

# INDUSTRIAL

# EYE

THE OFFICIAL JOURNAL OF THE AUSTRALIAN  
INSTITUTE FOR NON-DESTRUCTIVE TESTING

RADIOGRAPHY ■ ULTRASONICS ■ EDDY CURRENT ■ PENETRANT ■ MAGNETIC PARTICLE  
VIBRATION ANALYSIS ■ LUBRICATION ANALYSIS ■ THERMOGRAPHY ■ ACOUSTIC EMISSION

JULY/AUGUST 2024 VOLUME 11 | NO 4

AINDT



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# President's Message

## AINDT Conference: Newcastle 2025



Joshua Morris

I am pleased to announce that the AINDT will be holding its next major conference in Newcastle, from 18 to 20 November 2025. The conference will bring together all aspects of the non-destructive testing (NDT) and condition monitoring (CM) industries with three streams being covered over the two full days of the conference.

The Institute has booked the Newcastle Town Hall to host the conference and is also looking to collaborate with various industries in Newcastle to facilitate site visits. I encourage you to save these dates in your diary. While November 2025 seems a long way away, it will come around sooner than we think. In the coming months, the Federal Office will be speaking with potential sponsors and exhibitors as well promoting the event via its regular communication channels.

While the conference held in Melbourne was part of our Asia Pacific NDT network, this conference will be solely run by the AINDT. If I don't see you before than I look forward to seeing you in Newcastle in November 2025.

### Governance Review

In January at the AINDT's Extraordinary General Meeting (EGM), where myself and the other Directors were ratified, a motion was put forward that we conduct an independent governance review of the AINDT.

I am pleased to inform members that this review is nearing its completion, with findings to be presented to the AINDT's Board of Directors in the coming month.

The Institute engaged Sonya Beters, the Managing Director of Governance by Design, to conduct the review. Sonya has a wealth of expertise in relation to both governance and legal advisory having worked with many peak industry bodies around the country.

The review has been tailored to recognise the needs of the organisation into the future and is investigating whether the current governance architecture is 'fit for purpose' and facilitates effective decision making.

Three of the five steps have been completed. These include:

**Step 1:** Initial Briefing (Completed)

**Step 2:** Full Governance Analysis including detailed Constitution Review (Completed)

**Step 3:** Interviews (Completed)

**Step 4:** Governance Effectiveness Outcomes Report (Nearing completion)

**Step 5:** Meeting the Board (Late September)

Following the delivery of the final report and meeting with the Board, the Directors will consider the findings and present their recommendations to the Federal Council.

Warm regards,

**Joshua Morris, President**  
**Australian Institute for Non-destructive Testing**



AINDT will be holding its next major conference in Newcastle, from 18 to 20 November 2025.



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### INSTRUCTIONS TO AUTHORS OF TECHNICAL ARTICLES

Manuscripts should be submitted in electronic form:

1. in word
2. typed with single spacing
3. with figures as tif or jpeg files at better than 300dpi

Manuscripts should include:

1. symbols and abbreviations conforming to recognised standards; metric units (SI)
2. references listed, after the text, in the order in which they occur in the paper
3. references indicated in the text by arabic numerals in square brackets
4. tables and figures numbered separately but consecutively with Arabic numerals and brief, descriptive titles

5. a reference in the text to all tables and figures
6. graphs and diagrams made with lines of sufficient thickness to reproduce well
7. titles and address of authors

Procedure for submission of manuscripts:

1. articles should be sent to: journal@aindt.com.au
2. manuscripts will be submitted to referees who will remain anonymous
3. reprints of each paper will be supplied free to the author

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# A Message from the CEO

## AINDT to Meet Defence Industry Minister



Stuart Norman

The AINDT has secured a meeting with the Federal Minister for Defence Industry, the Hon Pat Conroy MP to discuss non-destructive testing (NDT) traineeships. On 22 March this year, Minister Conroy reaffirmed the intention of the Albanese Government to continue collaborating with AUKUS partners.

The announcement encompassed key areas such as industry, workforce, and international placements. However, it was the segment on workforce that particularly drew the AINDT's attention. Here's an excerpt from the announcement:

Today, we are pleased to announce new initiatives through the Skills and Training Academy to develop Australia's workforce to build and sustain our nuclear-powered submarines.

These pilot programs will be delivered in close consultation with Australia's Sovereign Submarine Build Partner, Sovereign Submarine Sustainment Partner and the shipbuilding industry and include:

- Non-Destructive Testing Traineeships to grow the testing technician workforce.

- Development of Australia's welding and fabrication pipeline, including:
  - The Welding Aptitude Testing Initiative, providing entry-level workers and mid-career skilled workers opportunities to test their skills and explore welding careers in shipbuilding.
  - A welding bridging initiative for new entrants, existing workers and advanced apprentices in adjacent industries to uplift their skills to fill welding roles in shipbuilding and the nuclear-powered submarine program.

Following this announcement, the AINDT wrote to Minister Conroy to request a meeting to discuss how the Institute could assist in the delivery of NDT traineeships. AINDT is the ideal body to assist in the delivery of these traineeships and the certification of qualifications upon their completion.

While the announcement by the Albanese Government was focused on Australian industry involvement and creation of jobs during the build of Australia's next generation conventionally-armed, nuclear-powered submarines, it is our hope that any future partnership would extend into other defence projects.

**It is anticipated that the whole-of-nation undertaking will see approximately 20,000 jobs created right across the country. The Albanese Government is also looking to use this opportunity to build a Future Made in Australia, by Australians, with record investment in defence, skills, jobs and infrastructure.**

AINDT is looking forward to working constructively and collaboratively with the Albanese Government and Minister Conroy not just on this project, but on many more into the future.

We will continue to keep members and the broader industry informed on the progress of our discussions as we work to advance the NDT and CM professions.

### **AINDT State Branch AGMs**

This year, I had the distinct privilege of attending each of the AINDT State Branch AGMs. It was a pleasure meeting so many dedicated members. I am continually impressed by the remarkable level of volunteerism

within the AINDT. I want to personally thank the state branch committees and everyone who made these events possible.

**Additionally, I'd like to express my deep appreciation to both past and present office bearers, whose generous contributions of time and effort have been instrumental in our institute's success.**

I would also like to take this opportunity to thank each of the sponsors who participated. In doing so, they are not just supporting the state branches and the federal office but also the broader NDT industry. Many may not be aware that the sponsors also provided prizes to each of the award winners.

**Congratulations to each of the 2023–2024 award winners. In speaking with award winners, it is hard not to be impressed by their level of dedication and determination to pursue a long and fruitful career in the NDT industry.**

One of the most significant takeaways from attending the AGMs was the remarkable diversity of our membership. Our community includes both stalwarts of the industry and individuals from diverse cultural backgrounds born all over the world.

I was pleasantly surprised to observe that the majority of the Institute's members are younger than I had anticipated. This is encouraging, as it indicates we have a vibrant and dynamic membership that is eager to engage both professionally and socially.

As CEO, I am committed to not only growing our membership but also enhancing engagement and harnessing the diverse talents within our industry.

### **New Certification Service Manager**

As many of you would already be aware, we recently appointed Peter Dawson as AINDT's Certification Services Manager. Peter joins us with significant experience from his time working at NATA.

Peter started with us in late July and has been focused on ensuring our certification system and approved Authorised Qualifying Body (AQB) are operating in line with standards.

Peter joins us at an exciting time as we enhance our operational capabilities and upgrade our IT systems, including our database. These improvements will provide the foundation necessary for us to best serve our members and effectively manage the certification system.

Having Peter join us allows AINDT to dedicate someone exclusively to the certification system, enabling us to deliver a world-class professional certification scheme.

Best Regards

**Stuart Norman, CEO**  
**Australian Institute for Non-destructive Testing**



United States Submarine USS Ashville in Perth, Western Australia, following the international AUKUS announcement.



Submarine HMAS Rankin sails on the surface in the waters north of Darwin.



Federal Minister for Defence Industry, the Hon Pat Conroy MP speaking during the AUKUS Nuclear Submarine announcement at Osborne Naval Shipyard in Adelaide.

# Member List

March 2024

The AINDT is a national peak body that promotes the professional practices of non-destructive testing and condition monitoring personnel. Our mission is to provide members, industry and the community with independent and professional service in relation to the science and practice of non-destructive testing.

Through the work of our state branches and federal office, AINDT is committed to fostering a community of professionals and organisations dedicated to the fields of non-destructive testing, engineering, and materials and quality testing.

We offer a tiered membership structure, inviting businesses to enhance their professional standing and industry influence by becoming a Company, Corporate, or Sustaining member. Our memberships unlock a suite of benefits, including marketing opportunities, heightened support, streamlined staff certification management, and much more.

AINDT would like to thank the companies below for their valued support.

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# RENEW YOUR MEMBERSHIP

## RENEW FOR REWARDS: STAY A STEP AHEAD WITH 2024-2025 AINDT MEMBERSHIP

Whether you're looking to enhance your knowledge, expand your network, or influence industry standards, AINDT is your gateway to success. Connect with top professionals and thought leaders in an environment that celebrates innovation and progress. Just some of the member benefits are outlined below.

- ✓ Regular editions of the AINDT Journal (6 per year)
- ✓ Substantial discounts on certification fees and expenses
- ✓ Access to our online portal and resources
- ✓ Eligibility for exam and industry service awards
- ✓ A host of networking opportunities, including branch events, workshops, seminars, and our conference
- ✓ Exclusive Corporate Member benefits like free and discounted advertising rates, and technical advice

**AINDT  
MEMBERSHIPS  
ARE NOW DUE**

**RENEW NOW >>>**



# Condition Monitoring Certification Board Update



Shawn Moore

As highlighted in the last edition of this journal, the Condition Monitoring Certification Board recently conducted a trial of the new Cat 2 IRT mechanical examination paper. Approximately six people sat the examination under normal invigilated examination conditions.

The results of the examination were positive, and it was agreed that the paper is adequate for release and receipt of applications. Ongoing and further development of the paper will be carried out over time, with all certification examination papers undergoing reviews to ensure they are up to date and accurate.

The Board is conducting a review of the certification guide, ensuring the currency and accuracy of the document. The Board reviews the guide regularly to ensure the documentation is reflective of current operations and certification processes.

Candidates applying for Cat 2 IRT certification who for example, hold an electrical certification and then apply for mechanical certification will need to provide current evidence they have sat and passed a colour perceptions test (Ishihara Plate Test).

For this to be accepted it should be no more than 12 months old. The Certification Board will require it to be provided for each new sector of IRT certification applications received. If applying for multiple sector certification at the one time, only one colour perception test will be required.

Applications for IRT Cat 2 mechanical certification are currently being processed and certifications are being issued. Candidates are encouraged to now apply for Cat 2 IRT mechanical certification. This certification has been long needed, with many people enquiring in relation to obtaining certification. The commencement of the mechanical certification will boost the number of certificates being issued.

**Shawn Moore**  
Chairman – AINDT CM Certification Board

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# NDT Certification Board Update

As I write this update, I've recently returned from some time away in Germany and the Netherlands where along with the usual amazing tourist places of interest, I couldn't help but notice and be impressed by the scale of the industrial sectors in those hugely prosperous countries.

In almost every town and most cities there is clearly visible evidence of industries well known to us all in the non-destructive testing (NDT) sector. Renewable energy projects were visible everywhere along with projects in the aerospace, defence, heavy engineering, power, pharmaceuticals and traditional petrochemical industries.

There is no doubt that all these sectors rely to some degree on NDT service providers. This confirms that the future is bright for all of us who work in the field, particularly here in Australia with our vast array of resource projects and energy challenges.

However, I'm back to work now, and it's been an interesting few weeks settling into my new role as Certification Services Manager and getting to know the team at the AINDT Federal Office. My first impression is that they are a busy team who—on a daily basis—deal with many and varied enquiries regarding NDT training, examinations and recertification, along with processing the completed applications for renewal and recertification.

While becoming more familiar with the AINDT's internal processes for NDT training and certification, I've also

focused on connecting with our current group of AQB's and getting to know their capabilities, leadership and current concerns.

Once again, my first impressions are very positive, all four of our AQB's have capable, highly skilled and experienced teams in place and all are motivated to provide a high level of service to their students.

In addition, all of the AQB's have confirmed that they are looking to grow and develop their capabilities, offer a broader range of services and expand their locations and footprint. This will make the training and certification process more efficient and, in the long run, benefit our members.

In the previous edition of this magazine our president Josh Morris provided some detail and the Board's perspective on the progress towards adopting ISO 9712:2021 for all of AINDT's NDT certification moving forward. Much of that work is already well underway but there is still more work to be done. Our CEO has formed a working group including board members, NDT CB members and myself to focus on this matter. We will meet regularly until the transition is complete.

Finally, a quick reminder that the current AINDT Guide to Qualification and Certification Issue 22 Rev 04 is available on the AINDT website (via 'NDT Docs' in the main menu). It should be your go to document for all matters related to NDT personnel certification.

**Peter Dawson**  
Certification Services Manager



# Condition Monitoring Training Centres

Unlock the future of your career with top-tier condition monitoring training from trusted providers.

These training centres have earned the endorsement of AINDT, aligning perfectly with the national syllabi approved by the AINDT Certification Board. This ensures that you receive the highest standard of education and training.

To maximise your learning experience, AINDT recommends obtaining a copy of the training module—either directly from the training provider or by downloading it from the AINDT website. This will ensure you are well-prepared for your course.

For those seeking certification, it's crucial to successfully complete the specified training program and required training hours outlined in ISO18436. This is essential for achieving certification in your desired conditioning monitoring method, category, and industry sector.

All examinations are conducted by the AINDT. For exam dates and further details, please contact AINDT via: [federaloffice@aindt.com.au](mailto:federaloffice@aindt.com.au).

Elevate your skills and advance your career with the industry's best training and certification programs.

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### SRG Training Academy

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W: [woodplc.com](http://woodplc.com)

# Authorised Qualifying Bodies

AQBs are authorised to offer AINDT-approved training and initial and recertification examinations in any Australian state, at any time throughout the year.

The AINDT also conducts scheduled examination rounds twice yearly, with dates advertised in The Industrial Eye and the AINDT e-newsletter.

While the AINDT strives to notify certificate holders of impending certification expirations, it remains the responsibility of the certificate holder to initiate the renewal and recertification process before their certification expires. Please note that late fees apply to overdue certification applications.

## South Australia

### Kuzer Technical

T: 1300 199 086

E: [info@kuzer.com](mailto:info@kuzer.com)

W: [kuzer.com](http://kuzer.com)

NDT methods, levels, and industry sectors offered:

- Ultrasonic Testing 1, General Engineering
- Ultrasonic Testing 2, Welds
- Radiographic Testing 1,2 Welds
- Magnetic Particle Testing 1,2 Multisector
- Penetrant Testing 1,2 Multisector
- Visual/Optical Testing 2 Multisector
- Phased Array Ultrasonic Testing 2 Multisector
- Eddycurrent Testing 2 Multisector

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ATTAR

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- Computed and Digital Radiography 2, 3
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- Radiographic Testing 2,3 Welds, Casting, Aerospace
- Magnetic Particle Testing 1,2,3 Multisector, Aerospace
- Penetrant Testing 1,2,3 Multisector, Aerospace
- Eddy Current Testing 2,3 Multisector, Aerospace
- Magnetic Flux Leakage 2
- Tank Bottom Testing
- Phased Array levels 2 and 3 Ultrasonics 2 Multisector
- Visual/Optical Testing 2 Multisector
- Time of Flight Diffraction (TOFD) levels 2 and 3 Welds
- Heat Treatment
- ISO 9712 UT Level 2 Corrosion/Erosion Detection and Mapping (CDM)

## Western Australia

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- Magnetic Particle Testing 1,2,3 Multisector, Aerospace
- Penetrant Testing 1,2,3 Multisector, Aerospace
- Eddy Current Testing 2,3 Multisector, Aerospace
- Magnetic Flux Leakage 2
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- Penetrant Testing 1,2 Multisector
- Phased Array Ultrasonic Testing 2 Multisector

## Queensland

### Protecs Global

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E: [hamed.madani@protecsglobal.com.au](mailto:hamed.madani@protecsglobal.com.au)

W: [protecsglobal.com.au](http://protecsglobal.com.au)

NDT methods, levels, and industry sectors offered:

- Ultrasonic Testing 1 ( General Engineering) 2 Welds
- Magnetic Particle Testing, 2 Multisector
- Penetrant Testing, 2 Multisector

# NSW Branch Update

## Celebrating Garry Bowden: A Pillar of AINDT NSW Branch

It is with mixed emotions that we bid farewell to Garry Bowden, a stalwart member of the AINDT New South Wales Branch since the early 1980s. Over the decades, Garry has exemplified what it means to be an ambassador for AINDT, particularly in the aviation and aerospace sectors.

Garry's journey with the New South Wales Council has been marked by dedication and excellence. He has held various pivotal roles, including Branch Secretary, Treasurer, and Vice President, each for a significant number of years. His reliability and willingness to assist in all our activities have made him an invaluable asset to our council.

Garry's departure from the council leaves a void that will be deeply felt by all who have had the privilege of working with him. His unwavering commitment and enthusiasm have left an indelible mark on our community.

Although he has stepped down from the council, we are heartened to know that Garry will remain a member of AINDT and will continue to be actively involved in the aerospace sector. His expertise and passion will undoubtedly continue to inspire and drive our industry forward.

We extend our heartfelt gratitude to Garry for his years of service and dedication. He will be dearly missed but always remembered for his outstanding contributions.

As we move forward, we are grateful for the leadership and support of our current councillors:

- **Frank Galea:** President
- **Sam Hallifax:** Vice President
- **Paul Ashby:** Treasurer
- **Matthew Thompson:** Honorary Secretary
- **John Duenzl:** Events and Marketing
- **Stuart Smart:** Membership
- **Frank Edwards:** Councillor
- **Neil Burleigh:** Councillor
- **Chris Howson:** Councillor
- **Stephen Beath:** Councillor
- **Chris Charlesworth:** Councillor
- **Michael Cramer:** Councillor

Additionally, our Federal Council Representatives are Neil Burleigh, Stuart Smart, and Matthew Thompson.



L to R: Frank Galea (President, NSW Branch) presents Garry Bowden with an AINDT Appreciation Award.

**Exciting times lie ahead as we prepare for the 2025 Australian NDT Conference, set to be hosted in New South Wales. This event promises to be a landmark gathering, bringing together industry leaders, innovators, and practitioners to share knowledge, showcase new technologies, and foster collaboration.**

The AINDT Federal Office is working with the New South Wales Branch to ensure the conference is a resounding success, offering a rich program of technical sessions, workshops, and networking opportunities.

Together, we will continue to build on the strong foundation laid by dedicated members like Garry, ensuring the ongoing success and growth of AINDT.

# A Night to Remember: The AINDT NSW AGM and Dinner 2024

Ladies and gentlemen, strap yourselves in for a whirlwind recap of the AINDT New South Wales AGM and Dinner.

It was an evening filled with glitz, glamour, and a sprinkle of well-deserved recognition—all set against the breathtaking backdrop of Sydney Harbour, where the iconic bridge and Opera House played peekaboo with the setting sun.

The evening began at the Watersedge, a venue so magnificent it could make even the most seasoned Sydneysider do a double-take. Imagine the scene: twinkling lights reflected on the water, the Harbour Bridge standing tall and proud, and the Opera House whispering sweet nothings to the stars. As attendees arrived, the buzz of excitement was palpable. Or maybe it was the aroma of the delectable dishes being prepared in the kitchen—either way, the mood was electric.

Our gathering was not just about the picturesque views and scrumptious food. It was about celebrating the beating heart of our industry: the people. A round of applause erupted as we kicked off the awards ceremony. First up, the indomitable Lleyton Edward, whose dedication and hard work have been nothing short of legendary. Lleyton, you make ultrasonic excellence look easy, and we couldn't be prouder!

Next, we honoured Craig Taylor, a name synonymous with innovation and expertise in our field. Craig's triple win have been like a fine wine—getting better with age and leaving a lasting impression on all who encounter his work. Congratulations, Craig, on this well-deserved accolade. We look forward to seeing what groundbreaking feats you'll achieve next!

No celebration would be complete without acknowledging the cornerstone of our organisation. Garry Bowden, this one's for you. With over three decades of unwavering commitment, Garry has been the guiding star for the AINDT. From navigating the choppy waters of industry changes to steering us towards new horizons, Garry's contributions have been invaluable. Thank you, Garry, for your dedication, wisdom, and the occasional dad joke that kept our spirits high. Here's to many more years of your inspiring presence.

As the night wore on, the conversations flowed as freely as the wine. We shared stories, laughed until our sides hurt, and perhaps indulged in a bit too much dessert (not that anyone's counting!). The dinner at Watersedge wasn't just a meal; it was a culinary journey that took our taste buds on a ride as memorable as the evening itself.

In closing, the AINDT NSW AGM and Dinner was more than an event—it was a testament to the incredible community we've built together. To the award winners, the unsung heroes, and everyone who makes this



industry what it is, thank you. Here's to another year of excellence, camaraderie, and perhaps a few more unforgettable nights by the waterside.

We would also like to extend our heartfelt thanks to our generous sponsors. This event was made possible by Major Sponsors: HVT Inspection Services, EN DE TEK, and Smart Chem. Additionally, a big thank you to Chemetall, Smart Chem, Simplifi NII, and OMS Software for the \$250 cash prizes for this year's champions. Your support is instrumental in making events like this a success and fostering the growth of our industry.

Until next time, keep reaching for the stars—or at least the Harbour Bridge!

## WITH THANKS TO OUR SPONSORS



# Queensland Branch Update

## Celebrating Success and Looking Ahead

The AINDT Queensland Branch continues to thrive with a series of achievements and exciting events, marking a dynamic year of growth and excellence in non-destructive testing (NDT).

Throughout the year, the Queensland Branch has hosted a total of eight technical sessions covering various NDT modalities. These sessions have been instrumental in enhancing our members' skills and knowledge, thanks to the expertise shared by industry leaders and professionals. In addition, we have enjoyed two successful social events that fostered camaraderie and networking among our members.

### AGM Dinner Celebrations in Brisbane and Gladstone

The Queensland Branch is delighted to reflect on the success of our recent Annual General Meeting (AGM) dinners, held on 27 July in both Brisbane and Gladstone. These gatherings provided a platform for reviewing our achievements, strengthened our community bonds and set the stage for future endeavours.



Queensland Branch AGM in Brisbane.



Queensland Branch AGM in Gladstone.

### Recognition of Excellence: AINDT Award Winners

We proudly congratulate eight NDT professionals from Queensland for their outstanding achievements, recognised as winners of prestigious AINDT Awards. The dedication and contributions of these individuals have elevated our Branch and showcased Queensland's leadership in the NDT community.

Congratulations to all of the winners:

**Ashar Duncan Dann** AINDT Level 2 UT examination 2023

**Frolian Doring** AINDT Level 2 Penetrant Practical Exam  
**Ivan Colombo** AINDT Level 2 Eddy Current Examination 2023

**Kashif Iqbal** AINDT Level 2 for Penetrant Overall Exam Result

**Lee Richard Cutting** AINDT Level 2 for TOFD Specific / Practical exam 2023

**Marcus Wheeler** AINDT Level 2 General Penetrant Theory Exam 2023

**Martin Fleck** AINDT Level 2 for Phased Array UT Specific / Practical exam 2023

**Pingan Liu** AINDT Level 2 Overall Examination 2023

### Upcoming Event: Partnering with Emerson for a Condition Monitoring Seminar

We are excited to announce our upcoming condition monitoring event in partnership with Emerson, a global leader in technology and engineering solutions. This event will take place on Wednesday 28 August in Gladstone.

Join us for insightful discussions on wireless technology, compelling case studies, and updates on the evolving technology roadmap for Emerson's condition monitoring portfolio. See the page opposite for further details, and how to register.

### Join Us and Stay Engaged

As we move forward, the Queensland Branch remains committed to fostering innovation, knowledge sharing, and professional development within the NDT field. We encourage all members to actively participate in our upcoming events and initiatives.

Your engagement is vital to our continued success. Together, let's make the remainder of 2024 a year of continued growth and achievement.

# Emerson Connect



## Reliability Technology Solutions

Venue: Mantra Gladstone, Cnr Bell And O'Connell St  
Gladstone Central QLD 4680

Date & time: Wednesday 28th August, 9:00 am - 4:30 pm  
Thursday 29th August, 9:00 am - 4:30 pm

Emerson invites you to a day dedicated to Reliability Technology Solutions!  
Join us for insightful discussions on Wireless Technology, compelling case studies, and updates on the evolving Technology Roadmap for Emerson's Condition Monitoring Portfolio.

Day two offers exclusive training with Jason Caceres, Senior Reliability Engineer and Trainer at Emerson. Advanced users of AMS Machinery Manager Software will delve into optimising databases with enhanced Analysis Parameter sets and alarm management. For more details, check out page 2 of the flyer.

### AGENDA Day 1 (Free - open to all)

#### 9.30 Welcome and Introduction

##### Morning session

##### Reliability Technology Solutions

- Guest speaker: RS Future Road Map, Update on AMS Machine Works v1.8, MHM Software Road Map
- Guest speaker: Balancing of Steam Turbine using an AMS 2140

#### 12.30 Lunch

##### Afternoon session

- Wireless Vibration Monitoring Trials & Solutions
- Guest speaker:
  - AspenTech and MTell Present Enhance Asset Reliability and Performance
  - Monitoring Asset Performance and Enhancing Reliability through Prescriptive Maintenance Solutions

#### 16.00 Drinks & Networking session

*Hands-on workshops & demonstrations are running throughout the day.*

### AGENDA Day 2 (Cost \$750/person)

Course Name: AMS Machinery Manager Database Optimisation Workshop

### GUEST SPEAKERS

#### David Kapolnek, Emerson



David, Director of Product Management – Reliability Solutions, has over 16 years of experience with Emerson extending across multiple business disciplines leading in product development and marketing initiatives. In the past 4 years David has lead the product development team of Emerson's Reliability Solutions business.

#### Salah Attia, Reliability Consultant



Salah has Bachelor's Degree in Mechanical Engineering and is an Asset Reliability Specialist He is also an Instructor for Vibration Analysis (levels I, II, III & IV), Thermal Imaging Level I, and Advanced Turbomachinery Analysis.

#### Michel Bachoir, AspenTech



Michel, Principal Solutions Consultant, specialises in monitoring asset performance through prescriptive maintenance solutions. His expertise aims to enhance reliability, thereby helping to reduce maintenance and operation costs.



Scan QR code to register

RSVP by Friday 23rd August  
Please advise any dietary requirements

For any questions, please contact  
[Jacqui.vandermerwe@emerson.com](mailto:Jacqui.vandermerwe@emerson.com)



# South Australia and NT Branch Update

The South Australia and Northern Territory Branch recently held its AGM at the picturesque Adelaide Rowing Club, overlooking the River Torrens.

This fantastic venue seamlessly blends history, sport, and social functions. Founded in 1882, the club's rich history surrounded the AGM participants, creating an inspiring atmosphere. We were also treated to a lively performance by Luke Jones and Jordan Beinke, bringing vibrant energy back into the century-old building.

With the continued involvement and support of our members, this year we had over 60 attendees, including members, partners, guests and sponsors.

I would like to take this opportunity to thank all our sponsors for their support of the event, including our Gold Sponsors, Red Earth NDT, ARI, Evident and Kuzer Technical; and our Silver Sponsors QMS, Evosonic and NDE Solutions. It is fantastic that the sponsors recognise the importance of this event and its critical function for our sector of industry.

Further, I would like to thank the following individuals for their contributions ahead of, and during, the event:

- Craig Taylor for organising the venue, food and beverages
- Nick Ferguson for chasing down sponsorship and creating the flyer for the event
- Uma Sudhakar as the point of contact for AINDT, receiving and consolidating the RSVPs
- Luke and Jordan for setting up the sound equipment and entertaining those present

During the AGM, new office bearers were announced and the presidency was handed over to Tyson Jenke. Supporting Tyson for his term as President will be Luke Jones as Vice President, Hans Zuidland as Treasurer and Nick Hart as Secretary.

This year the South Australia and Northern Territory Branch presented two awards, both of which went to Morne Naicker. The awards were the Baker Hughes award for the Highest percentage pass mark in the AINDT Level 2 Radiography practical exam 2023; and the LMATS Pty Ltd award for the Highest percentage pass mark in the AINDT Level 2 Radiography (Overall Exam Results) 2023.

The evening closed with a word from the new President, before the all-important socialising commenced. It is always great to see old friends laughing together, new contacts created and networks expanded between members of the industry.

This promises to be an incredible year with plans for technical evenings already being discussed and ideas for the Christmas show sprouting.



WITH THANKS TO OUR GOLD SPONSORS

ARI Asset Reliability Inspections EVIDENT RedEarth

WITH THANKS TO OUR SILVER SPONSORS

evosonic Kuzer Technical NDE SOLUTIONS QMS NDT & NACE

# Victoria and Tasmania Branch Update

It was wonderful to see everyone at this year's Victoria and Tasmania Branch AGM on Friday 26 July at Frontside Food and Wine in Port Melbourne.

A special thank you goes to ATTAR, our gold sponsor, for the amazing high-tech drone door prize, and to Evident, our silver sponsor, for their essential support.

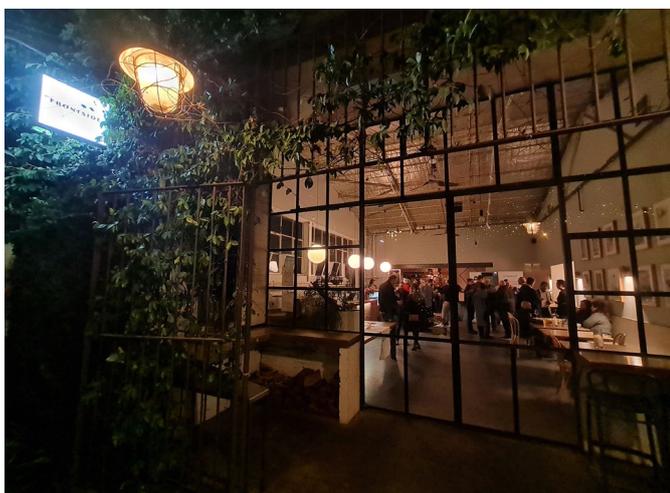
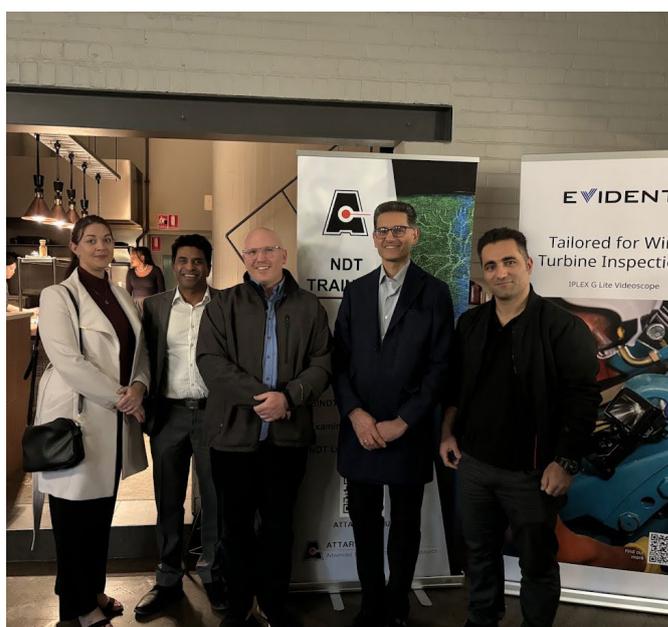
The Branch made significant progress this year. We ended with a positive Branch balance, which was better than anticipated. However, our financial membership has declined from 183 to 165. We are looking at developing strategies to enhance engagement and bring in new members.

Some of the highlights of the year include our 2023 AGM at the Esplanade Hotel and the Christmas Gathering at Collingwood Children's Farm. We also held a technical night on Practical Ultrasonic Corrosion Detection and provided a space for technicians to come along and practice their skills at the Branch Specimen Testing Night. These events provided a relaxed and enjoyable setting for members to connect and share knowledge.

Looking ahead, we are excited about our upcoming Technical Night on 20 September at the Golden Gate Hotel. This promises to be an informative and engaging evening, showcasing the latest in Eddy Current Array Systems by Eddify. We hope to see you there!

We'd like to introduce our new council for 2024–2025. Paul Trigg will continue as President, with Miro Katouzi as Vice President, Samad Asghary as Treasurer, Sadegh Abbaspour as Secretary, and councillors Pranay Wadyalkar, Glen Haberl, Peter Milligan, James Burton, and Shaina Johnson.

The past year demonstrated the commitment of the Victoria and Tasmania Branch to the NDT industry. With your continued support, we're confident that we'll continue to offer great events for our members.



WITH THANKS TO OUR SPONSORS

GOLD SPONSOR



SILVER SPONSOR



# Western Australia Branch Update

The AINDT Western Australia Branch AGM was held on the evening of Friday 2 August. The event was hosted at the impressive Lucky Shag venue at the Elizabeth Quay Waterfront.

There was a real buzz around the event with the 107 attendees consisting of a mixture of members, non-members, member companies and industry legends who all mingled, networked and enjoyed the fantastic food on offer throughout the evening.

As part of the formalities of the evening, Branch President Josh Wilkinson conducted a review of the activities over the year, and provided a Membership Report and Treasurer's Report. The Western Australia Branch also welcomed Mark Welland to the Council, while thanking Warren Villarosa who is leaving the Council after many years of outstanding service.

In addition to the Branch President's Report, the AINDT Federal CEO, Stuart Norman, over for the evening from Melbourne, spoke about the many Federal initiatives that have been implemented since he began his tenure with AINDT. This included an exciting revelation about upcoming initiatives around traineeships and apprenticeships.

As always, these events wouldn't happen without our generous sponsors, and we were delighted to welcome our Gold Sponsors, Rio Tinto, who ensured that the event was well catered for. Not only did they sponsor the event, but they also brought along a number of new faces to the AINDT event and helped make it a great evening.

Thanks also to Silver Sponsors Bureau Veritas, Evident and Applus; and Bronze Sponsors MDR Certification Engineers, PCTE, NDT Instruments Australia, and Goldfields NDT. The sponsors also generously donated prizes, with the winners detailed below.

**Rio Tinto:** Dhinakaran Ayyalusamy

**Applus:** Craig Davies

**Evident:** Alex Lichter

**Bureau Veritas:** Jason De Silveira

**MDR Certification Engineers:** Steven Teo

Thank you to all the attendees who made it a very enjoyable evening. We look forward to seeing you all next year. The event closed out a very positive year for the Western Australia Branch, while also looking ahead to a positive year of engagement with our members.



WITH THANKS TO OUR SPONSORS

GOLD SPONSOR



SILVER SPONSORS



BRONZE SPONSORS



# Standards Update

On 1 to 3 June, ISO Technical Committee 135 on non-destructive testing held meetings. Standards Australia MT007 delegates attended these meetings for the first time as new observer members on the NDT main, ultrasonic, radiography, eddy current committees.

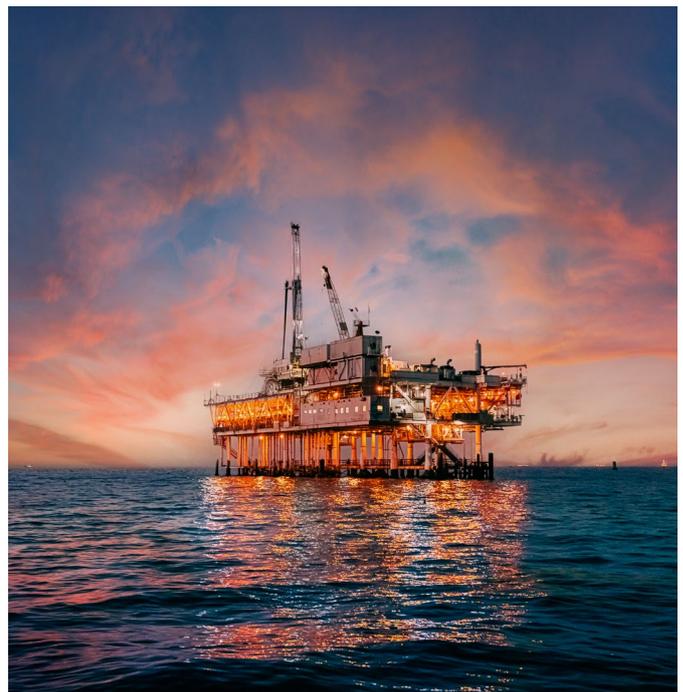
Our attendance was very well received by other country members. We continue as members on the ISO Committees covering NDT certification, thermography and acoustic emission.

Proposals are in place and it is expected that the MT007 ISO membership will expand before the end of this year. This will allow delegates to participate on all ISO Committees covering the full range of NDT fields including magnetic particle, penetrant and potentially a new magnetic flux leakage Committee.

Meetings were well attended with most countries involved and large delegations from the US, China and Germany. Eye specialists were invited to present on the visual acuity standard. It is expected that some revisions will be made within the Standard based on the specialists' recommendations. These recommended changes are being considered and seen as being an easier approach allowing a number of eye check methods to be chosen from to establish visual acuity.

Meetings were held over three days with reviewing and voting conducted. In addition, working groups either reported or organised discussions covering the following NDT fields and Standards:

- TC135 / SC3 Ultrasonic testing – Vocabulary
- TC135 / SC3 Ultrasonic testing – General principles
- TC135 / SC3 Ultrasonic testing – Specification for standard block No 1
- TC135 / SC4 Eddy Current testing – Vocabulary
- TC135 / SC4 Eddy Current testing – Magnetic flux leakage (new committee being proposed)
- TC135 / SC7 Certification – Visual Acuity
- TC135 / SC7 Certification – Discontinuities in specimens for use in qualification examinations
- TC135 / SC7 Certification – Guidelines for NDT personnel training and organisations
- TC135 / SC7 Certification – NDT training syllabi's
- TC135 / SC8 Thermographic testing – Mechanical and electrical equipment testing
- TC135 / SC9 Acoustic Emission – Vocabulary
- TC135 / SC9 Acoustic Emission – Detection of corrosion and leaks in storage tank floors



A number of acoustic emission working groups were disbanded due to the work being completed and Standards being adopted.

No details were available for the recent ISO meetings held on magnetic particle and penetrant testing; Standards Australia is awaiting membership proposals to be accepted on these ISO Standards Committees.

Meetings for Standards Australia MT007 Committee Members are scheduled for August. It is during these meetings that many of the ISO Standards will be reviewed and possibly voted upon. As a reminder, if any Standards are voted upon and accepted, the draft version will be made available for public voting. Please review these drafts and provide comments if you believe a change is necessary.

Please contact me using the details below if you have any questions or require further information. I will reply at the first opportunity.

**Angelo Zaccari**  
**MT007 Standards Chairperson**  
 azaccari@aben-tech.com.au

# Thermography in Action

## Electrical Thermal Case Study

IIAT was commissioned to conduct thermal surveys on the electrical motor control centres (MCCs) at a client's mine site in Queensland. The purpose of the project was to mitigate the risk of unplanned breakdowns.

During the inspection, several thermal anomalies were identified, with the most critical anomaly detected on the Red Phase on the load side of the contactors and the overload circuit of the plant feed conveyor.

The plant feed conveyor system is the main conveyor that transports all product into the processing plant. A shutdown of this system would halt the entire plant's production, resulting in losses of hundreds of thousands of dollars per hour.

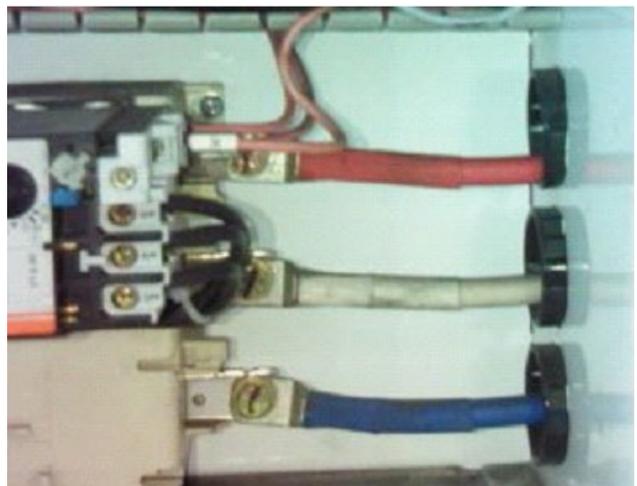


Digital image of the load side of contactor red phase.



Thermal image of the load side of contactor red phase.

Similarly, in the digital image of overload circuit red phase, there were no visible defects to the naked eye. However, the thermal image identified anomalies, exhibiting a resistance thermal pattern.

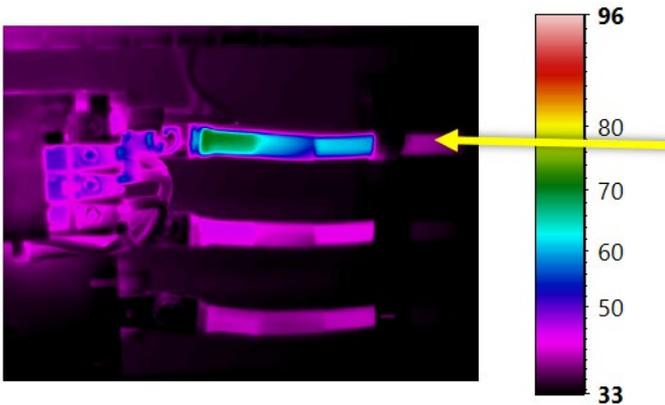


Digital image of overload circuit red phase.



### Thermal Survey Results

As shown in the digital image (below), no visible defects were evident on the load side of the contactor or the overload circuit. However, the infrared images identified thermal anomalies. The load side of contactor exhibited a resistance thermal pattern and a high operating temperature



Thermal image of overload circuit red phase.

### Remediation Action

Once IIAT had completed the survey and submitted a detailed report explaining the findings, the maintenance team immediately executed the removal and inspection of the contactor.

When the contactor cover lid was removed, it became evident that the internal connections were oxidised, as illustrated in the following images. This oxidation caused increased resistance, detectable only via a thermal camera and not visible to the naked eye.



Internal view of the contractor box red phase showing load side of contactor with damaged contactor points.

### Results

After the removal and replacement of the internal contactors, a follow up survey was carried out. The plant was run under normal operating conditions before the component was re-imaged to ensure the effectiveness of the repair.

No thermal anomalies were found during the follow up survey.



Digital image of the contactor and overload circuit with no visible defects evident.



Thermal image of the contactor and overload circuit with no thermal anomalies evident.

### Conclusion

All thermal surveys were conducted under normal operating conditions, ensuring no disruption to the normal operation of the plant. In fact, maintaining normal operations is essential for obtaining the most accurate results. Every thermal anomaly identified was promptly investigated and rectified. This proactive approach prevented extensive downtime, production losses, and potential damage to other components, significantly reducing the risk of future failures.

# AICIP Update

## Enrolments have opened for the September 2024 AICIP examinations.

Recognised nationally, AICIP certification can expand your career options and job opportunities. Examinations assess the level of skill, knowledge and capability of

professionals working in the pressure equipment sector to ensure the integrity and safety of plant and pressure equipment inspection.

### Dates and fees

Exam Papers	National Locations	Dates (September)	Time
Exam Enrolment Deadline	Nationally**	16th Aug 2024	No Enrolments after this date <a href="#">APPLY HERE.</a>
Exam Onboarding Deadline	Nationally**	11th Sep 2024	No Onboarding on day of exam
ISI paper A & B – Theory	Nationally**	12th Sep 2024	AM – PM
ISI paper E – Practical*	Nationally**	13th Sep 2024	AM
SISI Paper C & D – Theory	Nationally**	13th Sep 2024	AM – PM

Additional dates for the exams may be added/deleted depending upon the applicant interest.

\*\* Nationally – Sydney, Adelaide, Brisbane, Melbourne, Perth and \*Darwin.

\* Darwin applicants, please note, for the exams to run, there needs to be a minimum amount of enrolments, therefore candidates may need to opt for a different region to sit their exams. Candidates will be notified accordingly.

In-Service Inspector (ISI) –  
Pressure Equipment : Sit Papers  
A, B & E

**\$885.00**

Senior In-Service Inspector  
(SISI) – Pressure Equipment : Sit  
Papers C & D

**\$495.00**

### Suggested Prior Attributes Of Candidates

There are no prerequisites, prior qualifications, training or experience required for ACIP in-service inspectors' examinations. However, candidates with insufficient industry experience will have difficulty passing the theoretical Paper B and practical Paper E.

To have a reasonable likelihood of demonstrating the required competency and passing the exams, it is strongly recommended that applicants have at least the following:

- Qualifications:
  - Year 12 High School, a trade certificate or equivalent knowledge.
  - Knowledge of common pressure equipment types and terminology used in Australian Standards.
  - Basic mathematics ability (for example, to calculate the volume, thickness and hoop stress of a cylinder).
- Training: 100 hours of either self or on-job training in pressure equipment inspection and the application of AS/NZ 3788.

- Experience: five years (full time equivalent) including two years in inspection. Experience should be sufficient to develop basic technical skills and good communication skills.
- Pressure equipment knowledge: an understanding of the main technical inspection terms relating to pressure equipment.
- Personal skills:
  - Ability to read, write and communicate orally in English.
  - Maturity and reliability.
  - Good eyesight and hearing (with or without correction).

For SISI applicants, more in-depth experience, calculation and technical ability is desirable.

To enrol in an AICIP examination, visit:  
[inspectors.aicip.org.au](https://inspectors.aicip.org.au)

# Member Profile: Mark Welland, Technical Director, IRISNDT

With over 25 years' non-destructive testing (NDT) experience, Mark Welland has worked across a diverse range of sectors including fossil fuel power generation, petrochemical refinement and oil and gas.



Mark Welland, Technical Director, IRISNDT

Mark is currently a Technical Director at IRISNDT, a leading firm that provides NDT solutions to the chemical and petrochemical, refining, renewables, power, mining and other diverse end markets in Australia, the US, Canada, the UK. Prior to this, Mark led the training and NDT department at ATTAR. He is qualified to globally recognised AINDT level 3 in six NDT methods and holds a Bachelor of Science NDT (Hons).

## Where do you work? Describe your job.

I have recently joined IRISNDT as a Technical Director based in Perth, Western Australia. My role is threefold including technical compliance within NDT, internal training in NDT, and consulting in NDT.

Can you share your journey into the NDT industry? What motivated you to take on a career in NDT?

My journey started early, when I was about six years old I seem to recall. My father, Nicholas Welland, worked in the NDT department of the Williamstown Shipyard. He would occasionally bring home UT sets and calibration blocks where I would be invited play and learn over the weekends.

I remember chasing and being chased by my brother Timothy around the shipyard exposure bay with the Isotope retrieval tongs on shipyard open days multiple times over the years. So it seemed natural that during the holidays before the start of my final year at high school, my father arranged a holiday job for me at ETRS in West Footscray. An NDT Technicians Assistant, I worked there from mid-November until the end of January.

What I experienced and learnt in that short time convinced me that I wanted to be an NDT technician. The science of it all; the thrill of applying white background well for the MT technician, passing boxes correctly through a real time x-ray unit, all played a part.

I spent the next 12 months completing the final year of high school as well as traveling into RMIT in Melbourne by train. By cutting some afternoons off from high school (two a week) I was able to study under John Rodda in his NDT classes. At the end of the year, I had completed year 12, as well as classes and theory examinations in MT, PT, UT, RT, and a radiation safety course.

Two days after my last exam in high school I started full-time employment as a junior technician for INTICO in Coburg. Over the following two years or so I had gained the experience hours and practical examination passes to apply for my NDT certifications. From the start I just enjoyed every second of it.

## Who or what has influenced you most professionally?

I have been very fortunate in my career to meet and work with many of the country's most experienced and knowledgeable NDT minds. The person who I could say has influenced me the most is my father.

Nicholas Welland was—and continues to be—a source of great inspiration to me. I still find myself asking, how would Dad approach this? What would Dad say in this situation?

**Nick is a man of great knowledge across a multitude of topics, irreproachable morals, and patience measured in the geological scale for those that want to listen and learn. Thank you Dad.**



**What has been the most interesting project you've worked on and why?**

I have had the privilege to work on some amazing projects and jobs over the years. There is one that comes to mind that was certainly very interesting: working on development, construction and commissioning of a Wheel Qualifying Machine (WQM) for rail wheel sets with Paul Grosser (of ATTAR at the time), and Keith Arcus (representing the client at the time).

In the one footprint a machine was made such that a single button push from the operator could it take in a rail wheel set in "off-track" condition with little to no cleaning, sense the wheel set ID and current wheel diameters and run a setup file for a PAUT inspection. During the set-up file calculation time perform a residual stress measurement by acoustic birefringence with polarised 0-degree shear waves from E-mat transducers, then when ready perform the PAUT scans on the wheels (immersion testing using shear and longitudinal wave mode tests). When the scan was complete, it could perform analysis of its own collected data, and issue a grading against the client's acceptance criteria for a result. This to my knowledge, at the time, was a world first.

**What advice would you give to someone just starting their career in the NDT industry?**

To quote a great man, "NDT is not for everyone". However, if you find out it is for you, then persist. NDT is an incredibly rewarding career, but it does take time to get proficient. I've been doing this for coming on 26 years now and I still learn every single day.

One of benefits in NDT is you can make it what you want to some degree. It can be as white collar or as blue collar as you want. NDT is everywhere. The safe operation of our society relies upon it—daily. It's in workshops, in aircraft hangers, in shipyards across the county. In remote mine sites above ground and underground, in oil refineries and chemical plants, onshore, offshore and sub-sea, in power generation, research labs, NDT equipment sales, the list really is endless.

The choice is up to the individual in terms of what they want out of a life in NDT. Trust me, NDT has it all for those suited to it.

**What has been your greatest professional achievement?**

To date, I would say leading the training and NDT department at ATTAR in recent years. Being part of the education of the future generations of NDT technicians is important to me. I learnt from some of the best that took the time to help me – we really need to pass it on.

**How has being a member of AINDT benefited you professionally or personally?**

The AINDT has been part of my life as far back as I can remember. I have fond memories of AINDT Victoria Branch Christmas parties. These were always highlights growing up in the 80s and 90s.

Since becoming a member for myself in 1998, I regularly attend the social events and technical nights where I can. I like getting to meet like-minded people within the NDT community, and catch up with friends and colleagues from other companies.

Getting the AINDT journal, now called Industrial Eye, gives me hours of reading on new and exciting developments within NDT, not only in Australia but across the world. Being a member I have the chance to become Branch councillor. Being an active member of the Institute has helped me give back to the industry that has given me a career.

It also helps me with renewing and recertification for my AINDT certifications! AINDT Guide to Qualification and Certification, 3.19.5 Structured Credit System – Table C1, Item 8, that's five points right there!

**What are the top three things on your bucket list?**

1. Spend more time with family where possible.
2. Be comfortable with my lot in life.
3. Travel more of the world.

## Rapid Fire

### What is your favourite:

- Food: Three-way tie in no particular order, kimchi jjigae, full English breakfast and Kris's smoked brisket
- Song: Ture Blue, John Williamson
- Sport: Motorsport

### If you could be famous, what would it be for?

I would want to have invented a new technique or method of NDT that is useful.

### If you could meet anyone—alive or dead—who would it be?

Siddhartha Gautama

### What is your pet peeve?

Technicians not filling in worksheets correctly or completely.

### What is your top tip for NDT excellence?

**Inspect carefully, measure accurately and follow the procedure. Always ask yourself, would I be comfortable having this work or decision on the evening TV news or delivered in a Coroner's Court.**

The answer should always be 'Yes'.

Yes, I am comfortable, because I inspected carefully, I measured accurately, and I followed the procedure.



# Innovation and Expansion: ATTAR's Strategic Growth in NDT and Beyond

Founded in 1986, Advanced Technology Testing and Research (ATTAR) was established to conduct materials testing and research using the most advanced techniques available and to provide non-destructive testing (NDT) training to the Australian industry. Industrial Eye chatted with ATTAR's General Manager of Training and NDT, Tom Hunt, about ATTAR's capabilities, technological advancements, and broader industry challenges and opportunities.

From its facilities in Melbourne, Perth and Brisbane, ATTAR provides forensic engineering, materials, mechanical and electrical failure analysis, fire investigations, materials and mechanical testing, expert witness services, compliance testing, condition monitoring, non-destructive testing training, examination and consultancy services and professional writing training.

According to Tom Hunt (General Manager of Training and NDT, ATTAR), "Gary Martin and Don McConville founded ATTAR in 1986 off the back of a new contract with Sydney Council. There was a real demand for material analysis in Australia at the time, and not a lot of companies providing the service. By 1990, ATTAR had started to delve into non-destructive testing. Today, NDT services represent the largest part of the company."

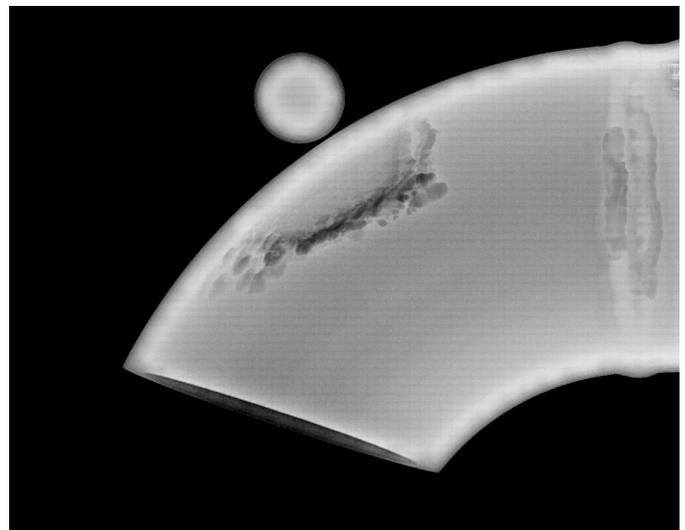
**"Over the next 15 years, ATTAR expanded, working nationally from its head office in Melbourne, as well as internationally in Kuwait, Fiji, New Zealand and Indonesia with the International Atomic Energy Agency."**

"In 2008, we opened in Western Australia, offering NDT training full-time. In the last couple of years, especially post-COVID, ATTAR has expanded even further, strengthening its services to include fire investigations, moisture testing and even NDT services for the aerospace industry," said Tom.

## Extensive Expertise

ATTAR's expertise now encompasses an expansive array of NDT methods, failure analysis and forensic engineering, risk assessment services, specialist testing of structures and vessels, and the provision of expert witness services.

ATTAR's Level 3 personnel can help with a range of services, including preparation of quality manuals, inspection procedures, selection and assessment of specialised NDT methods, assistance with audits and more.



CRDR PR Corr.

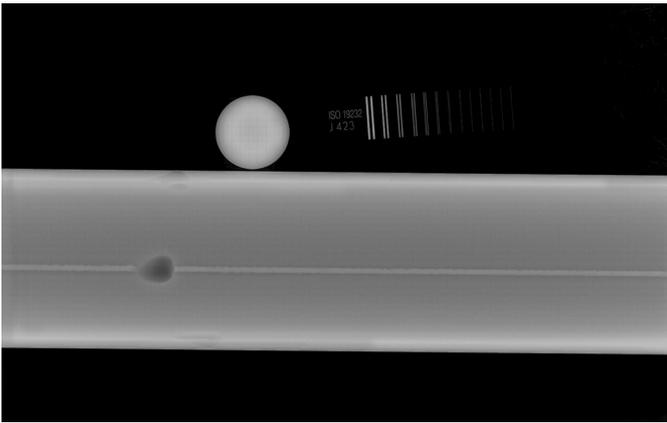
ATTAR provides specialist condition monitoring services and testing of assets within mining, oil and gas, petrochemical, and energy with a focus within this sector on transmission and distribution.

ATTAR's Consulting department collaborates with a broad range of sectors across Australia, including food manufacturing, insurance, legal, utilities, mining, oil and gas, government and defence. With deep expertise in forensic engineering and material investigation, ATTAR stands at the forefront of these fields, frequently serving as an expert witness in cases, including those presented before the High Court of Australia.

As Australia's largest Authorised Qualifying Body (AQB), ATTAR provides expert NDT training, including the provision of private and customised courses, as well as consulting, auditing and specialised Level 3 services.

## Technological Advancements

The biggest advancement that I've seen in recent years is the introduction of digital technology in radiography. The move from traditional wet film radiography to advanced digital panels is perhaps the most significant



CRDR PR Tang



ET Training Welshpool.

advancement in recent years. These digital panels offer more focused imaging capabilities with enhanced grayscale contrast, allowing for precise differentiation of material thicknesses and detailed detection of flaws.”

**“This evolution not only increases the accuracy and efficiency of analyses but also significantly cuts down on inspection times. Moreover, the shift away from lead-based films to digital solutions underscores a commitment to environmental sustainability, reducing waste and eliminating the need for harmful chemicals used in film processing.”**

Although the initial costs of adopting digital technology can be high, the long-term benefits—improved accuracy, reduced environmental impact, and enhanced efficiency—underscore the value of this investment in the evolving landscape of NDT. It’s because of all these benefits that ATTAR has integrated this technological advancement into its services.



UT Testing.

“When our forensic engineers assess failures, they use digital radiography. For example, we recently had a charging cable and wanted to identify the differences in quality. We were able to do this using digital radiography. We also provide training in the use of this NDT technique as well. Ken Williamson—one of our trainers—is one of Australia’s leading experts in radiography. With his expertise, ATTAR has been able to integrate digital radiography into our training,” said Tom.

### Opportunities and Challenges

“I think the biggest opportunity for the NDT industry in Australia is the slow but eventual transition from fossil fuels into renewable energies. At some point, when the renewable energy projects come to fruition—the construction of solar farms and wind turbines, even potentially nuclear—NDT will be really important to these industries.”

**“The growing importance of AI will also present a range of opportunities for the NDT industry. When it does, the demand for technicians with skills and knowledge in the application of AI will really grow. The industry will need people who understand NDT to teach and program AI. AI will play a big part moving forward.”**

Despite these opportunities, some persistent challenges also remain, particularly a shortage of skilled personnel.

“Keeping people in the NDT is one of the challenges for the industry. When you meet people who work in NDT, they have usually grown up with some exposure to the

industry. Their father or uncle or someone they know has worked in the industry. As a career path, the reach of NDT is really narrow. You don't often hear about NDT as a career unless you're already close to the industry," said Tom.

"It can be equally difficult keeping people in the industry. NDT is not always an easy career—you can end up working in the mines or in hot and dirty environments. There is a big age gap in the industry. There

are a lot of people in their 40s and 50s, but not many in their 20s. We need more technicians—everyone is screaming for them."

Given this skills shortage, Tom had some great advice for NDT technicians looking to advance their careers in the rapidly evolving field.

"Don't stop learning and asking questions. There are new NDT variations being found all the time. Standards don't change very often, but the techniques for testing do.

For example, we've found there is a gap in knowledge for radiography technicians. We teach one technique, but everyone performs different techniques in the field."

**"Also, get involved in the industry. People might be AINDT members, but they don't go to events. Keep turning up to webinars, workshops and other events. Meet people in the industry. Network, and learn from one another,"** said Tom.

**A Bright Future**

Earlier this year, ATTAR boosted its investment in Western Australia with the unveiling of new world-class facilities. This commitment is designed to optimise their operations, deliver cutting-edge solutions and elevate service standards for ATTAR clients.

According to Glenn D'Costa (CEO, ATTAR), "Western Australia is an important market with a unique blend of mining, oil and gas as well as other industries that are essential to running the state. By consolidating our presence and increasing our investment in Western Australia, we are better placed to support the needs of our clients and the critical industries that drive this great state."

ATTAR now has its sights set on the Queensland market. "We're looking at introducing a much broader suite of NDT training in Queensland. By the start of next year, we will have a trainer based in Queensland full-time to help meet the local demand," said Tom. "We're also focused on growing and getting involved more with companies internationally."

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# Vibration Analysis of Fluid-film Bearing Machines – an Introduction

Typically, many begin their vibration analysis career surveying and analysing equipment with rolling element bearings. In some industries, they may encounter little else in their daily work, though most sites will have at least a few fluid-film bearing machines. Some may have many.

BY CHRIS WHITE, TECHNICAL AUTHORITY, WOOD PLC

The generally accepted minimum standard for a condition monitoring engineer or technician to work unsupervised is Vibration Category 2 (VCAT2) per the ISO 18436 standard. Unfortunately, the VCAT2 curriculum affords only a very light treatment of fluid-film bearing machine analysis. The VCAT3 syllabus provides a rather deeper understanding of this (and several other topics).

This may seem to imply that fluid-film bearing vibration analysis is very much more complex, and it certainly can be. However, in the main, it just requires a rather different approach, and whilst certainly no substitute for a formal VCAT3 course, this article offers a little guidance on the most common errors made by those new to fluid-film bearing analysis – who, rather than missing faults, more often tend to see faults where none exist – false positives.

## Measurement – a Brief Review

‘Fluid-film bearing’ is an umbrella term for any bearing type that relies on a fluid film to maintain separation between the rotating shaft journal and the static bearing. This includes plain journal or shell bearings, and lobed and tilting pad bearings, to name just a few.

The ideal and most common way to capture vibration from machines of this type is to directly measure the movement of the shaft relative to the bearing housing, using non-contacting relative displacement probes (aka proximity probes) employing eddy-current technology. Typically, there are two radial probes at each bearing location, mounted at 90° to each other to capture movement in two dimensions. The ideal would be to mount probes on the machine's true horizontal and vertical planes, but because the bearing housing split is often horizontal, this is not usually possible. Thus, the probes must often be rotated from the ideal. There are many configurations, but a common arrangement is to install the probes at 45° on either side of the vertical (Figure 1).

There is a very important convention here; whilst probes are rarely installed in the truly vertical or horizontal plane, the correct orientation of X and Y probes is nevertheless important to avoid misdiagnosis of certain issues. The convention is as follows: if looking from the driver toward the driven component, the X probe is always 90° clockwise from the Y probe, regardless of probe orientation or direction of shaft rotation. Unfortunately, our experience across many sites is that

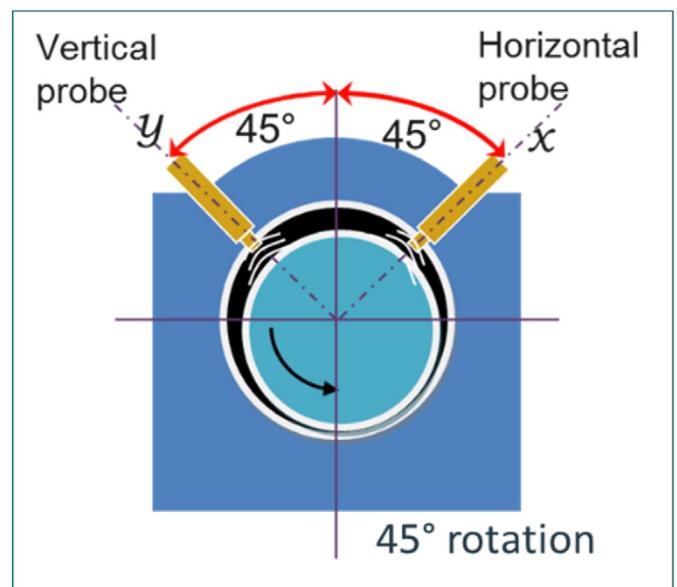


Figure 1.

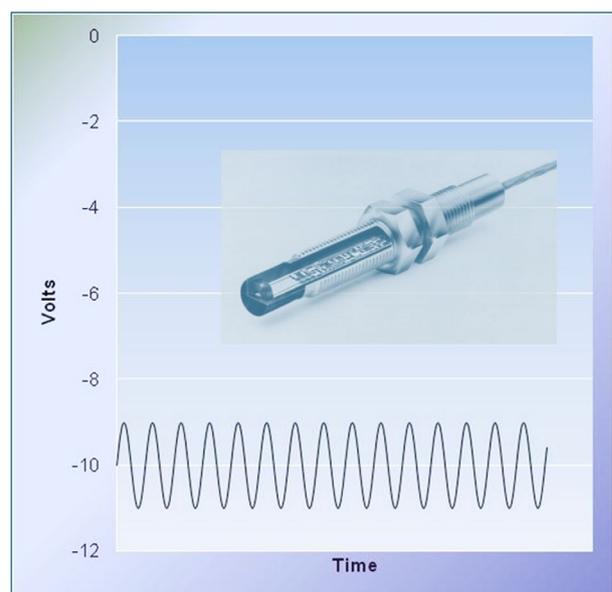


Figure 2.

the probes are very often incorrectly connected, i.e., swapped.

The output signal from a displacement probe channel comprises two important components (Figure 2):

- An AC component – the dynamic part of the signal, representing the shaft movement around its average running position, i.e., its vibration; and,
- This is superimposed on a negative DC level or gap voltage (nominally -10v DC) – representing the average gap between the probe tip and the shaft.

The gap voltage enables us to monitor the mean shaft running position within the bearing.

The same type of probe is commonly used to provide a once-per-revolution pulse for use as a phase timing reference; this is referred to as a key phasor. This is achieved by installing a single probe, again in a radial direction, but in a location where it will 'see' the key or keyway passing, or, in the absence of such, a very shallow hole may be drilled on the shaft surface.

Finally, the same probe type may also be used in an axial orientation to detect significant changes in shaft thrust position – a thrust probe – but in this case, we are interested only in the DC component of the signal.

### Basis for Diagnosis

Much of the vibration analysis in fluid-film (FF) bearing applications is not necessarily more difficult than with rolling element (RE) bearing applications – it's just different, in four major ways:

1. In RE bearing applications, single-channel measurements are generally sufficient for our needs. However, in FF bearing applications, simultaneous dual channel measurements are essential to diagnose some issues.
2. In RE bearing applications, we often only require steady-state data for effective monitoring and diagnosis. However, many problems in FF bearing applications cannot be diagnosed without transient data – steady-state data does not give the full picture.
3. In RE bearing applications, the major focus of analysis is on the spectrum, with some useful further information coming from the waveform. But in FF bearing applications, the spectrum, whilst remaining useful, provides far less insight and we rely upon a much wider range of steady-state and transient plots, including orbits, Bode/polar plots, and shaft centerline (SCL) plots.
4. In RE bearing applications, phase information is not routinely acquired, though it may be acquired for troubleshooting. But in FF bearing applications, phase data is an important part of our routine monitoring, provided by a continuously monitored key phasor channel.

Well-appointed monitoring systems will continuously capture the data we need and archive it for later analysis. If the necessary software and server are not installed and configured to archive data, the best we can do is connect external multi-channel acquisition equipment and acquire data. Hopefully, operations will be amenable to arranging a coastdown and run-up of the equipment, so that we can acquire some invaluable transient data also.

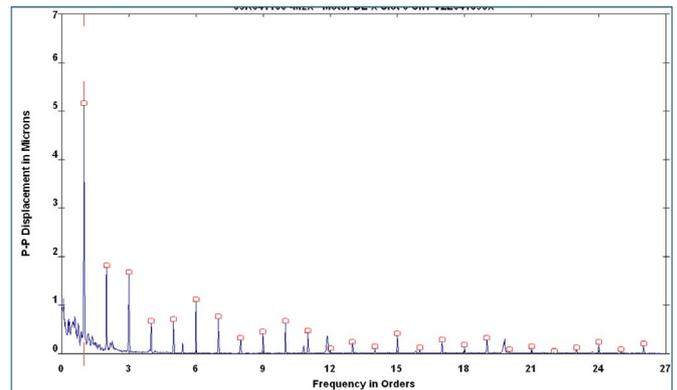


Figure 3.

### Assessing Vibration Amplitudes

Until recently, the most commonly referenced standards addressing the 'how much is too much' question were the multi-part ISO standards 7919 and 10816, focussing on shaft and casing measurements respectively. However, they are being superseded by the ISO 20816 series of standards, which will provide assessment recommendations for both shaft and casing measurements. At the time of writing, most of the expected parts have already been published.

Whilst casing velocity measurements have the same severity implications almost regardless of frequency content, this is not true of shaft displacement, where the higher the dominant frequency, the more significant the implications of a given amplitude. In ISO 7919 and the relevant parts of ISO 20816, therefore, recommended limits can be calculated (in units of microns peak-peak /  $\mu\text{m pp}$ ) using the provided formulae which incorporate a turning speed weighting – this of course assumes turning speed frequency is dominant in the data. These formulae, then, yield absolute values for recommended vibration limits for a given speed regardless of machine size; but this is not the only way to assess amplitudes.

An alternative approach is to divide the measured peak-peak displacement amplitude by the bearing clearance and thus determine the percentage of the clearance that the vibration represents. This can make more sense for very large or very small shaft sizes since clearances are generally proportional to shaft diameter (approximately 1/1000 of the diameter). A vibration amplitude of less than 20% of clearance might be considered normal, over 40% of significant concern, and over 60% high enough to mandate a shutdown.

### Understanding Spectral Data

A common error for those new to fluid-film application analysis is to observe many harmonics of turning speed in the spectra (Figure 3) and conclude that this indicates a looseness problem. This is understandable; in rolling element applications, this typically does indicate looseness and/or impacting.

But in fluid-film bearing applications, clearances are an order of magnitude greater – it could be argued that looseness is inherent in such applications. In more technical terms, harmonics of turning speed are

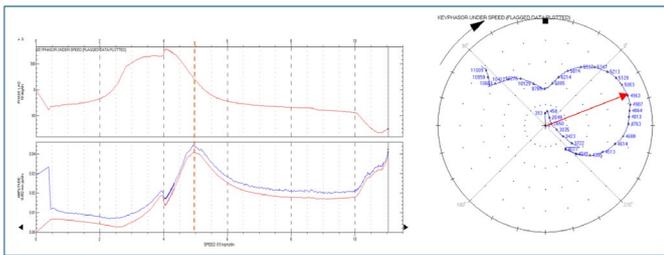


Figure 4.

associated with non-linear stiffness, and in a fluid-film bearing, bearing stiffness becomes progressively greater, the closer the shaft is to the bearing wall. Turning speed harmonics may also be prevalent in spectra due to scratches or imperfections on the probe target surface (discussed in more detail below).

Given that bearing wear is most likely to occur at the bottom of the clearance, a far better guide to wear or increasing clearances is to compare the probe gap voltages when shut down. When a unit is offline, we can note the gap voltages at the end of the coastdown (hot) and compare them with those at the end of previous coastdowns. Alternatively, we can compare current gap voltages just before start up (cold) with previous similar conditions.

### Bode and Polar Plots

Bode and polar plots are just two different ways of presenting the same information – plotting turning speed vibration amplitude and phase versus speed. The Bode (Figure 4, left) presents this as two separate plots, phase vs. speed and below it, vibration amplitude vs. speed. The polar plot (Figure 4, right) presents this in a single radial plot, where the distance from the origin represents amplitude, and the angular position represents the phase. Numerous data points are overlaid with the speed at that point.

The main purpose of either plot is to indicate critical speed(s) – speeds at which the shaft passes through a lateral natural mode or resonance. In the Bode plot, such a speed is indicated where the amplitude passes through a local maximum, and the phase lag increases by 90° from the phase at lower speeds. In the polar plot, it is indicated by the speed at the outer limit of a loop.

Equipment documentation usually includes information on expected critical speeds, and we can compare Bode or polar plots with the predicted values. Better still, we can compare current plots with previous transients over time to identify changes. A reduction in critical speed can indicate reduced shaft/bearing system stiffness, which could arise from increased bearing clearances or even shaft cracks developing. Conversely, an increase in critical speed over time can indicate increased stiffness

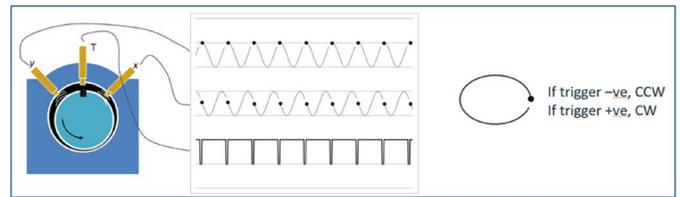


Figure 5.

of the system, for example, due to rubs, misalignment preload, or a build-up of oil varnish on bearing surfaces.

Whilst we are here, please note that determination of phase becomes very unreliable at low vibration amplitudes, particularly below 5 µm pp. Fresh analysts often see wild variations in phase at 2–4 µm pp and ask, “What does it mean?”. The short answer is, it doesn’t mean anything!

### Orbits and Direction of Rotation

Whilst we can view individual X and Y waveforms, a more intuitive way to use them is to combine them to produce the orbit plot. Moment by moment, the instantaneous X and Y values define the X and Y coordinates of the shaft centre and can thus be used to create a two-dimensional plot of the shaft centreline movement around its average position – this we call the orbit.

The once-per-rev impulse from the key phasor is incorporated to overlay a blank-dot sequence reminiscent of the days of oscilloscopes – this sequence marks the moment in the orbit where the key phasor pulse occurs. Observing where the dot occurs in the cycle, but also the number of dots in a display can be powerful aids to diagnosis.

Meanwhile, the direction of the blank-dot sequence can indicate the direction of rotation (DOR). The plots in Figure 5 indicate ‘X to Y’ or counter-clockwise rotation – the X probe waveform peaks 90° before the Y, and with a negative-going key phasor pulse (trigger), the blank-dot sequence goes in a counter-clockwise direction. Systems with a positive pulse from the key phasor (a key rather than a keyway) are rare – but produce a dot-blank sequence instead.

So, what if the data suggests that the rotation is opposite to that indicated by the equipment datasheet? It could be genuine – some equipment faults, such as a significant rub of some part of the rotating assembly on a static component can produce reverse precession, an orbital path opposite in direction to DOR. But it is more likely that the probes are wired incorrectly, i.e., swapped.

The only way to be sure, however, is to review orbital data at slow roll speed, preferably from a coastdown of the machine. The concept of slow roll speed is that it

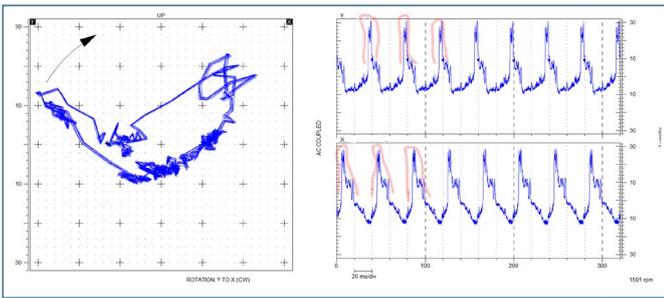


Figure 6.

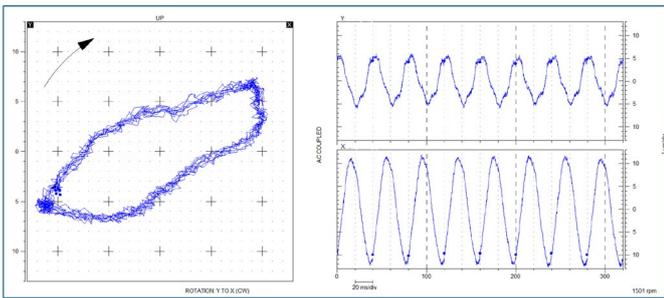


Figure 7.

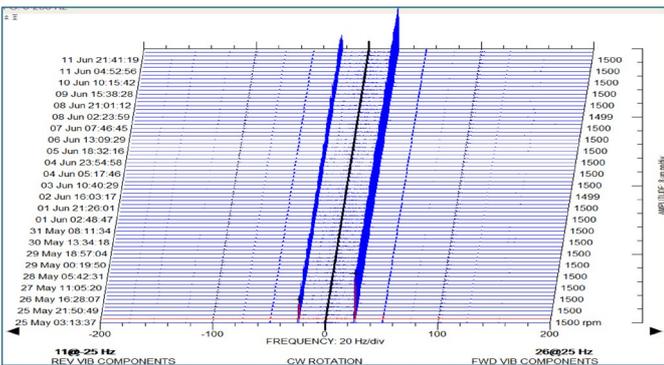


Figure 8.

is a speed below that at which excitation forces such as unbalance and misalignment become insignificant, and the probes are only showing runout of the probe track. A good value to choose is around 250–300 RPM, but also check in the Bode plot that amplitude and phase are relatively stable at that point. Genuine reverse precession is exceptionally unlikely at slow roll speeds.

**Runout**

The quality of data we obtain from our displacement probes is crucially dependent not only on the quality and condition of our sensors and their set-up, but also on the condition of that portion of the shaft that is their target – the probe track. As a perspective, note that the thickness of the average human hair is around 90 microns, and here we are talking about where significant issues can become apparent at less than half of that value.

This means that for our data to be of value, we need the probe track to have a very high standard of roundness, surface finish, and concentricity with the shaft journal. And, as the probes are using eddy current technology, it isn't just about the surface condition but also, the grain structure of the material below the surface needs to be very homogeneous (uniform) and not be magnetised by machining processes or machine function (such as might develop in a generator!).

All these considerations mean that we need to be very aware of the causes and effects of runout, both mechanical and magnetic. We may use the orbit shape to help diagnose certain issues – but the effects of some types of runout can severely prejudice those conclusions!

For example, the orbit plot for a generator bearing in Figure 6 might be considered to have a shape suggesting some form of constraint, possibly even a rub of some kind. But close examination of the associated waveforms shows this shape may be affected by some form of scratch or abrasive damage to the probe track (enclosed in the red markup), presenting to the Y and then the X probe in each rotation. Examination of the orbit at slow roll speed indicated that this was indeed the case, and the software employed here allows us to apply slow roll compensation to the data using vector subtraction (Figure 7).

There was, in fact, no issue present.

**Full spectrum**

The spectrum we obtain from a single sensor in our casing measurements might be more properly referred to as the half spectrum. For our two-channel displacement probe measurements, we can alternatively review what is referred to as the full spectrum. In simple terms, the spectrum (or half spectrum) is the single-channel spectrum of a waveform, but the full spectrum is the two-channel spectrum of an orbit.

The full spectrum has two halves: positive on the right, and negative on the left. Figure 8 presents many full spectra as waterfall plot, which allows us to see changes over time. The right-hand side represents that part of the orbit where the shaft centre is travelling in the same direction as the direction of rotation, forward precession. The left-hand side represents that part of the orbit where the shaft centre moves counter to DOR – negative precession.

Only if the orbit were perfectly round would we see the negative side displaying no peaks whatever – it does not signify an issue to see some negative components. However, the positive components should normally dominate. If they do not, this means that either there is a significant degree of reverse precession, which can sometimes indicate a problem – or again, perhaps the probes are incorrectly connected! As noted earlier, reviewing the same data at slow roll is key.

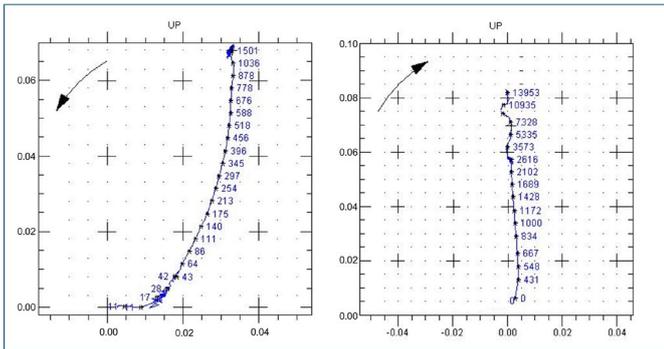


Figure 9.

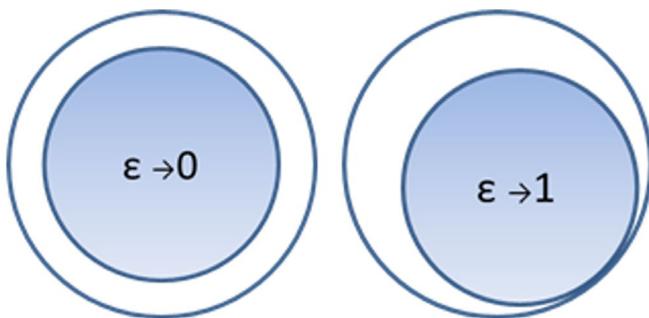


Figure 10.

### Preload and the Shaft Centreline Plot

At VCAT levels 1 and 2, we are taught that offset misalignment will result in a significant twice-turning speed peak in the spectrum, whilst angular misalignment will produce an elevated turning speed vibration in the axial plane. This is, however, a far less reliable indicator of misalignment for fluid-film bearing applications, because the mechanism which produces the 2x vibration is dependent on tight bearing clearances ... which is not the case in a fluid-film bearing!

Instead, we rely more upon the shaft centreline (SCL) plot to identify misalignment preload.

We saw how we can use the AC components of the X and Y probes, moment by moment, to provide the instantaneous X and Y coordinates of the shaft relative to the average shaft position and allow us to construct the orbit. Similarly, the DC component of those signals tells us what that average position is, relative to the probes. Even better, however, is if we combine and use them to tell us the average position of the shaft relative to the bottom of the bearing clearance. This is the shaft centreline plot.

The SCL plot uses the X and Y gap voltage data from a run-up or coastdown to show how the shaft moves from zero RPM up to normal speed, or from normal speed to the stopped condition. We do have to assume that the shaft will sit centrally in the bottom of the clearance in the stopped state (this is usually the case, though in just

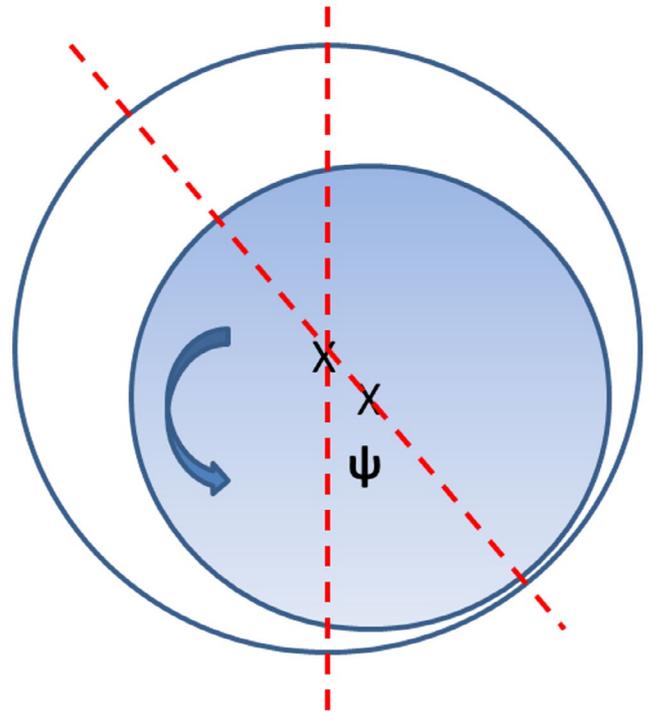


Figure 11.

a few applications it may not be so). The SCL plot origin is typically zeroed to the zero RPM state for both start up and coastdown data sets.

The plot in Figure 9 (left) is for a plain shell bearing; due to the counterclockwise rotation in this example, the oil ‘wedge’ forms towards the left and thus as the shaft runs up and lifts on its oil wedge, it will rise and move a little to the right. In a plain bearing, this can also provide further confirmation that the probes are correctly oriented – if not, the shaft movement will appear to be in the wrong direction for the direction of rotation. The plot in Figure 9 (right) is for a tilt-pad bearing, where movement is typically almost purely vertical.

But if we also know the bearing clearance, and can overlay this in the plot, we are now able to gain some further very useful insights. Firstly, we can calculate the **Shaft Eccentricity Ratio**  $\epsilon$  (epsilon), as:

$$\epsilon = d / c$$

Where:

- $d$  = distance between shaft centreline and bearing centreline (i.e., in an SCL plot, the distance of the running position from the centre of the clearance), and,
- $c$  = bearing **radial** clearance (half the ‘bumping’ or diametral clearance).

A typical healthy value is around 0.5 – 0.6, however:

- $\epsilon = 0$  indicates concentricity within the bearing (Figure 10, Left), and a trend towards 0 can indicate the potential for instability issues.
- $\epsilon = 1$  indicates contact with the bearing wall (Figure 10, above left); and a value approaching 1 indicates preload condition.

Secondly, we can also calculate the **Rotor Position Angle**  $\psi$  (psi). For horizontal machines only, this is the angle between:

- A vertical line through the bearing centre, and,
- A line connecting the centre of the bearing and the centre of the shaft (in an SCL plot, this is the same as the angle of a line through the running position and the centre of the clearance overlay).

Positive angles are measured in the direction of rotation. This parameter can also help identify rotor preloads. A plain bearing  $\psi$  is normally around  $+30^\circ$ , (Figure 11) whilst that for a tilt-pad bearing should be close to zero. But horizontal offset misalignment could increase the angle, or even push it in the opposite direction to a negative value.

Please note there are always exceptions to any rule; for example, things are very different in gearbox applications because of the effects of ‘gear climb’ pushing the rotors in different directions. You could argue that preload is inherent in geared applications! But the above will hold true in most other horizontal shaft applications.

### Summary

The body of knowledge for fluid-film bearing vibration analysis is vast and complex, and a broad and detailed understanding of all aspects requires a great deal of training and experience. There is always more to learn, and it is a significant focus of our VCAT3 course, although a yet more comprehensive is afforded by VCAT4 and various other machinery diagnostics training offerings on the market. An article such as this can only graze the surface of the topic, and yet, an in-depth technical understanding of rotor dynamics is not strictly necessary for a newcomer to arrive at some effective conclusions, armed with just a little knowledge of the more common analysis tricks. And of course, the most common traps leading to false positives! This is what we tried to offer here.



Chris White, Technical Authority, Wood PLC

### Chris White, Technical Authority, Wood PLC

Chris White completed a 22-year career service in engineering roles in the UK Royal Navy, working mainly in submarine nuclear propulsion as a chief engineer; it was here he first became involved with rotating equipment vibration. Since leaving the service, he has specialised in vibration troubleshooting and predictive maintenance, working with the mining, oil and gas and utility sectors. Chris provides support as a Technical Authority to Wood’s vibration, dynamics and noise team, and is responsible for authoring and delivering certified public vibration training courses per ISO 18436. He is a certified Category 4 Vibration Analyst, a member of the US Vibration Institute, and holds a BSc in Computer Science and an MEng in Mechatronics.

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The company's commitment to excellence ensures the supply of quality, durable products that enhance efficiency and cost-effectiveness for customers. The philosophy, 'Understand to Undertake', embodies ASG's approach to providing a competitive edge to clients by aligning with their strategic business objectives.

ASG offers an extensive product lineup, including ultrasonic testing instruments, eddy current instruments, industrial radiography, magnetic particle instruments, hardness testing instruments, IRIS tube inspection, real-time digital radiography systems, and rail testing equipment. These solutions are designed to improve technical performance, reduce asset risk, and enhance safety.

The hands-on experience within the inspection and integrity industry positions ASG to respond swiftly and effectively to customers' needs. By leveraging a global supply chain network and deep industry knowledge, ASG provides the right products for any inspection campaign, ensuring the highest quality at cost-effective prices. Trust ASG to deliver the best in non-destructive testing equipment, backed by unparalleled service and support.

For further information: [asgndtsupplies.com](http://asgndtsupplies.com)



### Award Winning Lightweight Tube Heads from Comet

Comet (formerly known as Yxlon) recently introduced their ECO series tube heads for radiographic testing. This new range of systems offer high

levels of performance from their constant potential X-ray sources, but start off at a svelte 13kg for the 160kV model. In fact, their ergonomic design won Comet a prestigious Red Dot Product Design Award this year.

Their low weight makes them ideal for difficult to access jobs and are ideal for single person scenarios being easy to carry and handle, as well as reducing staffing requirements. Following in the footsteps of

the EVO series tube heads, the ECO series benefit from lightweight composite construction and the same reliability as their predecessors.

Available in 160 and 200kV models, the units are protected by a sturdy, robust casings with a high-quality metal ceramic X-ray insert. The systems meet IP65 standards allowing you to operate freely in dusty and wet conditions.

Their small focal spot size of 1mm ensures optimal image quality, while constant potential source minimises exposure times, resulting in increased productivity.

For further information: [axt.com.au/products/eco-series-tube-heads/](http://axt.com.au/products/eco-series-tube-heads/)



### EN DE TEK Australia

EN DE TEK Australia's

industrial borescope systems have always excelled in saving time and money for their customers. With cutting-edge technological design enhancements and flexible ergonomic features, their borescopes lead the industry. EN DE TEK Australia continuously upgrades their hardware to ensure top-notch performance in non-destructive remote visual inspections.

Recent improvements in resolution, tip articulation, illumination, and modularity make our borescopes ideal for complex inspections across various fields, including pipe and tube inspections, engine gearboxes, building and pest control, industrial manufacturing, tanks and vessels, underwater inspections, steel mills, border security, police, defence, and aviation.

They offer flexible probes from 1.8mm to 8.0mm in diameter with lengths ranging from 1 Mtr to 15 Mtr with two-way and four-way tip articulation. These probes can be customised upon ordering with varying viewing directions and depths of field. The probes are all designed to be modular for quick field swapping at the job site. All pixel resolutions vary across the range from 160,000 up to 1080P and all probes offer high-intensity LED illumination.

Newer and more sophisticated versions of their videoscope range such as their Dellon VX, GL, and SVPro provide 2D, and 3D high-definition dimensional measurement in real-time to measure cracks as fine as silk threads. Three-dimensional colour modelling facilitates intuitive analysis.

For further information: [endetek.com.au/borescopes](http://endetek.com.au/borescopes)



### Hot Engineering

Hot Engineering is a leading fabrication and engineering company dedicated to providing

high-quality, custom metal fabrication solutions to clients across various industries. Based in Mudgee, New South Wales, their skilled tradesmen and engineers work closely with customers to deliver tailor-made solutions that are durable, efficient, and cost-effective.

With a proven track record of excellence, they specialise in steel fabrication, repairs of mining equipment, new builds for mining or earthmoving equipment, architectural metal work and structural frame works. Hot Engineering offers expert structural engineering services, including design analysis, feasibility studies, and structural calculations, ensuring the integrity and safety of every project.

Founded in 2017 by Hamish Bryant and Truman Goonery, Hot Engineering is built on passion, understanding and the drive to deliver quality and precision to every project. With ISO accreditation, qualifications and standards, and an experience team, Hot Engineering delivers enduring, tailored-made solutions for clients from all over the central west and eastern seaboard in NDT, AINDT magnetic particle testing, and welding inspection.

Their NDT technicians are skilled professionals trained to perform magnetic particle testing to assess the integrity, quality, and reliability of materials, components, and structures without causing damage.

For further information: [hotengineering.com.au](http://hotengineering.com.au)



### Smartchem Industries

Smartchem Industries is your trusted partner

for magnetic particle and dye penetrant requirements, with over 100 years' combined experience in the manufacture and distribution of magnetic particle and dye penetrant consumables.

Smartchem is 100% Australian owned and proudly manufactures in Australia with Australian resources where possible. Smartchem prides itself on service, both technical and in the delivery of their products.

The Smartcheck MPI range is batch tested to ISO-9934.2. Its Certificates of Conformances (CoC) are compliant to the new ISO Standard, including the requirement to detail batch test results. CoC are emailed with dispatch advice where requested. All CoC and SDS

are available on their website; a useful reference tool for an audit or where a copy is required in the field.

The Smartcheck dye penetrant range has been third party type tested to ISO 3452.2 by MPA Hanover in Germany, including Smartcheck Dye Pen Fluoro—a level 3 water washable/solvent removable fluorescent dye penetrant.

SmartChem supplies direct and has a comprehensive network of resellers. Heatleys Safety and Industrial ([heatleys.com.au](http://heatleys.com.au)) are their exclusive distributor in Western Australia, while Accurate Instruments ([accurate.kiwi](http://accurate.kiwi)) cover both the North and South islands in New Zealand. For distributors on the east coast of Australia, contact Smartchem direct.

Quality products and service at a reasonable price, that's the Smartchem difference.

For further information: [smartchem.com.au](http://smartchem.com.au)



### Wood

With 35,000 professionals across 60 countries, Wood PLC is one of the world's

leading consulting and engineering companies operating across the energy and resources markets.

Here in Australia, the broad range of services they offer their clients includes machinery vibration and lubrication analysis for all types of equipment, across all industries. Their certified personnel can provide end-to-end routine measurement, analysis, and reporting; alternatively, we will supplement your people to match your needs. Wood is vendor-agnostic and works with a wide range of wireless, wired, and portable hardware and software platforms to provide routine and troubleshooting services to the very highest level.

But they do not stop at finding and diagnosing problems – from skid to piping to vessel, they have an unrivalled track record of engineering actionable solutions. Wood also offers machinery alignment and balancing, optical motion amplification, thermography, bearing failure analysis, root cause analysis facilitation, FEAs, flow analysis, noise studies and much more.

And they practice what they teach. Wood offers vibration and lubrication analysis training per ISO 18436 Parts 1 to 4, with optional AINDT certification. Their public courses are delivered in Perth and Brisbane by active principal practitioners with decades of experience; alternatively, they can provide bespoke courses at your site or venue. Wood currently offers LCAT1, VCAT1 and VCAT2 training, and will be expanding their catalogue soon.

For further information: [vdn.woodplc.com](http://vdn.woodplc.com)

# NDT World Event Calendar

## 36th EWGAE 2024

18 to 20 September 2024 | Potsdam, Germany

The EWGAE conference is a prestigious international forum for researchers, engineers, and practitioners who are interested in the field of acoustic emission. The conference aims to provide an opportunity for participants to exchange ideas and share the latest advances in the field of acoustic emission, including theoretical and experimental investigations, instrumentation, data analysis, and applications. The conference will feature keynote lectures from renowned experts in the field, as well as technical sessions, poster presentations, and panel discussions. Plus, it includes social events that will provide opportunities for networking and building new collaborations.

For further information, visit: [ewgae2024.com/](http://ewgae2024.com/)

## The 3rd World Congress on Condition Monitoring

15 to 18 October 2024 | Beijing, China

The primary objective of the World Congress on Condition Monitoring (WCCM) is to exchange worldwide research and application achievements on condition monitoring and related areas, with particular emphasis on scientific and technical development, industrial applications and cooperation worldwide. The Congress is aimed at providing a worldwide platform to scientists and practitioners in both academia and industry. Sessions will focus on: signal detection and processing; CM and NDT instrumentation and methods; diagnosis, assessment and prediction; CM of core components, systems and facilities; and advanced CM technology.

For further information, visit: [www.intiscm.org/](http://www.intiscm.org/)

## ASNT 2024

21 to 24 October 2024 | Las Vegas, USA

ASNT's annual conference invites professionals from across the industry to actively participate, connect and collaborate. The theme of Engage reflects ASNT's commitment to fostering meaningful interactions, sharing knowledge, and pushing the boundaries of non-destructive testing. In the vibrant setting of Las Vegas, attendees can expect over 100 technical sessions, 100 exhibitors and 2,220 delegates. From innovative technologies to insightful discussions, ASNT 2024 promises an experience where individuals can come together, exchange ideas, and contribute to the advancement of non-destructive testing practices.

For further information, visit: [asnt.eventsair.com/asnt-2024](http://asnt.eventsair.com/asnt-2024)

## NDE 2024

12 to 14 December 2024 | Chennai, India

The 34th Annual Conference and Exhibition on Non Destructive Evaluation will be hosted by the Indian Society for Non-destructive Testing (ISNT) in Chennai in December. With over 50 keynote talks, 40 technical sessions and over 120 exhibitors, it is shaping up to be an engaging event. It is set to attract over 2,000 delegates. Chennai is one of India's largest and most vibrant cities, known for its rich cultural heritage, historical landmarks, and thriving economy. The city is a major economic hub in India, with a diverse economy that includes industries such as automobile manufacturing, information technology, healthcare, and the film industry, contributing significantly to India growth.

For further information, visit: [isnt.in/](http://isnt.in/)

## 3rd International Conference and Exhibition on NDE 4.0

3 to 6 March 2025 | Bengaluru, India

The International Conference on NDE 4.0, a pivotal event initiated by ICNDT's Special International Group, focuses on the integration of Industry 4.0 technologies in non-destructive evaluation and inspection. This conference highlights advancements in robotics, drones, AI, machine learning, IIOT, augmented reality, and digital twins, revolutionising industrial inspections. Following successful events in 2021 and 2022, the third conference will be held in Bengaluru, India. It will feature an exhibition showcasing cutting-edge products and services, offering attendees opportunities to share knowledge, network, and accelerate NDE 4.0 adoption in their industries.

For further information, visit: [2025.nde40.com/](http://2025.nde40.com/)

## Pan-American Conference for Non-destructive Testing

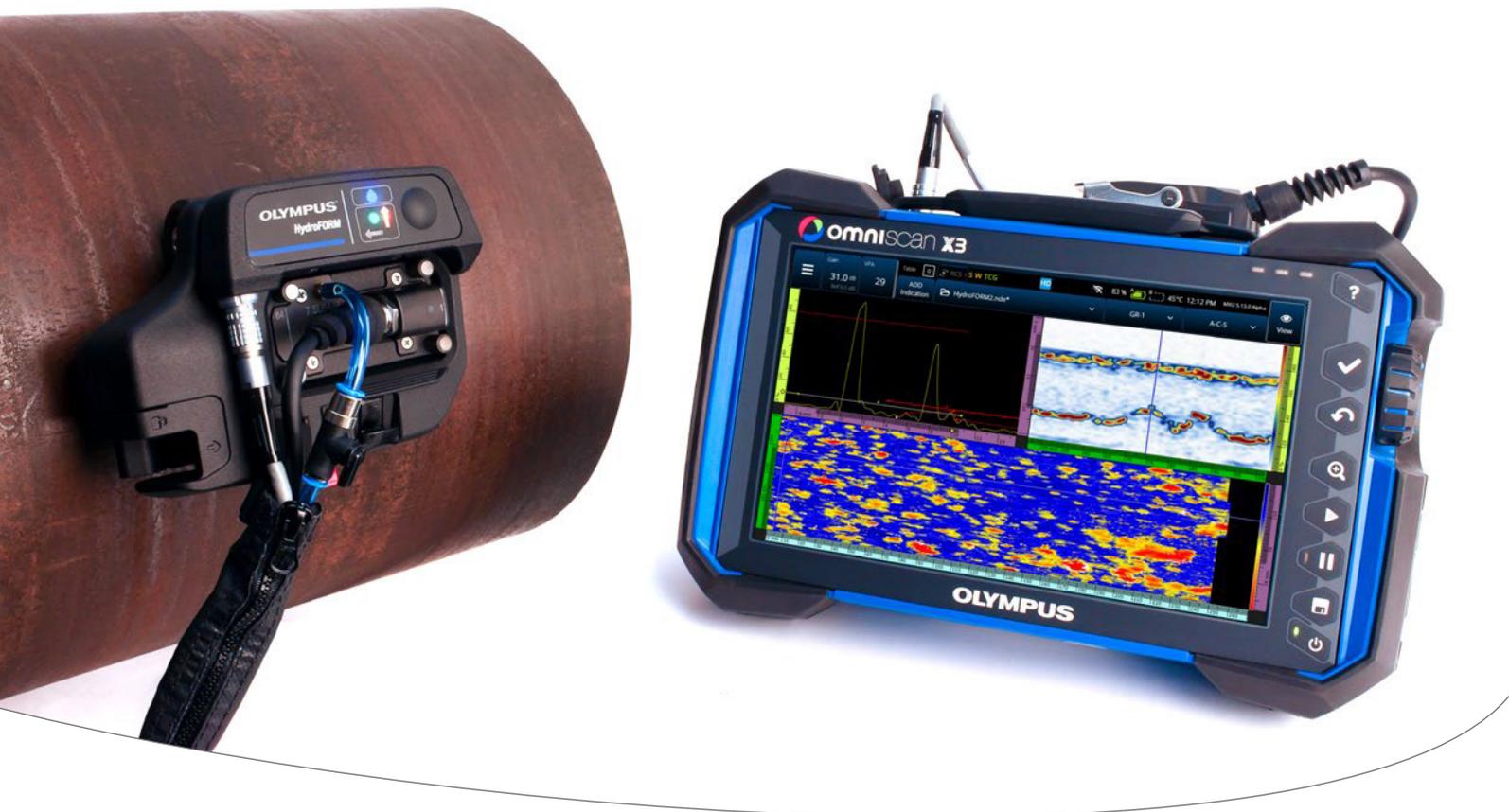
9 to 12 June 2025 | Ontario, Canada

The next Pan-American Conference for Non-destructive Testing (VIII PANNDT) will be held at the Fallsview Casino Resort at Niagara Falls in Ontario, Canada from 9 to 12 June 2025. The exhibition area will have space for over 100 booths. This valuable conference is a must-attend event for inspection, quality assurance, quality control, manufacturing, and non-destructive testing personnel. The program will feature presentations from leading researchers, technicians, companies, and organisations who will demonstrate the latest technologies, trends, tools, and techniques. The conference is being hosted by the Canadian Institute for Non-Destructive Evaluation.

For further information, visit: [www.panndt.org/panndtconference](http://www.panndt.org/panndtconference)



## Powerful Corrosion Solution Package



### OmniScan™ X3 16:64 Flaw Detector & Next-Gen HydroFORM™ Scanner

Optimized for compatibility and efficiency, the OmniScan X3 and HydroFORM scanning package transforms your corrosion inspection workflow.

#### Easy Setup

The OmniScan X3 scan plan wizard and features such as automatic probe detection make setting up your HydroFORM configuration quick and easy.

#### Fast and Efficient Phased Array

Offering excellent coverage and resolution, the OmniScan X3 flaw detector and HydroFORM scanner produce phased array imaging data that is easy to use and understand.

#### Improved Data Accuracy

The scan speed warning light on the HydroFORM scanner's ScanDeck™ module enables you to acquire high-quality data on your first pass, avoiding the need to rescan.

To learn more, contact your local Evident representative or visit [EvidentScientific.com](http://EvidentScientific.com).



[EvidentScientific.com](http://EvidentScientific.com)