News from the Brazilian Association for NDT and Inspection

### Mercosur Meeting on Normalisation addressed NDT methods

Brazilian and Argentinian experts came together for the 21st Mercosur Meeting on Normalisation, which was held on 3 October 2017. Due to the current economic scenario, representatives of Brazil participated in the discussions via WebEx, an online tool that allows for remote attendance, at ABENDI's facilities. The other experts attended the discussions at the Engineering College of the Universidad Nacional del Comahue, in Neuquén, Argentina. The agenda addressed the following NDT methods: ultrasound testing (UT), acoustic emission (AE) and X-ray, in addition to superficial methods of liquid penetrant (LP) testing, magnetic particle inspection (MPI) and visual testing (VT).

The discussions on the superficial methods have been focused on the reviews of the Mercosur standards, based on ISO standards. The following have been defined as the 2017/2018 action plan:

- ABNT NBR NM 328:2011 – Non-destructive testing – Magnetic particles – Terminology, to be reviewed by adopting as reference the standard ISO 12707:2016 – Non-destructive testing – Magnetic particle testing – Vocabulary
- ABNT NBR NM 334:2012 – Non-destructive testing – Liquid penetrants – Detection of discontinuities, to be reviewed based on ASTM E165:2009 – Standard practice for liquid penetrant examination for general industry, and standard ISO 3452-1:2013 – Non-destructive testing – Penetrant testing – Part 1: General principles
- ABNT NBR NM 327:2011 – Non-destructive testing – Liquid penetrants – Terminology
- ABNT NBR NM 329:2011 – Non-destructive testing – Visual Testing – Terminology.

The experts of the Acoustic Emission Commission have decided to adopt the standard ISO 18081:2016 – Non-destructive testing – Acoustic emission testing (AT) – Leak detection by means of acoustic emission. Thus, a technical interpretation of the text will be performed in order to publish it as a Mercosur standard.

As a plan for 2018, the following reviews of the standards have been established:

- ABNT NBR NM 302 – Non-destructive testing – Acoustic emission (AE) testing – Terminology
- ABNT NBR NM 303 – Non-destructive testing – Analysis of the acoustic emission of structures during controlled stimulation
- ABNT NBR NM 304 – Non-destructive testing – Acoustic emission testing for seamless steel cylinders
- ABNT NBR NM 333 – Non-destructive testing – Continuous monitoring of acoustic emission – Procedure.

The adoption and publication, as a Mercosur standard, of the ISO 19232 series, Non-destructive testing – Image quality of radiographs, was the main discussion topic of the industrial X-ray commission. The decision resulted in the following topics being selected for the next year:

- Part 1: Determination of the image quality value using wire-type image quality indicators;
- Part 2: Determination of the image quality value using step/hole-type image quality indicators;
- Part 3: Image quality classes;
- Part 4: Experimental evaluation of the image quality values and the image quality tables; and
- Part 5: Determination of the image unsharpness value using duplex wire-type image quality indicators.

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The meeting was concluded with the topic of ultrasound. The consensus was to review the standard ABNT NBR NM 335:2012 – Non-destructive testing – Ultrasound – Terminology, based on the standard ISO 5577:2017 – Non-destructive testing – Ultrasonic testing – Vocabulary.

In 2018, the Argentinian experts will analyse the Brazilian proposal to adopt, in the scope of Mercosur, the standard ABNT NBR 16553:2016 – Non-destructive testing – Ultrasonic testing – Phased array – Terminology, developed by the Brazilian experts, supported by the EN 16018 standard, Non-destructive testing – Terminology – Terms used in ultrasonic testing with phased arrays.

Another important item addressed, which will also be included in the agenda of the discussions in 2018, refers to the reviews of the following standards:

- ABNT NBR NM 330:2011 – Non-destructive testing – Ultrasonic testing – General Principles
- ABNT NBR NM 336:2012 – Non-destructive testing – Ultrasonic testing for welds – Procedure.

The next meeting of the Mercosur Committee will be held on 30 August 2018, during the National Congress of Non-Destructive Testing and Inspection (ConaEnd&IEV 2018), by the Brazilian Association for NDT and Inspection (ABENDI) in São Paulo.

Please feel free to join the normalisation meetings. Email: [normalizacao@abendi.org.br](mailto:normalizacao@abendi.org.br).

### ABENDI opens the international NDT conference

Upon gaining prestige and importance in the NDT and inspection field at an international level, ABENDI opened one of the major global events of the industry: the Annual Conference of the American Society for Nondestructive Testing (ASNT), held in November, in Nashville, USA. At the event, ABENDI held the second edition of the special session on Flexible Riser Integrity Management (FRIM) in partnership with the American institution, where a Petrobras engineer, Alexandre dos Santos Cordeiro, conducted a presentation with a subsequent discussion. Army Bereson, ASNT Executive Director, highlighted the technical quality of the session and, in addition, emphasised the satisfaction of having a cooperation agreement with ABENDI. The first edition of FRIM was held in May during the Conference on Equipment Technology (COTEQ) and the third will be held in August 2018 at ConaEnd&IEV.

João Conte, Executive Director of ABENDI, said: “Although the current moment is unfavourable for expenses with travelling, ABENDI has an international reliability, achieved throughout 38 years of work, that should be maintained at any cost”.

### The largest Brazilian event on technology in industrial inspection is coming soon: ConaEnd&IEV 2018

At least 40 companies and 1000 participants are expected to attend the National Congress of Non-Destructive Testing and Inspection (ConaEnd&IEV 2018), with 200 technical presentations to be included. With eight months still to go, the expectations already indicate that the event, in which themes that impact the routines of companies and research centres involved with the inspection of equipment and service provision will be discussed, will be a success. With representatives of large companies, such as Petrobras, and the support of renowned institutions, such as ABNT, this meeting is expected to affect the productive chain of the country.

The 36th edition, promoted by the Brazilian Association for NDT and Inspection (ABENDI), will take place between 27-29 August 2018, in São Paulo, and will contain much knowledge and innovation, which is key to opening the door to industrial development. The below industries will be involved in the programme:

- Aerospace
- Automotive
- Civil construction
- Electromechanical
- Energy
- Railway
- Mining and cement
- Naval
- Oil & gas
- Pulp and paper
- Petroleum and petrochemical
- Quality and management
- Safety
- Steel and metallurgy.

The central objective of the event is to present the most recent inspection technologies. At the event, ConaEnd&IEV also makes way for four parallel events: the NDT and Inspection Championship, the 4th ABENDI Annual Meeting on Accreditation of Personal Competences in Explosive Environments, the ISO/TC 135 Meeting and the International NDT Aerospace meeting, a partnership between ABENDI and the American Society for Nondestructive Testing (ASNT).

ConaEnd&IEV is a chance to defend ideas, join forces and collaborate with the development of the country. In addition, the technical work selected will be available in ConaEnd&IEV collection, published in *Revista ABENDI*, and will also be worth points for recertification purposes by the structured credit system.

More information is available at: [www.conaend.org.br](http://www.conaend.org.br)

## 45th Annual Review of Progress in Quantitative Nondestructive Evaluation Conference

# QNDE 2018

15-19 July 2018  
Vermont, USA

Contact: Jennifer Vit, Conference Planning & Management, Iowa State University,  
1601 Golden Aspen Drive, Suite 110, Ames, IA 50010, USA

[www.qndepograms.org](http://www.qndepograms.org)



## ASIA-PACIFIC

## Regional conference with international participation

The 15th Asia Pacific Conference for Non-Destructive Testing (APCNDT) was successfully hosted by the Non-Destructive Testing Society (Singapore) (NDTSS) from 13-17 November 2017 in Singapore. The conference was held at the Marina Bay Sands Expo and Convention Centre – part of Singapore's iconic Marina Bay Sands complex on the banks of the Singapore River. It was an occasion of great scientific and technological relevance in the field of non-destructive testing (NDT) to the Asia-Pacific region. Conference President Mr Sze Thiam Siong, along with his team of committee members, delivered a world-class conference that was well received by local and international delegates. The conference was spread over four and a half days, with daily keynote lectures, conference papers presented in multiple parallel sessions, poster sessions and a technical exhibition.



Welcome remarks were given by ICNDT Chairman Mr Sajeesh Babu

The conference was formally opened by Ms Choy Sauw Kook, Assistant Chief Executive, SPRING Singapore. Welcome addresses were provided by Mr Sajeesh Babu, Chairman of ICNDT and President of NDTSS, and Dr Norikazu Ooka, the President of the Asia Pacific Federation for Non Destructive Testing (APFNDT), who welcomed the APFNDT Members and the conference participants by providing an overview of the history of APCNDT. Past APCNDT Presidents from India, Japan, New Zealand and Korea participated in the conference. The opening keynote address was given by Dr Mike Farley, Past Chairman of ICNDT, and focused on research and development in NDT.

The conference opened with a traditional lion dance, a symbol of strength, unity and blessings for a new beginning.

The Scientific Committee, led by Dr Andrew Malcolm, reviewed and accepted 222 papers from authors representing 30 countries. There were seven invited keynotes and one opening address with 196 oral presentations and 18 poster presentations. The presentations covered both traditional NDT technologies, such as ultrasonic testing, radiography and visual testing, and latest generation technologies, such as terahertz imaging, computed tomography and seismic inspection. The application of NDT in specialist areas, such as structural health monitoring, additive manufacturing and materials characterisation, was presented, as well as the role and impact of various technologies, including cloud computing, the Internet of Things (IoT) and big data. A section of the programme was dedicated to issues related to the training and certification of NDT practitioners. Three workshops were delivered in conjunction with the conference.

The event was attended by 603 participants and 853 trade visitors. The majority of the attendees were delegates from Singapore, China, Japan, South Korea, Germany, India and Australia, but many other countries were also represented. The NDTSS President, Executive Committee, Organising Committee

and Members thank all the delegates, participants, exhibitors, sponsors and supporting NDT societies for their strong support and contributions.



The conference was opened with a traditional lion dance

#### MOU

NDTSS signed two bilateral memoranda of understanding (MOU) with the Indian Society for Non Destructive Testing (ISNT) and the Malaysian Society for Non-destructive Testing (MSNT) during the conference to enhance cooperation in membership, training and certification, education and research.

NDTSS presented its first ISO 9712 certification during the conference; the certification was achieved as a result of the Integrated Work Study Programme (IWSP) developed by the Singapore Institute of Technology (SIT) and NDTSS. The programme is the first of its kind in the region and is expected to attract young graduates to the industry.



NDTSS signed two bilateral MOU with ISNT and MSNT

#### Exhibition

In parallel with the scientific programme was a technical exhibition featuring 81 booths showcasing the latest in NDT technologies, instrumentation and systems. The exhibitors included equipment developers, service providers, research institutes and training agencies drawn from 23 countries around the world.

#### Meetings

Several APCNDT and ICNDT meetings took place during the conference, including the APFNDT General Assembly and the ICNDT Policy and General Purpose Committee (PGPC) meetings. The conference also hosted the ISO/TC 135 and SC 7 meetings.

The next APCNDT will be held in 2021 in Melbourne, Australia.

## CALENDAR OF NDT EVENTS

Month	Date	Venue	Event	Contact
April 2018	10-12	Bristol UK	Aerospace Event 2018	conf@bindt.org www.bindt.org
	24-25	Budapest Hungary	2nd International Conference on Diagnostics of Structures and Components using the Metal Magnetic Memory Method	gillemot@marovisz.hu www.marovisz.hu
May 2018	7-9	Leipzig Germany	Annual Conference of the German Society for NDT (DGZfP Jahrestagung 2018)	tagungen@dgzfp.de www.dgzfp.de
	15-17	Virginia Beach USA	MFPT 2018: Intelligent Technologies for Equipment and Human Performance Monitoring	amy@mfpt.org www.mfpt.org
	27-1 Jun	Poitiers France	12th International Fatigue Congress	fatigue2018@sf2m.fr www.fatigue2018.com
June 2018	5-6	Missouri USA	Nondestructive Evaluation of Aerospace Materials & Structures	conferences@asnt.org www.asnt.org
	11-15	Gothenburg Sweden	12th European Conference on Non-Destructive Testing (12th ECNDT)	ecndt2018@meetx.se www.ecndt2018.com
	24-29	Berlin Germany	14th Quantitative InfraRed Thermography Conference (QIRT 2018)	tagungen@dgzfp.de www.qirt2018.de
July 2018	3-6	Utrecht The Netherlands	4th European Conference of the Prognostics and Health Management Society 2018 (PHME18)	jean-baptiste.leger@predict.fr www.phmsociety.org/events/ conference/phm/europe/18
	8-11	Hawaii USA	6th Japan-US NDT Symposium: Emerging NDE Capabilities for a Safer World	conferences@asnt.org www.asnt.org
	10-13	Manchester UK	9th European Workshop on Structural Health Monitoring (EWSHM 2018)	ewshm2018@bindt.org www.ewshm2018.com
	15-19	Vermont USA	45th Annual Review of Progress in Quantitative Nondestructive Evaluation Conference (QNDE 2018)	jvit@iastate.edu www.qndepgrams.org