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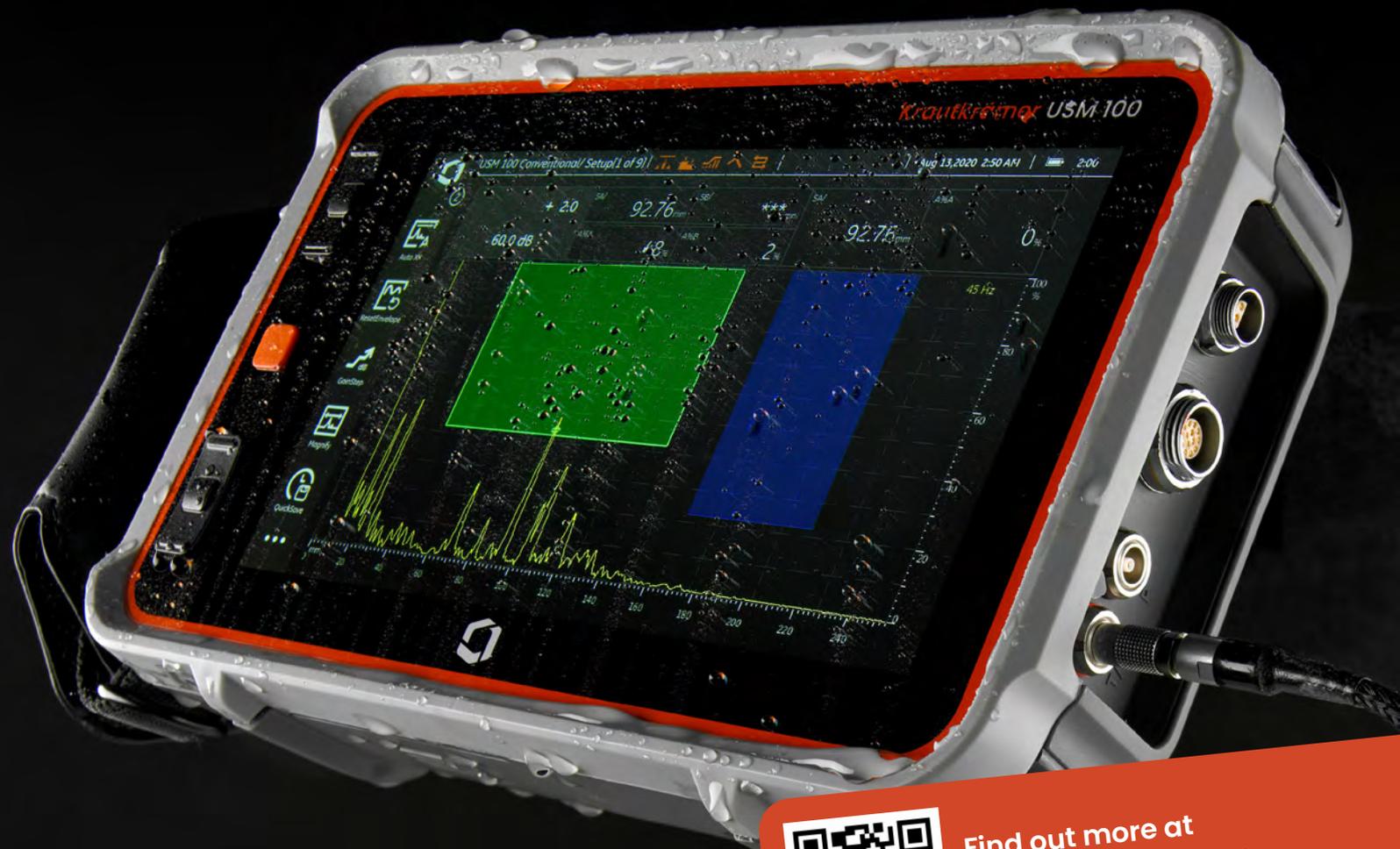
THE OFFICIAL JOURNAL OF THE AUSTRALIAN
INSTITUTE FOR NON-DESTRUCTIVE TESTING

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President's Message

May/June 2023



Dr. Irene Pettigrew

It is my pleasure to present to you the latest issue of the AINDT journal, which features articles and research related to the ever-important topic of condition monitoring, CM.

CM is the practice of regularly monitoring the performance and health of machinery and equipment to detect any potential problems or defects before they lead to failure. This asset health diagnosis allows

preventative actions being taken as soon as potential failure is detected. Effective conditioning monitoring is critical to ensuring the safety, reliability, and longevity of industrial systems, as well as minimising downtime and maintenance costs. CM is prevalent across a range of industries, from manufacturing, transportation to energy and infrastructure. Effective CM has become more important than ever before with the increasing complexity of modern systems.

Some of the commonly used technologies and techniques for CM include vibration analysis, oil analysis, infrared thermography, ultrasonic testing, acoustic emission, and motor current analysis. Data analytics coupled with the Internet of Things (IoT) has transformed the prediction of defect occurrence and planned maintenance. CM uses the data collected and analyses this in correlation with repair history, external influences and conditions, to output assumption-based conclusions. Whilst these technologies can be readily implemented, there are hurdles to overcome and one of the biggest faced surrounds training, competency, and succession planning. Companies may also have implemented the appropriate CM technologies but fail to react on the information they are provided.

Equipment criticalness for safety and to the business, cost benefit analysis of installation of a CM system to push out and reduce maintenance intervals, inventory availability or longer lead times, downtime for implementation, environmental operating conditions, poor equipment condition, fault frequency, and installation options for the real estate and access for the sensors and CM equipment, are key factors to consider in CM implementation.

There is an abundance of successful CM monitoring programs in place throughout Australia. Mining companies including BHP Billiton and Rio Tinto use vibration analysis, oil analysis and other real-time CM techniques to monitor the health of critical equipment such as locomotives, crushers, mills, and conveyors. The rail industry uses CM for tracks, signals and rolling stock. As an example, ultrasonic testing is used to detect cracks in the wheels helping to improve safety and maintenance costs by identifying and replacing defective wheels before they cause major problems. Our sister society, BINDT recently reported in their Condition Monitor journal

in March, of UK-based company Northern showcasing light detection and ranging (LIDAR) technology, made famous by NASA to map the surface of the moon, aboard its Intelligent trains concept train. LIDAR Horizon scanning cameras consists of a radar dome, 180° thermal imaging software, acoustic monitors, a G-shock bogie and an artificial intelligence (AI) camera. Installing this technology will enable real-time diagnoses of engineering issues on track and other infrastructure, which can be addressed as part of planned maintenance rather than having to react when things go wrong. Hopefully this advancement in technology will be rolled out globally to make journeys by rail safer and more efficient.

CM is also used for turbines, transformers, and generators in the energy sector. Having the ability to use an IoT model to collect data from numerous sensors across the world helps generate a predictive fault detection mechanism with help from mathematical modelling. One of the major benefits of remote monitoring is avoiding expensive maintenance site visits for check-ups of the equipment. The manufacturing industry leverages off CM to monitor pumps, motors, and gear boxes. Of course, when all the machine parameters operate within the defined limits, then the machine or part life expectancy will be understood but these are often significantly reduced by various external factors reducing the overall usage period. Having a well thought out CM program will help prevent failure.

CM technologies in conjunction with advanced signal processing techniques are common practice within the defence sector for aircraft engines and helicopter gear boxes.

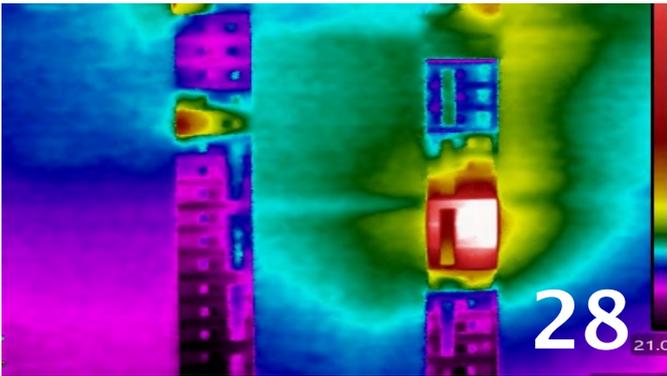
It is easy to recognise from these examples that CM is everywhere in our everyday lives.

In this issue, we are proud to present a diverse range of articles that explore the latest advances and techniques in condition monitoring including:

- The use of machine learning and artificial intelligence in CM
- Novel sensors and instrumentation for more accurate and comprehensive monitoring
- Case studies and real-world examples of successful condition monitoring applications
- Emerging trends and future direction in the field of CM

We hope this information will provide valuable insights and inspiration for researchers, practitioners and professionals who are working to advance the state of the art of CM. It is our responsibility to continue to push the boundaries of what is possible and work towards better, more innovative solutions for ongoing monitoring and maintenance. Through ongoing collaboration and dialogue, we can help prevent future catastrophes and ensure a safer, more reliable future for all.

Haste Ye Back!
Dr Irene Pettigrew



AINDT News

President’s Message May/June 2023 1

From the Institute 4

Non-destructive Testing Certification Board (NDTCB) – Chairperson’s Message 4

Condition Monitoring Certification Board (CMCB) – Chairperson’s Message 5

Member List 6

Membership Registrar’s Message 7

AINDT Federal and Board members 2022–2023 8

A Decade of Producing the *Industrial Eye* 9

2023 AINDT Certification Process and online portal updates 10

WA Branch News: AINDT at the Energy & Mining Collaboration Networking Event 12

WA Branch News 13

VIC & TAS Branch News 14

SA & NT Branch News 16

AQB Availability 18

Condition Monitoring Training Centres 19

Benefits of AINDT Membership 20

Member Profile: Shaina Johnson 22

NDT World Event Calendar 2023/2024 24

AICIP News

AICIP lobby’s for Sovereign National Qualifications 26

Industry News

Standards Report by Angelo Zaccari Chairperson MT007 27

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Thermography in Action	28
Reliable and Dynamic Condition Monitoring for load-bearing building structures	30

Feature: Condition Monitoring

Condition Monitoring Strategies for Maintenance and Manufacturing Optimisation	32
Introduction to Industrial Vibration Analysis	34

Product & Services

ARI	43
Chemetall	43
Industrial Mining Inspection Solutions	43
OMS	44
Russell Fraser Sales	44
Vertech Group	44

Cover Image

Thermal view through a vented cover, image taken by Peter Milligan
AINDT CEO



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INSTRUCTIONS TO AUTHORS OF TECHNICAL ARTICLES
Manuscripts should be submitted in electronic form:
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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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From the Institute

The past few months at the federal office have been filled with enthusiasm, as we witnessed significant changes and updates taking place.

We are thrilled to announce that this will be our second online journal publication, following the tremendous success of our first online journal, "Industrial Eye – Vol 10 Issue 2 – March–April 2023."

This journal received a remarkable 62.6% open rate and reached over 15 countries, including Japan, New Zealand, USA, and Portugal, to name just a few. With 13,651 unique impressions, it truly made an impact on readers worldwide.

In addition to the journal publication, we are pleased to inform you that the AINDT E-Newsletter has been relaunched, with the first edition of 2023 distributed in May. The relaunch of the E-Newsletter will serve as a source of information, covering institute, branch, and affiliate events. We highly recommend subscribing to stay up to date with the latest news from the AINDT and the NDT and CM industry.

We are always on the lookout for captivating content for both the *Industrial Eye* journal and AINDT E-News. If you have any interesting stories, topics, or technical articles that you would like to see published, please don't hesitate to contact us at office@aindt.com.au. Your contributions are greatly valued and appreciated.

Within our team, we have recently witnessed some staff movements at the federal office, with individuals transitioning into new positions.

Hanain Rajab, our Certification Administrator NDT, has been with us for seven months and has already made a significant impact in her role. With a wealth of

knowledge in NDT certification, Hanain is dedicated to addressing all your NDT certification needs.

Juandri Potgieter, previously our NDT Certification Administrator, has taken on a new role as the AICIP and CM Certification Coordinator. We warmly welcome Juandri into her new position, and we are confident that she will excel in her responsibilities, providing exceptional support to the AICIP and CM boards.

We are also delighted to announce that Uma Sudhakah Putan has assumed the role of Office Manager. Uma has been an integral part of the AINDT since 2011, starting as a Certification Administrator and progressing to Senior Certification Administrator and Finance Officer. As the new Office Manager we have no doubt Uma will continue to make a significant contribution to AINDT.

However, it is with sadness that we bid farewell to our long-term Journal Editor, Fiona Obaidini. Fee has been an invaluable asset to the AINDT team, having joined the institute in 2012 after previously producing the Materials Australia Journal for 5 years. Fiona played a crucial role in the rebranding of the AINDT Journal into the widely recognised *Industrial Eye* and has been key in developing lasting relationships with our advertisers and sponsors. Having produced 63 journals over the past 10 + years, we appreciate her dedication and effort. Fee will be commencing a new role as full time Territory Manager for Alfresco Gardenware, and while we will miss her contributions and warm and engaging nature, we wholeheartedly wish her the best in her new career.

As we continue to strive for excellence and provide our members with exceptional publications and updates, we extend our gratitude to all our readers and contributors who keep the AINDT community informed and committed. Stay tuned for more exciting developments and valuable content in the coming months.

Non-destructive Testing Certification Board (NDTCB) – Chairperson's Message



Barry Cooper

The most recent updates to the AINDT Guide to Qualification and Certification introduce a new provision, specifically Paragraph 3.18, which defines the Renewal process. Renewal refers to the initial 5-year period following the completion of your last comprehensive practical examination. While Paragraph 3.19 of the Guide discusses the Recertification Process which pertains to the subsequent

5-year period occurring 10 years after your last full practical examination. It is important to avoid any confusion between these two distinct processes.

I would like to explore and highlight two subparagraphs within the Renewal Process (1st 5-year period) within Paragraph 3.18 of the Guide:

3.18d) successful completion of a practical examination element in accordance with Section 5 except that it shall consist of a minimum of 50% of the examination specimens required by Section 5; or 3.18e) successfully meeting the requirements of the structured credit system as given in 13.19.5.

Candidates at the Renewal Stage (1st 5-year period) have the option of either a practical examination (minimum of 50% of exam specimens) or can use the Structured Credit System detailed in Table C.1. If you elect the Structured Credit System, you will need to collect evidence for every year throughout the five years. A Renewal candidate at Level 1 and Level 2, need to be accumulated Points from Table C.1 Part A, with the option of points from Table C.1 Part B. for Level 1 (75 points minimum), or Level 2 Candidates (50 points minimum) from Part A. Level 3 Candidates require points from both Part's A & B of Table C.1.

For both Renewal and Recertification (every 5-years), candidates also need to provide: verifiable documentary evidence of continued satisfactory work activity (a minimum of 50 hrs per year in the method) without significant interruption in the method and sector for which certificate renewal is sought.

This 50 hours per year includes the whole task, not just the on-job activity. For example, an MT task would include reading the procedure, meeting safety requirements, performance checks (lighting checks, yoke lift test, system performance test etc), preparing for the inspection (surface preparation, visual inspection and applying white background lacquer), performing

the inspection, viewing, interpretation of results, post inspection requirements (cleaning and demagnetising), plus recording and reporting results. It does not include travel time.

The CB would like to remind all Candidates not to wait until the last moment to gather your documentary evidence to either Renew (1st 5-year period) or Recertify (2nd 5-year period).

The process of Renewal (1st 5-year period) is now quite complex, and candidates need to read the Guide carefully and don't delay with accumulating your renewal evidence, if you go down the Structured Credit System pathway. The Recertification process (2nd 5-year period) has not changed, with all candidates required to sit a full practical exam.

The implementation of ISO9712-2021 led to these modifications and were not driven by the Certification Board. Please download the latest version of the Guide from the AINDT Website: aindt.com.au/Documents/DocType/View/DocID/3263

Barry Cooper
Chairperson – AINDT NDT Certification Board

Condition Monitoring Certification Board (CMCB) – Chairperson's Message



Shawn Moore

The CMCB are continuing to prepare examination papers for implementation in a complete digital format. This will enable all candidates in the future to take tests electronically.

This will avoid the printing of examinations and will also provide greater protection of the examination data base security. Other benefits will include the efficient collection of data from the examination results for review, and improvement of the examination question data base overtime.

The current collection of data being paper based involves considerable time to review and collect the data for review of the examination questions.

Transition to the electronic examinations will have many benefits in the longer term for the board.

AUSPTA will be holding a thermography conference in Brisbane at Hotel Grand Chancellor, Brisbane, Queensland on the 27 October 2023.

This is the first time AUSPTA has held a conference in Queensland. It presents a fantastic opportunity for participants to engage with various presentations covering diverse subjects such as condition monitoring for mining, electrical systems, and numerous other areas related to thermography and condition monitoring.

For further details check out the website www.auspta.asn.au. All registrations include complimentary morning tea, lunch, and afternoon tea. Attendance at all AUSPTA events is free for members and their guests.

Shawn Moore
Chairman – AINDT CM Certification Board

Member List

May 2023

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

Through the State Branches and Federal Office, the AINDT aims to be an efficient and effective technical society by operating as a recognised notification body and providing membership to individuals, companies and government bodies who wish to keep informed or have an interest in non-destructive testing, engineering, or materials and quality testing in general.

AINDT provides businesses with the opportunity to be recognised as a contributor of this professional Institute by becoming a Company, Corporate or Sustaining member. By holding such membership, companies can benefit from advertising opportunities, heightened support, staff certification control and much more.

We would like to thank the following companies for their valued support:

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Metlabs Australia
MJ Engineering Inspection Services (Welshpool)
Vertech
NDT Instruments Pty Ltd
Weld Integrity
Wood – Asset Performance Optimisation

Membership Registrar's Message

Hi AINDT Members,

The AINDT CEO, Branch Presidents and Membership Registrar recently convened for their second meeting of 2023 with the aim of identifying opportunities to enhance the benefits provided to AINDT members. The key discussion points during the meeting were as follows:

AINDT Federal Office update

- The financial report from the APCNDT2023 conference is being finalised and will be issued to the Federal Office.
- The APCNDT2023 conference has received an abundance of positive feedback following the event. It is rewarding to hear that a majority of the attendees had an exceptional experience and took the opportunity to share their valuable feedback.
- The APCNDT2023 committee are highly commended for their achievements in creating such a positive event for the industry.

- In the upcoming months, branches will be organising their annual branch AGMs, presenting an excellent opportunity for active engagement with your branch. You can consider nominating as a branch councillor where you can subsequently be nominated by your branch as a representative on the Federal Council. This would grant you the opportunity to attend the federal AGM and Federal Council meeting, where you would assume the responsibility of representing your state at a federal level.

Future National Event

All branches are striving to offer captivating events for every member. Stay tuned and stay informed by regularly checking the AINDT E-Newsletter and Website for updates and event schedules.

Branch Activities

- All branches will host AGM's in the coming months.
- Monthly meetings continue. Contact your local branch for more information.

Regards

Craig Taylor



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AINDT Federal and Board members 2022–2023

The AINDT constitution requires that each branch nominates councillors to Federal Council, depending on the size of branch membership (i.e. for 20–100 members, 2 representatives; 101–200 members, 3 representatives; and over 200 members, 4 representatives).

The AINDT constitution also gives Federal Council the power to appoint committees to which it can delegate responsibility, to propose policy and perform specific functions.

The two main committees of Federal Council are the Executive Committee; comprising of the Federal President, Federal Secretary, Federal Treasurer, Immediate Past Federal President, Federal Vice-President and Secretariat Liaison, who make decisions on routine matters and any specific matters delegated by the Federal Council and Certification Board, which is responsible for certification scheme.

Convenors of committees are required to report annually to Federal Council on policy and coordination of branch/committee activities in their particular field of activity.

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 Commercial Provider: Keith DCruz
 CMCB Practitioner: Sarel Klopper

A Decade of Producing the *Industrial Eye*

As I prepare to leave my role as the Managing Editor of the AINDT Journal, the *Industrial Eye*, I would like to reflect on the past 10 + years and express my gratitude to all the people who have contributed to its success.

Like many of you, NDT found me.... or rather, the AINDT found me. I was first approached by then CEO Stephen Roe in 2010 when I was working as journal editor at Materials Australia (MA). At the time, the AINDT had just established its own office directly opposite MA's office after years of MA providing secretariat services for AINDT. The AINDT went from a single employee; the highly competent Zofia, to what it is today; an office of 6 very busy employees. It was not until a couple of years later, under the guidance of CEO Les Dick, that the redesign of the journal came to fruition and the *Industrial Eye* was born.

I am proud to say that the *Industrial Eye* has become a valuable source of information and knowledge for the non-destructive testing (NDT) and condition monitoring (CM) community in Australia and beyond.

It showcases the latest research, innovations, applications and best practices in these fields, as well as providing insights into industry trends, challenges and opportunities. It keeps our members connected and informed, which was especially true over the COVID - 19 pandemic.

Producing a journal is akin to creating a jigsaw puzzle, with elements coming from many different sources. I have had the privilege of working with many of you to create each unique edition. The journal is the definition of team work and there are many people I would like to thank. Firstly, our graphic designer extraordinaire Alarna O'Connell who has ensured the journal's high quality of design. I have worked with Alarna for over 15 years and will miss collaborating with her and her great sense of humour.

Secondly, AINDT CEO Peter Milligan who has helped plan every journal, who has shared his vast knowledge and wholeheartedly put his trust in me, thanks for being such a wonderful boss Pete. A heartfelt thankyou to our amazing office manager Uma Sudhakar and the AINDT staff, we are like a family and I am grateful to have worked with you all.

My thanks to the journal's regular contributors I've enjoyed working with over the years; AINDT National Presidents Ian Hogarth, Pranay Wadyalkar, Paul Grosser, Neil Young, Nick Elefetheriou and Irene Pettigrew, NDTCB Chairpersons Keith Arcus and Barry Cooper, CMCB Chairperson Shawn Moore, Membership Registrar Craig Taylor, all of the state branch news contributors,



Standards Report contributor Angelo Zaccari and AUSPTA committee. Your contributions as volunteers to the journal and institute as a whole are invaluable.

I have also appreciated developing relationships with our regular advertisers and sponsors. My sincere thanks to Dorthe Svarrer from EVIDENT Scientific, Jim Tibani from Waygate Technologies, Jeanette Martin from NDT Equipment Sales, Russell Fraser from Russell Fraser Sales, Austin from ATTAR, Neil Burleigh from EN DE TEK and Neil Young from ARI for your consistent support of the *Industrial Eye* over the years. I will miss our bi-monthly conversations and laughs!!

Producing the *Industrial Eye* has been a rewarding experience for me. Over the past decade I have learned a lot and seen many changes to the industry and how the AINDT operates. When I first started, we would receive hard copy proofs from the printer to check before going to print, and now we have a fully electronic journal with interactive hyperlinks. The same advances in technology apply to the industry as a whole, but what won't change is the importance and impact of NDT and CM in keeping our communities safe.

Growth happens with new challenges, and as my daughter approaches high school, I'm ready for the next phase of my career. Combining my love of gardening and sales, I am commencing new employment as a territory manager for VIC, SA and WA with wholesaler Alfresco Gardenware. Finally, I am confident that the journal will continue to thrive and develop, and I wish the best of luck to my successor and to everyone involved in the *Industrial Eye* and the AINDT.

**Best Regards,
Fiona Obaidini**

2023 AINDT Certification Process and online portal updates

In this journal article, we aim to provide members with a comprehensive update on the notable changes to the certification and online portal processes since the start of 2023.

It is widely known among our readership and members that the AINDT exclusively accepts applications for membership and certification via the AINDT online portal. Paper application forms are no longer accepted unless specifically requested as amendments to existing applications, as the current system does not allow applicants to make amendments once an application is submitted through the portal.

As an organisation, we hope this process will help to fast track the certification process and make it as user friendly as possible. As always, we welcome your feedback, in order for us to continually improve our systems and processes.

In our efforts towards our paperless approach, as of the 1st of June 2023, the AINDT NDT certificates will only be available for electronic download via the online portal, conveniently allowing ID cards to be viewed on the portal using any smart device. Hence the AINDT will no longer distribute printed certificates and I.D cards. Please keep an eye on the website, social posts and AINDT E-news for updates and more information closer to the time.

CM Certification

At present, our team is actively working on the implementation and integration of the CM application process on the online portal. Currently all CM applications are being processed manually. As of now, existing CM certification holders will not be able view their certification on the 'Certification search' feature on the AINDT website. However, we are looking forward to providing an update soon, once this process is completed.

International transfer applications

In order to transfer a certification to AINDT, we need to first determine if the transfer process is possible for the specific applicant.

To ensure a speedy and efficient process for all applicants wanting to transfer an international application, we request that applicants ensure they email copies of all relevant documents to the federal office team for pre-approval, in order for our team to be able to accurately determine transfer eligibility, relevant documents include the following:

- current certificate with expiry dates

- last practical exam results
- Details of which method/s you wish to transfer and the year you first gained your certification.

Documents can be emailed to ndtcertification@aindt.com.au

Once we can confirm transfer, we will inform you by email and advise you of the steps required to be able to transfer your certification to AINDT.

At this stage you will be required to submit the following:

- AINDT application forms to transfer as well as renewal/recertification forms if due with current certification body.
- Submit a copy of the original application submitted to the Certification Body whom certification transfer is requested.

For more information regarding transfer applications, we encourage you to visit our website to view the AINDT Guide to Qualification and Certification.

Access to the AINDT Portal

For those members or certification holders who have yet to access the portal, you will first need to retrieve your password from the database. This can be completed easily by accessing the portal login page via the AINDT website.

Once you have reached the login page, you can then click the 'Create Account/Forgot password' tab as per the image below:

Once you have been redirected you will be presented with the following page options.

Held AINDT Certification Or Membership Before?	Are You New To AINDT And Need An Account?
<p>Select this option to retrieve your AINDT Portal login and information held by AINDT regarding your membership and certification.</p> <p>To recover or set your account information, you will be required to provide either a Certification Number from an AINDT issued Certificate or Membership Number as well as primary correspondence email address held on file by AINDT.</p> <p>Retrieve My Information</p>	<p>Select this option if you're new to AINDT and have never held Membership or an AINDT Certification.</p> <p>This process will guide you through the set up of a new account and provide you with both a Membership and CB number to allow you to apply for Certification.</p> <p>Apply for New Account</p>

We strongly emphasise the significance of refraining from applying for a new account if you are already a current or past member or hold certification with the AINDT. Instead, choose the option 'Retrieve My Information' if you believe you have held Membership or Certification with the AINDT at any point.

If you are certain that you are a new customer and/or have never had any prior interactions with the AINDT, you should select 'Apply for New Account'.

To retrieve your information and password from the AINDT database, you will be required to enter your CB number and the email address you have registered with the AINDT when you first applied with AINDT (initial certification application). Please only use the registered

email address or you will not be able to receive the retrieval email containing the password reset link. If any users are unsure what the registered email address is, please contact the Federal Office and our staff will be happy to assist you with this process.

Once you have completed the details requested above, you will be sent an email to your registered email account allowing you to reset your access password. Once you have reset your password you will be able to access the AINDT online portal and your membership and certification details which will then allow you to update your details, apply for membership and/or certification and access and print your certificates.

Should you require any assistance in accessing or using the online system please feel free to contact the AINDT office and our friendly staff will be able to guide you through any issues you may have.



Structural Health Monitoring (SHM) gives you real-time insight into your critical rotating and static assets.

Find out more from our website.

WA Branch News: AINDT at the Energy & Mining Collaboration Networking Event

What a great night at the Energy & Mining Collaboration speed-networking event hosted by the Professional Networking Institute at The Claremont Hotel on Friday 12th May. The sold-out event of 200 tickets was packed with great representatives from so many industries. The Australian Institute for Non-Destructive Testing is proud to have joined as one of the collaborating organisations and offer free tickets to our members. Well done Georgina Maslen and the team for running such a great event!

With topics, trends and issues relevant to the many different groups in the region, the Professional Networking Institute (PNI) is partnering with other industry associations across the WA Resources (Mining, Oil & Gas and Renewable Energy) industry.

The aim of this Resources Collaboration event is to:

- Introduce the members of each industry group to each other, for us to reach more people and amplify impact and results from our professional networking
- Further develop both our professional networking skills and our professional networks, as well as developing our relationships in adjacent markets.

The evening's format was in typical Sundowner-style, but also included facilitated speed-networking across associations and the ability for people to gain additional information on the other WA Resources associations out there.

Representing the AINDT from the WA Branch council at our stand on the night were Paul Lavender, Colm Kinsella, Michael Needham and Richard Stocker.

We're hoping this will be an annual event and a great benefit to being a member of the AINDT.



Paul Lavender in amongst the crowd at the networking event.



Georgina Maslen.



Gintare Stocker & Richard Stocker.



Richard Stocker.



Colm Kinsella, Michael Needham & Richard Stocker.

WA Branch News

The 2023 West Kimberley Careers Expo was held on Thursday 30th March and Friday 31st March 2023 at the Broome Civic Centre. Over the two day expo, nearly 1300 students and youth from across the Kimberley had the opportunity to meet a wide range of employers, businesses and industry representatives and talk to them about pathways, training and future career opportunities.

This year's expo included:

- Stalls from over 40 employers
- Information sessions from universities
- Speed recruiting opportunities for school students
- Workplace visits for remote schools
- Career Tasters for remote students
- Access to the general public on the final afternoon

During their visits, the students were encouraged to complete an Expo Passport which contained "secret questions" relating to the various exhibitors that students could ask in order to dig a little deeper into career opportunities that they may not be aware of. This drove further opportunities out of the day and injected a strong enthusiasm for the students to visit as many potential employers as possible.

AINDT Vice President, Mr Richard Stocker attended this worthwhile event and he has communicated that it was an absolute pleasure to represent the Australian Institute for Non-Destructive Testing (AINDT) in supporting the broader Non-Destructive Testing industry in Australia, and in particular the Kimberley in WA. It was a great opportunity to rub shoulders with the bright young minds of the Kimberley to discuss career pathways in the Energy sector, including the great careers that the NDT industry has to offer.

At the stand, Richard brought along a radiographic film viewer with real world films contained typical defects that technicians would find in the field every day. This was a popular drawcard and a real hit with the students who enjoyed classifying and measuring the defects and comparing what they could see with medical radiographs they had seen throughout their own experiences. Providing this link between their own experience and the field of NDT really drove the message home and enabled the students to understand the basic concepts of radiography. It also allowed them to ask some clever and intriguing questions about the method, its uses and limits.

Students from year 6 through to year 12 from the following schools attended; Broome Senior High School, St Mary's High School, Broome Primary School, St Mary's Primary School, Broome North Primary School, One Arm Point Remote School, Looma Community School, La Grange Community School.

We look forward to adding this event to our annual calendar and attracting the best up and coming NDT technicians to the industry.



Georgina Malsen and Richard Stocker.



Students at the West Kimberley Careers Expo visit the AINDT stand.



WA Branch President Richard Stoker chats with students at the Careers Expo.

VIC & TAS Branch News

Important announcement: Save the date for the AGM at Two Birds Brewery in Spotswood!

Mark your calendars! This year's Victorian Branch Annual General Meeting (AGM) is set to take place on Friday, July 28 at the Two Birds Brewery in Spotswood. If you attended our previous event at this venue, you know it was a great success, filled with good attendance and enjoyable atmosphere. Don't let this opportunity slip by, make sure to join us for another memorable AGM.

Further information and complete details will be sent out closer to the date, ensuring that you have all the necessary information to attend. Keep an eye on your inbox for the upcoming announcement, as we look forward to your participation in this important gathering.

Don't miss out on this exciting event at the Two Birds Brewery in Spotswood. Save the date and stay tuned for more information. We can't wait to see you there!

Exciting Opportunity: Join the Vic Council and help enhance the branch for members!

Are you passionate about making a difference and improving the AINDT Victorian Branch for its members? Here's your chance to get involved! We invite you to consider joining the Vic Council. Nominations will open on June 1 and close on June 21. An email will be sent to all members with detailed information and instructions.

The Vic Council plays a crucial role, and your contribution can make a significant impact. Most meetings are held on Teams, typically once a month during the early evening. These meetings focus on key areas that directly affect our members, including discussions on technical events aimed at enhancing knowledge and organising social events to foster connections and networking opportunities.

By joining the Vic Council, you will have the opportunity to actively participate in decision-making processes, contribute ideas, and help create a vibrant and supportive community for all members. Your unique insights and expertise will be valued as we work together to address challenges and seize opportunities within the branch.

This is an excellent chance to make a meaningful difference and be part of a team dedicated to serving our members. Keep an eye on your inbox for the upcoming email with nomination details. We look forward to receiving your nominations and welcoming you to the Vic Council.

Let's collaborate, grow, and create a better AINDT Victorian Branch together!

AINDT Victorian Branch ISO Q&A Technical Night with Paul Grosser

The March AINDT Victorian Branch Tech Night at the Golden Gate Hotel proved to be an enlightening

and engaging event for attendees interested in non-destructive testing (NDT) practices and industry standards. Focusing on the topic of ISO9712:2021, the AINDT Guide to Certification and General ISO9712/ISO17025/Standards, the session provided valuable insights into the recent changes to ISO9712:2021 and offered a platform for attendees to seek clarification.

The event began with an overview of ISO9712:2021, the latest version of the ISO standard governing the certification of personnel involved in NDT. Paul Grosser delved into the significant updates and revisions made to the standard, ensuring that attendees were up to date with the latest requirements and guidelines. This presentation was particularly valuable for individuals' seeking certification or maintaining their existing ISO9712 qualifications. Paul provided responses, addressing concerns and uncertainties related to the interrelation between ISO9712 and ISO17025.

The choice of venue, the Golden Gate Hotel, provided a conducive environment for networking and knowledge sharing. Attendees appreciated the opportunity to connect with peers and industry professionals, further enhancing the value of Tech Night events.

In conclusion, the AINDT Victorian Branch Tech Night on ISO9712:2021 and industry standards was a resounding success. Thanks to Paul Grosser for effectively covering the recent changes to ISO9712:2021, ensuring attendees were informed about the latest requirements. The general Q&A allowed participants to seek clarification on industry standards, resulting in meaningful discussions and insights. The Victorian Branch and Paul Grosser should be commended for their efforts in providing such valuable professional development opportunities to the NDT community.

Tech Night: Welds in NDT with Sadegh Abbaspour

On May 2, an immensely successful tech night took place at the Golden Gate Hotel. The highlight of the evening was a comprehensive presentation by Sadegh Abbaspour, who shared his vast experience in weld techniques and provided valuable insights into the practical decision-making process involved.

Sadegh's expertise shone through as he delved into various welding techniques, offering real-world examples and explanations that resonated with the audience. The session proved to be so content-rich that it left attendees wanting more. To address this demand, a follow-up session is being considered to further explore the topic.

Responding to popular demand, certain techniques were intentionally skipped during this session to prioritise the discussion on the meaning of weld symbols on



Weld Tech Night: Attentive members



Weld Tech Night: Sadeh Abbaspour presenting.

drawings. This decision was well received by the audience, recognising the significance of understanding and interpreting weld symbols in the context of engineering drawings.

The commitment to meeting the audience's interests and delivering valuable content reflects the Vic Councils dedication to providing an engaging learning experience for the members. The venue, Golden Gate Hotel, proved to be an ideal setting for fostering a conducive environment for knowledge sharing and networking.

Stay tuned for more information on the follow-up session, as it promises to be another enlightening event that will deepen attendees' understanding of weld techniques and NDT. Make sure not to miss out on this opportunity to expand your knowledge in this critical field.

The AINDT Victorian Branch remains committed to organising informative and relevant events, catering to the professional development needs of its members. Events like these exemplify the branch's dedication to promoting industry knowledge and fostering a vibrant community of NDT professionals.

Call for Presenters: Share Your NDT Expertise with our Members!

Are you an experienced NDT technician or professional with valuable insights to share? We are seeking presenters who can captivate and educate our members on subjects of interest within the NDT field. The topic doesn't have to be the latest technology; it can be a niche area of NDT, a compelling case study, an innovative inspection approach, or even a deep dive into

a specific industry. We believe that every area of NDT has its unique lessons and learnings worth exploring.

For our upcoming tech night, we are planning three half-hour presentations, offering presenters an opportunity to engage our members with their expertise. This platform not only provides a chance to share knowledge but also contributes towards points for certification, showcasing your commitment to professional development.

Whether you have years of experience or possess specialised knowledge in a particular area, we invite you to step forward and be part of our event. Your presentation can inspire fellow NDT professionals, foster knowledge exchange, and spark meaningful discussions within our community.

If you are interested in presenting, please reach out to Paul, his details below, with a brief outline of your proposed topic. We welcome a diverse range of subjects and perspectives that can enrich our members' understanding and enhance their NDT practices.

Don't miss this opportunity to make a difference and contribute to the growth of our NDT community. Join us as we continue to promote excellence in non-destructive testing and provide valuable professional development opportunities for our members.

Submit your presentation proposal today and be a part of our upcoming tech night. Together, let's elevate the standards of NDT knowledge and expertise.

Paul Trigg (Victorian Branch President)
Mobile 0478 947 985
Email paul.trigg@evidentscientific.com

Introduction to NDT: Enhancing Understanding for Non-NDT Professionals with Paul Grosser

Upcoming event, "Introduction to NDT," featuring the renowned expert and exceptional presenter, Paul Grosser. This session, tailored for individuals who are generally non-NDT professionals, aims to provide valuable insights into the world of non-destructive testing (NDT) and its various techniques. It serves as a unique opportunity for engineers, students, and support personnel to gain a better understanding of NDT practices.

During this event, Paul Grosser will share his expertise, shedding light on the fundamental principles and methodologies of NDT. Whether you are an engineer seeking to familiarise yourself with NDT to better serve your customers or a student exploring career prospects, this session will equip you with valuable knowledge.

This event holds immense value for non-NDT professionals, as it provides a platform to gain a comprehensive understanding of NDT techniques. The opportunity to engage with Paul Grosser, a seasoned presenter renowned for his expertise, makes this event an unmissable opportunity.

Stay tuned for further details, which will be announced shortly. As this event is free of charge, we encourage you to spread the word and invite as many colleagues, customers, students, and support personnel as possible. The insights gained from this session will undoubtedly enrich your understanding of NDT and its applications.

SA & NT Branch News

Greetings from the SA branch!

The 2nd quarter of 2023 kicked off activities for the SA branch this year. The year seems to be progressing quickly, with the annual AGM and social evening fast approaching.

SA was fortunate to have held 2 technical events this quarter. Mr. Paul Grosser generously travelled to Adelaide and delivered an 'Introduction to NDT' course at the West Lakes Hotel on the 4th of May. Covering the basics of the main NDT inspection methods, Paul delivered a 4+ hour session that was open for anyone to attend and offered as a way for members to provide insight and understanding to professional contacts in associated industries. The event was well attended with 60 registered attendees, a great number for Adelaide.

The attendees came from varied companies, such as Australia Shipbuilding Corporation, BHP Roxby Downs, NDE Solutions, QMS NDT & NACE, and APA group, as well as others with a diversity of professional backgrounds such as welding inspection, engineering, HR, and supporting roles and QHSE managers. The feedback received has been positive and complimentary of the training as worthwhile and comprehensive.

Afterward, Paul offered a second session where he discussed the changes to ISO 9712 and the AINDT Guide to Qualification and Certification. Paul's session covered the changes to training and certification hours, vision requirements, certification renewals, and recertification processes as well as some background as to what the drivers were at an international level that created the change. To end the session several examples were demonstrated around how a technician would use the points system to renew their certifications and I feel it cleared up a number of misconceptions as to the perceived difficulty around using the points process. It did highlight the importance of logging your hours when performing NDT testing and I could encourage anyone reading who is performing NDT to consider how they are going to do this so that renewal and recertification activities become easier.

The SA branch would like to thank Paul for his expertise and efforts over the two sessions, and greatly appreciate the time he spent on both.



Attendees at the Introduction to NDT tech night at the West Lakes Hotel.



Mr Paul Grosser talks to the tech night attendees.



The 4 + hour session was informative and comprehensive.



The other activity which has become the focus for the SA branch is the upcoming AGM and social evening. It will once again be held at the Adelaide Oval function rooms in July as a free event for members and their partners and has been an annual event on the SA calendar for several years now. It is a highly

enjoyable evening for all that attend and can only be the success that it is through the support of our friends in the industry that generously donate to the running of the night. Invitations for registration will be out soon so keep an eye on your inboxes and AINDT correspondence.

Vale "Timothy John Polinelli"



29th March 1967 to 14th May 2023

It is with great sadness that we inform you that Tim Polinelli passed away at home in Batam Indonesia, aged (56).

Tim suffered a massive brain aneurysm which ruptured in his skull, passing away instantly in his lounge room.

Tim started his career in NDT in 1991 with PNDD

Melbourne & later with Intico Melbourne, and worked on many pipeline projects in Australia for McConnell Dowell, Clough, NACAP, National Australian Pipelines, Saipem, McDermott. He was also employed at local fabrication shops in Melbourne & Tank Farms (MFL Inspection) Australia wide.

In 2000 Tim moved to Batam Indonesia where he set up "Steeltest Indonesia" which then after acquisition in 2005 became RTD Steeltest. He introduced many new advanced NDT Methods into the construction industry, in particular AUT & PAUT. He was excellent at what he did and very successful for the company winning many major projects for Construction of :- Topsides, Jackets, FSPO's, LNG Modules, Storage Tanks/Spheres/Bullets & Pipelines On/Offshore.

In 2007 he moved companies to UT Quality and subsequently setup UTQ Indonesia & UTQ Thailand, with over 100 employee's. Tim was a natural leader who stood by his team and encouraged success in all those he worked with.

He was dearly loved by his Indonesian employees & was a godparent to so many of their children and will be sadly missed by so many.

His funeral & cremation was held on the 19th May 2023 in Batam Indonesia. Rest in Peace mate, you will always be in our thoughts & prayers.

AQB Availability

AINDT examinations are available through a network of AINDT Authorised Qualifying Bodies (AQB's) as well as the two scheduled AINDT exam rounds.

AQB's are free to offer AINDT approved training and initial/recertification examinations in any Australian state at any time throughout the year. The scheduled AINDT examination rounds are conducted twice yearly (normally June and November) with dates being advertised in both the *The Industrial Eye* and the AINDT e-newsletter.

Whilst AINDT makes every effort to notify certificate holders of expiry of certification, it is the certificate holders responsibility to initiate the renewal & recertification process prior to expiry of certification (late fees apply to late certification applications).

Listed below are the AQB's for which AINDT has authorised to conduct AINDT examinations and the AINDT examination.

South Australia

Kuzer Technical

Contact: David Suede
Phone: 1300 199 086
Email: info@kuzer.com
Schedule: kuzer.com/schedule/

NDT Methods Levels 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

Victoria

ATTAR – AQB – Advanced Technology Testing and Research

Contact: Mark Welland
Phone: 03 9574 6144
Fax: 03 9574 6133
Email: training@attar.com.au

NDT Methods Levels Industry Sectors offered:

Computed & Digital Radiography 2, 3
Ultrasonic Testing 1,2,3 Welds, Casting, Wrought, Aerospace, Thickness
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 & 3 Ultrasonics 2 Multisector

Visual/Optical Testing 2 Multisector
Time of Flight Diffraction (TOFD) levels 2 & 3 Welds
Heat Treatment
ISO 9712 UT Level 2 Corrosion/Erosion
– Detection and Mapping (CDM)
Limited Certification

Western Australia

ALS Training Academy

Phone: 08 9232 0300
Email: trainingacademy@alsglobal.com

NDT Methods Levels Industry Sectors offered:

Ultrasonic Testing 1,2 Welds
Magnetic Particle Testing 1,2 Multisector
Penetrant Testing 1,2 Multisector
Phased Array Ultrasonic Testing 2 Multisector

ATTAR – Advanced Technology Testing and Research – Authorised Examination Centre

Contact: Mark Welland
Phone: 1300 139 155
Email: training@attar.com.au

NDT Methods Levels Industry Sectors offered:

Computed & Digital Radiography 2, 3
Ultrasonic Testing 1, 2,3 Welds, Casting, Wrought, Aerospace, Thickness
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 & 3 Ultrasonics 2 Multisector
Visual/Optical Testing 2 Multisector
Time of Flight Diffraction (TOFD) levels 2 & 3 Welds
Heat Treatment
ISO 9712 UT Level 2 Corrosion/Erosion
– Detection and Mapping (CDM)
Limited Certification

Queensland

ALS Training Academy – Authorised Examination Centre

Phone: 07 3816 5500

NDT Methods Levels Industry Sectors offered:

Ultrasonic Testing 1,2 Welds
Magnetic Particle Testing 1,2 Multisector
Penetrant Testing 1, 2 Multisector
Phased Array Ultrasonic Testing 2 Multisector

Condition Monitoring Training Centres

The below training providers offer training in one or more Condition Monitoring methods, categories and industry sectors.

This training program has received approval from the AINDT as it aligns with the national syllabi as endorsed by the AINDT Certification Board.

To ensure comprehensive understanding, learners are advised to obtain a copy of the training module (syllabus) from either the training body, or by downloading from the AINDT website, when undertaking training in an CM method or industry sector module.

For Certification applicants, it is mandatory to successfully complete the training program and training hours as specified in ISO18436 to fulfil the corresponding CM Method, Category and Industry Sector.

All examinations are administered by the AINDT. For examination dates and other pertinent information, please reach out to the federal office.

CM Training Centre Locations:

Victoria

University of Melbourne

Parkville
Victoria 3010
Phone: +61 3 9810 3348
Contact Email: claudine.evans@unimelb.edu.au

Industrial Precision Instruments

Unit 12, 634-644 Mitcham Rd Vermont
Victoria 3133
Phone: +1300781701
Email: training@ipi-inst.com.au

SKF Reliability System

SKF Australia Pty Ltd
17-21 Stamford Rd
Oakleigh, Victoria 3166
Phone: +61 3 9269 0763
Contact Email: laszlo.Csernatony@skf.com

Wood – Asset Performance Optimisation

Level 3, 171 Collins Street
Melbourne, Victoria 3000
Phone: (08) 6314 2000 / (08) 6314 2280
Email: svt.bu.training@woodplc.com

Western Australia

ALS Training Academy

109 Bannister Road, Canning Vale
Western Australia 6155
Phone: 08 9232 0300
Email: trainingacademy@alsglobal.com

Wood – Asset Performance Optimisation

Level 1, 240 St Georges Terrace
Perth, Western Australia 6000
Phone: (08) 6314 2000 / (08) 6314 2280
Email: svt.bu.training@woodplc.com

Queensland

Advanced Infrared Resources Australia AIRA

PO Box 372 Hervey Bay
Queensland 4655
Phone: 0467 565 836
Email: jeff@irtau.com.au

ALS Training Academy

7 Brisbane Road Riverview
Queensland 4303
Phone: 07 3816 5500
Email: trainingacademy@alsglobal.com

Wood – Asset Performance Optimisation

Level 20, 127 Creek St
Brisbane, Queensland 4000
Phone: (08) 6314 2000 / (08) 6314 2280
Email: svt.bu.training@woodplc.com

100

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#68

Informing members on industry changes and new standards and their impact on the industry.



Benefits of AINDT Membership

Why should you become a member?

Regardless of whether you are an independent inspector or a multinational NDT service provider, we offer membership options tailored to your specific needs. Selecting the right package is crucial and depends on what you seek to gain from your membership, such as:

- Connecting with industry peers and accessing valuable resources and information.
- Enhancing your industry's visibility and earning recognition.
- Advancing your professional development and receiving technical support.
- Enjoying discounts and exclusive access to various events, seminars, workshops, and conferences.

Who is AINDT?

AINDT, the Australian Institute for Non-Destructive Testing, is the leading organisation responsible for the Non-Destructive Testing (NDT) and Condition Monitoring (CM) industry in Australia. Established over 50 years ago as the Non-Destructive Testing Association of Australia, our main objective is to advocate for the industry and its members while promoting the professional practices of NDT and CM.

Be an industry advocate!

As the representative body for NDT and CM professionals throughout Australia, we are dedicated to shaping the industry for your direct benefit and that of your business. With branches in various states and a central office in Melbourne, our goal is to facilitate networking and communication among members, as well as with all levels of government.

The benefits of membership

By joining our professional institute, you signal your commitment to the industry and demonstrate your status as a business professional with valuable skills. We offer several membership packages to cater to different needs:

Industry Connection (Individual, Student & Retired Members)

- Stay connected to your industry with exclusive benefits:
- Receive 6 editions of the Industrial Eye (AINDT Journal)
- Enjoy substantial savings on certification, renewals, and re-certification fees
- Network with industry professionals at AINDT Branch social events

- Utilise the AINDT Membership and Certification online Portal
- Take advantage of discounted registration fees and professional development opportunities at AINDT conferences, workshops, and seminars
- Participate actively in your local state branch
- Qualify for examination opportunities and industry service awards

Business Development (Company Member): Ideal for small companies looking to expand their business. It includes all individual member benefits, one nominated representative, free advertising in the AINDT online Technical Experts Directory, free job postings on the AINDT website, discounts on website and online advertising, and personal assistance in maximising membership benefits.

Reputation Building (Corporate Member): Suited for companies seeking increased industry exposure and support. It encompasses all company member benefits, three nominated representatives, off-site direct technical support, staff certification control with expiration/renewal notifications, on-site technical consultation and support on a cost-rate basis, and access to sample test plates for staff training.

Leadership, Influence & Representation (Supporting Member): Designed for national and multinational companies desiring representation in the Australian NDT and CM Industry, along with associated bodies. This package includes all corporate member benefits, four nominated representatives, one day of on-site consulting per financial year with the CEO, up to 52 hours per financial year of free off-site technical support with AINDT through direct contact with the CEO, exclusive conference seminar papers and exhibition discounts at AINDT events, and consultation on new standards (ISO and Australian).

Leadership, Influence (Sustaining Member): Intended for respected multi-state and multinational companies seeking enhanced control, support, and benefits for their brand. This package offers complete sustaining member benefits, five nominated representatives, on-site technical consultation and support, off-site direct technical support, a complimentary copy of the Federal Council meeting minutes sent to nominated representatives, and exclusive discounts on individual membership prices for company employees. Additionally, it provides pre-advice on new standards.

Please visit www.aindt.com.au for further details and terms and conditions.



AINDT

MEMBERSHIP RENEWAL 2023-2024



IT'S THAT TIME OF YEAR!

Renewing your membership will:

- Ensure you keep benefiting from substantial reductions on Certification expenses.

To qualify for discounts on Renewal and Recertification application fees, as well as related expenses, a member needs to maintain uninterrupted membership for a period of 5 years.

- Receive 6 editions of the AINDT Journal, Industrial Eye.
- Access the AINDT Membership and Certification online portal.
- Be eligible for examination and industry service awards.
- For those seeking industry connectivity:
 - Connect with professionals at AINDT Branch social events.
 - Benefit from discounted registration fees and professional development opportunities at AINDT conferences, workshops, and seminars.
 - Qualify to actively participate in your local State Branch.

RENEW TODAY!

<https://portal.cbdb.aindt.org/login.php>

Member Profile: Shaina Johnson



Shaina Johnson

How many years have you worked in the NDT Industry?

It would be nearing 6 years now.

I began in the cool part of Alberta, Canada mainly doing radiography with the Oil & Gas.

Why did you choose a career in NDT?

Like everyone i believe, it approached me. I have always

had an interest in the metallurgical side of things so when I came across NDT my interest definitely peaked! And of course I really enjoy it. There are so many possible avenues you can venture down to keep it interesting.

Briefly describe your current role?

I have recently moved from QLD as a technician to join ATTAR in Melbourne to become a trainee Trainer. At the moment my subjects are Radiation Safety, Materials & Technology, MT2 and PT2. Creating ways for new students to become engaged and enable themselves to create the same passion I have for this industry.

How do you see the industry evolving over the next 10 years?

Change is inevitable. I sense over the next 10 years there will be some new computer interface type changes but the fundamentals of NDT will not change. Digital radiography is enabling a more environmental advantage with no use of chemicals and the use of drones for visual testing are becoming more advanced.

Can you share with us a career highlight?

It would definitely have to be working over in Canada. Learning to carry bear spray with me, rather than

wearing DAP certainly gets the blood pumping! Working in such a picturesque place never really felt like a hard day's work until the snow came knee deep and it was -50 degrees Celsius! Somehow though between my frozen neck gaiter and eyelashes I still managed to defrost a cheesy grin thinking how insanely incredible this experience was.

Do you have any advice for people new to the industry?

Make yourself available to the endless opportunities brought forward to you.

Ask questions! There's always something new to learn.

Involve yourself with conferences, technical nights and branch meetings. Having that extra mentorship can help build your knowledge and experience.

What is the best piece of advice you have ever received?

A difficult one to narrow down. Throughout the years I have received many great pieces of advice that were perfect for my situation in that moment.

Something I have always remembered was to achieve maximum knowledge & skills in becoming a successful person, making every moment matter & sustaining happiness in each day.

Below is a quote I do adore;

What lies behind us, and what lies before us are but tiny matters compared to what lies within us. And when we bring what lies within us out into the world, miracles happen.—Henry Stanley Haskins—

What are the top 3 things on your bucket list?

- To continue travelling the world
- Hike up Machu Picchu
- Bungee Jump in New Zealand
- Own a log cabin in the mountains

100

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#67 Input into the development of Australian Standards.



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3-7 JULY 2023 | LISBON

3-7 JULY 2023 | LISBON
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ON NON-DESTRUCTIVE
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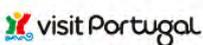
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NDT World Event Calendar 2023/2024

The following list offers information on upcoming international NDT conferences for your consideration:

June 6 – 8, 2023

**The 10th edition of the Cofrend Days
Presentation Cofrend2020 – Non Destructive
Testing (cofrend2023.com)
Marseille – Palais Chanot**

Organised by the French Confederation for Non-Destructive Testing, this conference offers a unique program of highlights, to effectively link exhibitors, researchers, scientists and visitors around Non Destructive Testing. An Open Day on June 7th, dedicated to the students from the Region of Marseille, to discover the NDT profession.

A strong, diversified, advanced, world-ranking industrial presence

Aerospace – naval construction and repair – renewable energy – nuclear – oil and chemistry – iron and steel industry – railway transport.

Openness and access to information and technology are a priority in terms of innovation and technological advances. They must make it possible to apply the latest techniques to offer better services in inspections and non-destructive testing.

The scientific program, made up of approximately 160 scientific and technical conferences, led by quality speakers in terms of expertise, will allow participants to discuss around:

- New industrial applications of NDT methods;
- Feedback from industry
- Research and development

Poster sessions will allow young PhD students to present their thesis subject to scientists and industrialists. Note, the awarding of the COFREND Prize, to 3 winners, on the criteria of the Jury, and the celebration of the Prize during the Gala evening.

Also, every afternoon at the opening of the technical program, there will be scientific plenary conferences.

- highlighting technological evolution and presenting new possibilities and applications of the various NDE methods in industrial domains through technical conferences and an exhibition
- fostering thoughts on the new industrial challenges of NDE in face of imperatives in terms of competence, employment, and promotion of the inspector's profession through specific debates and « Open Days » centred on training and on the professional career path.

July 3 – 7, 2023

**13th European Conference on Non-Destructive
Testing (ECNDT 2023).
ECNDT2023
Centro de Congressos de Lisboa (CCL), Lisbon,
Portugal.**

The next European Conference, the 13th in the series, organised by RELACRE, the Portuguese Association of Laboratory Accreditation, is to be held in Lisbon, Portugal.

The European Conference on Non-Destructive Testing (ECNDT) is considered the major international event for EFNDT and its member societies. The event shows the importance of this economic sector and the diversity of its activity and competence to ensure Safety, joining all the community of NDT (Academia, Inspection Companies, Accredited Laboratories, Industry, and Suppliers of Equipment). It is the perfect opportunity for networking and to get in touch with the state-of-art of research and innovation and to meet the developments of equipment provided by the European and World NDT Community.

The conference includes a technical and scientific programme which presents the latest developments in the field of research and development as well as the application of NDT in all major industrial areas. The exhibition organised in conjunction with the conference emphasises the close link between research and development, and the equipment and instruments used by industry.

The conference and the exhibition are combined the best promotion of NDT and at the same time offer unique opportunities to establish contacts and exchange experience and ideas between participants and visitors

September 12 – 14, 2023

**19th International Conference on Condition
Monitoring and Asset Management CM 2023
About the conference (bindt.org)**

The British Institute of Non-Destructive Testing (BINDT) is pleased to invite you to this premier event, the Nineteenth International Conference on Condition Monitoring and Asset Management (CM 2023), which will be co-located with NDT 2023 to celebrate the 60th Annual British Conference on NDT. To find out more about NDT 2023, click here.

The conference is being organised by BINDT in close partnership with the International Society for

Condition Monitoring (ISCM) and the US Society for Machinery Failure Prevention Technology (MFPT). This combination of the efforts of these leading organisations creates one of the largest events of its kind at a truly international level and builds on the highly successful 18 international condition monitoring (CM) conferences organised by BINDT, the First World Congress on CM in 2017 organised by BINDT and ISCM and 71 annual conferences organised by the MFPT Society.

BINDT has always recognised the importance of encouraging students to participate in this major international event. As a gesture to celebrate the nineteenth international conference, the Institute will be providing sponsorship of student registrations in 2023, resulting in a reduction of fees for student attendance.

October 23 – 26, 2023
ASNT 2023 ANNUAL CONFERENCE
ASNT 2023 (eventsair.com)
Marriott Marquis & George R. Brown
Convention Centre
Houston, Texas, USA

"EVOLUTION"

The NDT world is evolving at a rapid pace. From advances in technology, to artificial intelligence and machine learning, to an everchanging workforce, NDT continues to evolve. ASNT 2023: The Annual Conference is a reflection of this evolution. Save the date and make plans to join us in Houston, Texas. Call for presentations is now open. Click here to present.

ASNT 2023 is the place to mingle with more than 2,000 NDT industry professionals and hear industry experts present high-quality, innovative content. The conference will feature exciting general sessions and time to connect with your peers, plus a vibrant exhibit hall with over 225 exhibitors. ASNT 2023 is the best opportunity to share your research/work, hear updates on the latest NDT advances, network with your colleagues and meet new ones.

27–31 May, 2024
The 20th World Conference on Non-Destructive Testing (20th WCNDT)
20th WCNDT
Songdo Convensia, Incheon, Korea

It is our great honour to invite you to attend the 20th World Conference on Non-Destructive Testing (20th WCNDT) hosted by the Korean Society for Non-destructive Testing (KSNT) to be held in Incheon, South Korea in May 2024 under the auspice of ICNDT.

The Organising Committee will offer a dynamic technical program that will be highly informative for every participant. The conference will be the place to interchange and integrate of professional colleagues from all around the world with an interest in this field.

The venue, Songdo Convensia, Incheon, is a centre of trade and transportation built upon the advanced infrastructure of Incheon International Airport (IATA: ICN). Within an hour's distance from Seoul by public transportation, visitors will be given the opportunity to experience a mix of diverse cultures and world-class urban life.

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AICIP lobby's for Sovereign National Qualifications

The recent shift in legislation, replacing the need for specific qualifications with a broader term, "competent person," has stirred considerable concern within the pressure equipment industry.

Industry stakeholders fear this might open the door for international qualifications to supersede sovereign national qualifications such as AICIP, creating potential for inconsistencies and jeopardising quality assurance. This was seen in the recent public comment stage for DR AS3788 Pressure Equipment where the AICIP office had many concerns regarding no reference to AICIP Inspector Certification.

The Board of AICIP share the concern with no mention of AICIP for consideration as input into the decision process for competent persons. We also note they have not listed any other globally accepted certifications either.

The reason is that AICIP, API, ASME, CSWIP are all "in-house" schemes that are not based against a prescribed Australian or International Standard. When you look to the draft for how they consider NDT and weld inspection they refer to ISO9712 for NDT and ISO1796 for Weld Inspection/Supervision and not ASNT TC1A or CSWIP 3.1 or AWA CWI etc, again as they are in-house programs, albeit highly recognised.

AICIP is disappointed not to be mentioned but this is driven by the rules of Standards Australia, and we are thankful that the international schemes are also not listed or aligned to an international standard. Our understanding is that no amount of commenting on this topic will change the outcome as the reasoning is policy driven and not a subjective driven change.

AICIP now being aware of this, wishes to align our certification more closely with MP 76 and push to have this "miscellaneous publication - MP" published. This will ensure that AICIP could be included in future revisions. The reason MP76 is a "miscellaneous publication" and not a standard is that at the time the States and Territories could not agree on the content, so it couldn't be published as a standard.

Sovereign national qualifications provide several key benefits that are worth emphasising. Firstly, they are tailored to fit the unique characteristics and specific requirements of the national industry. These qualifications are built upon the local rules, regulations,

and industry practices, thereby ensuring a thorough understanding of the domestic landscape. This could be particularly beneficial in an industry such as the pressure equipment industry as we have our own suite of pressure equipment standards that international schemes do not examine on.

Secondly, national qualifications often result in a more streamlined, efficient communication between regulators, inspectors, and the industry at large. Professionals with these qualifications speak the same 'language', reducing misinterpretations and misunderstandings that could lead to potential safety risks.

Thirdly, sovereign national qualifications provide greater oversight and quality assurance. With these qualifications, the industry can maintain direct control over the training, testing, and qualification process, ensuring that all inspectors meet the exact standards required. In contrast, international qualifications, while they may offer a broader perspective, lack this direct oversight, creating potential inconsistencies in the level of competency.

Lastly, retaining a focus on national qualifications can support domestic education and training institutions, contributing to the local economy and ensuring a sustainable pipeline of qualified professionals. While international qualifications may offer a diversity of knowledge, they may not necessarily align with the specific needs of the national industry.

AICIP hopes to have the first in-service inspection of pressure equipment scheme aligned to a published standard so that future editions of AS3788 will mention AICIP.



Standards Report by Angelo Zaccari Chairperson MT007

The MT007 Standards continue with our project manager continue to be active on many Standards and bring new revisions to the industry.

In the last quarter these include new revision of Draft ISO Standards with a confirming vote and submitted as our position as follows

- ISO/TS 11774 (version 3): Non-destructive testing — Performance-based qualification
- ISO/DIS 24489: Non-destructive testing — Acoustic emission testing — Detection of corrosion at atmospheric and low-pressure metallic storage tank floors.
- ISO/CD 18081: Non-destructive testing — Acoustic emission testing (AT) — Leak detection by means of acoustic emission.

These confirmations is MT007's view on these Standards and does not necessarily mean that these Standards will be carried in Australia.

Further ballots were held for current ISO Standards currently being prepared by ISO Committees which includes.

- ISO 19835:2018: Non-destructive testing — Acoustic emission testing — Steel structures of overhead travelling cranes and portal bridge cranes.

Our new MT007 Member David Padfield has contributed greatly with Acoustic Emission ISO Standards that have been brought to MT007.

Since MT-007 is a participating member of ISO TC 135/SC 7 (Personal Qualification) & ISO TC 135/SC 8 (Thermographic Testing) and observes ISO/TC 135 (NDT General) & ISO/TC 135/SC 9 (Acoustic Emission), we will have MT007 representation in this case by Keith Arcus in Lisboa Portugal to be held during July 2023.

We will be seeking further memberships this year across all ISO Committees and are optimistic in the acceptance of MT007 membership submissions.

Currently there are a number of public ballots open that can be found on the Standards Australia web site.

These ballots are open due to these ISO Standards being the latest revisions in circulation and include.

- AS/NZS ISO 9712:2023 Non-destructive testing — Qualification and certification of NDT personnel. Ballot End
- AS/NZS ISO 3452.2:2023 Non-destructive testing — Penetrant testing, Part 2: Testing of penetrant materials.
- AS/NZS ISO 3452.1:2023 Non-destructive testing — Penetrant testing, Part 1: General principles

The end date for comments on all the above Standards is 12/06/2023.

As indicated in the previous Standards News, to view and make comment on these Standards, you can register on the Standards Australia portal by following the below link.

www.standards.org.au/news/standards-australia's-new-public-comment-platform-launched

With normally reporting on AS and ISO Standards, I take the opportunity to remind everyone that new additions and enhancements have been made to a number of BPVC – ASME Boiler and Pressure Vessel Code. These changes are related to Sections X, II, V, IX and XIII and further information can be found on the ASME web site link.

www.asme.org/codes-standards/bpvc-standards/bpvc-2023

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

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

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Thermography in Action

Welcome to *Industrial Eye's* regular feature on infrared thermal images from the Australian Professional Thermography Association. (AUSPTA). Every infrared image tells a story. These images and information are presented as brief snapshots to show examples of thermography in action in the real world.

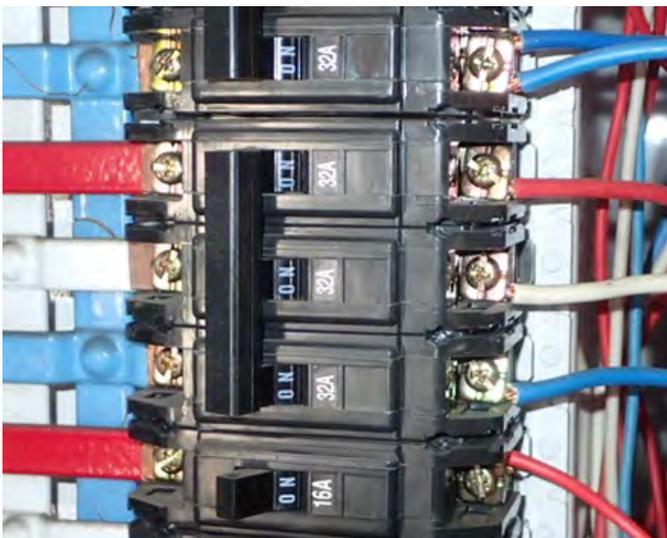
Thermal Analysis of a 3 phase Circuit Breaker under load

AUTHOR: ERIK THORUP, TECHNICAL SUPPORT, COMMITTEE OF MANAGEMENT, AUSPTA CATEGORY 3 THERMOGRAPHER, ELECTRICAL/MECHANICAL (AINDT/BINDT)

Applying Thermography to Condition Monitoring relies on finding warm or cold anomalies. Then analysing these to determine whether they are due to normal operation of the plant or, if needs be, to further investigate to establish if they are the result of faulty conditions, which may eventually lead to failure. In this case we will look at the thermal pattern on an electrical 3 phase 32Amp circuit breaker of TERASAKI Safe-T brand, running a heater.

Here we will be exploring 3 points:

1. What impact does load have on the breaker temperature and pattern.
2. Impact on measurement when finding the actual source of the heat.
3. Visual impact between Histogram Equalised and Linear Temperature mode.
3. Visual impact between Histogram Equalised and Linear Temperature mode.



3 phase 32Amp circuit breaker of TERASAKI Safe-T brand

Opposite page are the images taken on site in March 2023, using the FLIR T660 camera with normal 24° lens

and 640x480 resolution. The Emissivity was set at 1.00 and an attempt was made to get the best focus possible.

An image was taken of the panel with the escutcheon on. As it can be seen, there is an indication of an anomaly, but you need to get direct line of sight access to the components inside to be able to assess if there is a problem.

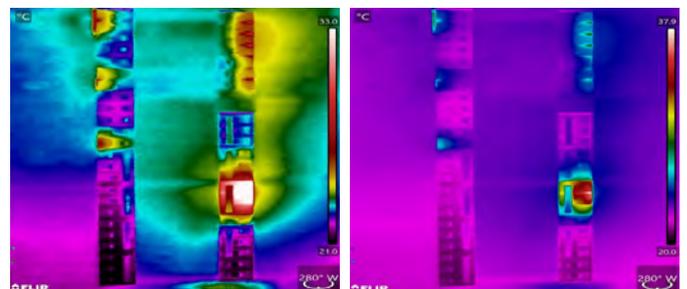
Conclusion

Load on CBs will increase the temperature of the CB due to the internal trip mechanism heating up, usually a bimetallic strip. The increase in temperature (Delta-T) should follow the square of the load (I²), so the closer to the rated current a breaker gets, the higher increase would be expected (exponential rise).

The temperatures measured in this test however showed an almost direct linear relationship between the load and the temperature increase from ambient. However, we did NOT look directly at the bimetallic strip, and it is possible the 3-dimensional heat flow from the trip mechanism increases the surrounding moulded CB casing at a linear rate.

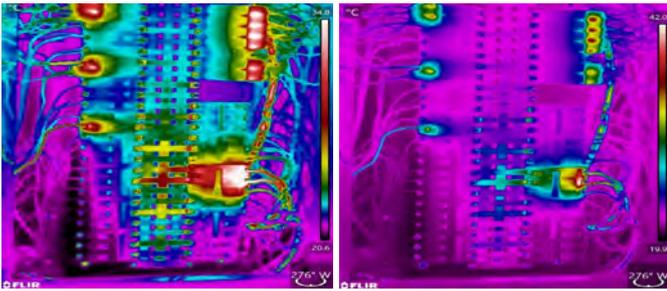
All images in this column are in Histogram Equalised (HE) setting as seen by the camera when running in Automatic mode.

All images in this column are in Temperature Linear (TL) setting, manual mode. Temperatures are thermally tuned.



1. Thermal image of a switch panel with the escutcheon left on. The image is left in the Histogram Equalised format which can be seen by the non-linear distribution of the rainbow colours in the palette above right.

The same image has been changed to Temperature Linear format – manually adjusted to the minimum and maximum “temperature” in the image. Max is 37.6°C



2. Escutcheon removed and in HE mode. A lot of “white” spots suggest max temperatures around 35°C – but max is 42°C. Most of the white spots are normal thermal signatures from RCBO’s.

Escutcheon removed and in TL mode of the same image. Warmest area at the 3 phase CB towards the bottom right side in the panel. Max is 41.8°C

Load impact on measurement

For the Circuit Breaker surveyed it was found that the temperature measurements rise almost linearly with the load. We did NOT have direct measurement of the bimetallic strip inside the CB. The actual temperature of the thermal trip mechanism could not be established. What we measure at the outside casing of the CB is not the maximum temperature inside the CB.

However, we can see that increase in load causes an increase in temperature, it is almost linear and in ambient of 21°C this particular CB shows to get up to 53°C at 31A with the CB rated at 32A.

Temperature measurement increase due to image composition

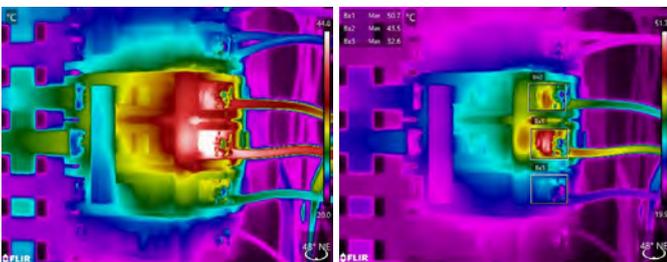
As we work our way closer to the source of the heat, we see that we go from 37.6°C with the escutcheon still on, to 41.8°C when the escutcheon is removed, to 50.7°C when looking closely at the CB ending up with 53.3°C at the warmest point on the casing.

Histogram Versus Linear Temperature

On April 12, 2023, FLIR made a Camera software update which allows for some of their newer cameras to be run in either Histogram Equalised or Signal Linear display when in automatic mode. The images above are shown in each mode. Older cameras will only operate in HE display setting when in automatic mode.

It may not be obvious, but in image 2 with the escutcheon removed, the colour distribution suggests that the highest temperature at the 3 phase CB is similar to the temperature of the RCBOs and probably not an anomaly. The Linear image does show the 3 phase CB being warmer and shows more definition of the hottest area. This does suggest that it may be faster to find and separate anomalies in Linear mode.

Thermographers should be aware of the difference between the 2 modes and know which one they are working with in the field.

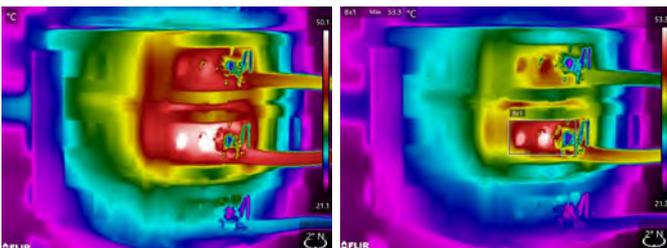


3. The component of interest is the 3 phase Circuit breaker is rated at 32A and here seen in HE mode.

The same CB in TL mode – with area max measurement at each phase. Max is 50.7°C

Fault no fault?

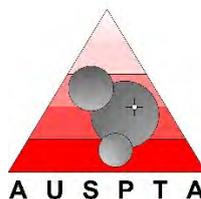
In this case the thermal anomaly is purely due to the difference in the load on the 3 phases on the CB, as well as the size of the load which is close to the rating on the white phase. This is not a fault as such since the temperatures are in accordance with the component design and the actual load, but the load unbalance may suggest some heating elements may have blown, and the unbalance should be investigated.



Close up of the position of the hottest part of the CB which was found to be internally in the CB. Image in HE mode.

The same area in TL mode – with area max measurement. Max is 53.3°C

The ambient temperature at the panel was found to be 21°C. The CB was running a 3 phase heater and the load was measured on each phase. Top red phase load was 23A and internal temperature was measured at 45°C. Middle white phase was 31A and internal temperature was measured at 53°C. Bottom blue phase was 12A and internal temperature was measured at 33°C. Temperature measurements were taken from the bottom image.



Reliable and Dynamic Condition Monitoring for load-bearing building structures

PC and EtherCAT-based control technology for monitoring solution implemented in shell construction.

Load-bearing structures of bridges, high-rise buildings and other buildings are permanently subject to weather influences such as rain, snow and wind up to hurricane force or, at times, extreme events such as earthquakes. With increasing age, the static condition of buildings, especially in tectonically active regions, should therefore be carefully monitored, and it's even better if the necessary monitoring technology has already been thought of in the shell construction. Italian construction company Manini Prefabbricati SpA has developed an active monitoring system for load-bearing structures that uses PC-based control from Beckhoff.

When natural events of above-average magnitude (earthquakes, heavy and sudden rain, wind and snow) affect buildings, the resulting high dynamic loads change the stresses in the structural members. This has a more or less permanent effect on the structural properties and nominal life of a structure. The Italian Ministry of Infrastructure and Transport takes this into account in its structural standard NTC 18, raising awareness of the need for greater protection and monitoring of new building structures.

Manini Prefabbricati SpA in Assisi (PG), together with the Institute of Civil and Environmental Engineering of the University of Perugia and the system integrator Umbra Control Srl, has developed an innovative monitoring solution for this purpose: Manini Connect is able to determine in real time whether the functionality and stability of a structure are in accordance with the design parameters. That is, dynamic structural monitoring makes it possible to evaluate the structural behaviour of the building and thus also its stability. With the automated processing system, anomalies in the behaviour of a structure after exceptional events can be detected immediately. In this way, the dynamic structural monitoring function helps to specifically evaluate the structural behaviour of buildings.

The data from the Manini Connect condition monitoring systems converge in the monitoring center, but can also be accessed via cloud, tablet and smartphone thanks to the open automation architecture and PC-based control.

Real-time data acquisition provided from the start

The condition monitoring system is based on PC-based control from Beckhoff, EtherCAT for connecting the sensor technology, and an algorithm developed at the University of Perugia for managing the assessment criteria for earthquakes, the so-called seismic factor. Umbra Control is responsible for the implementation, from the design of the system architecture to the commissioning and maintenance of the cloud-based platform.

Already during production, the sensor technology of Manini Connect is integrated into the supporting concrete structures of a building and, after completion of the building, connected to the control cabinet for data evaluation and transmission to the monitoring centre. Various sensors record the external and internal thermohydrometric properties of the building as well as their changes during dynamic loading.

Special algorithms evaluate the signals and send early warnings or, if necessary, an alarm to the Manini Prefabbricati control centre after special events such as an earthquake.

Since all sensor signals are sent to the control centre in high resolution, the structural behaviour of the structure can be monitored from there in real time. The corresponding software was developed by Umbra Control. It is used to manage all data and information and to control the installed sensor technology. If required, the installed sensors of an object can be checked, activated or deactivated – not only locally in the control room, but also via tablet and smartphone.

Robust industrial solution chosen as backbone

Umbra Control uses CX8190 Embedded PCs as control hardware and EtherCAT as communication backbone for



Manini Connect. With the Embedded PCs and the open software architecture, the system integrator says it builds an optimal bridge between the sensor technology in the field and the cloud-based monitoring platform, with the Beckhoff automation software TwinCAT providing the foundation through its openness: data acquisition runs in real time in the TwinCAT Runtime and thus separately from downstream data transmission, processing and storage via the control centre.

The use of EtherCAT as a powerful communication technology result in a maximally flexible and modularisable monitoring system, as the experts from Umbra Control explain: Regardless of topology changes or network expansions, the process image does not show any significant fluctuations with regard to the update time. The implemented solution can therefore be scaled as required, depending on the project, without having to adapt the monitoring system.

EtherCAT also ensures synchronisation of the sensor data acquired in the field and simple integration of the various sensors connected via EtherCAT Box modules. With their high IP67 protection rating and the wide operating temperature range from $-25\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$, the fully encapsulated I/O modules of the EP series also

have no difficulty to withstand the often-harsh operating conditions. Furthermore, the wide range of modules supports the integration of even special sensor signals, e.g., from the acceleration and inclination sensors that are already cast in during the concreting of the load-bearing structures.

The CX8190 Embedded PCs record both ambient conditions (temperature, wind strength and direction, humidity) and mechanical variables, correlate all acquired values and use them to detect emergency situations. PC-based control enables sufficiently fast sampling of the mechanical quantities to reconstruct the effects that a structure may have suffered after a seismic event using specific algorithms. Last but not least, the fact that Manini Connect was designed with proven industrial components ensures easy diagnostics, product interoperability through the use of standard protocols and long system life.

Efficiency, safety and continuous prevention

With Manini Connect, the structural behaviour of the building can be interpreted in relation to the various external influencing factors. The monitoring system enables predictive maintenance according to the principles of intelligent building management. The aim is to maintain the functionality and stability of a building over its entire service life. Monitoring for anomalies reveals previously hidden signs of aging in good time and allows maintenance measures to be initiated long before the stability is endangered. PC-based control as an open control system ensures low installation costs and significantly reduced insurance premiums.

Condition Monitoring Strategies for Maintenance and Manufacturing Optimisation

Similar to business models, which are frequently assessed to improve their strategy, modern maintenance organisations are constantly evaluating their processes.

SOURCE: RELIABLE PLANT DIGITAL MAGAZINE MAY 23
WWW.RELIABLEPLANT.COM/READ/32342/CONDITION-MONITORING-STRATEGIES-MAINTENANCE-OPTIMIZATION
 AUTHOR: ALEX OLIVEIRA

This not only avoids negative business consequences, but eliminates the potential risk to people, the environment, and the products that are deeply impacted by equipment reliability.

With regard to asset reliability, failure anticipation through the applications of technologies and strategies, such as condition monitoring, are growing considerably. They not only avoid downtime based on the component's trending health data, but they also use smart data to support complex decisions that contribute to manufacturing improvements and the extension of asset life.

Condition Monitoring and Artificial Intelligence

Condition-Based Maintenance has been gaining considerable space in the last few years. In some industries, such as automotive or chemical, many maintenance intervention decisions are already automated using **Artificial Intelligence** (AI) algorithms that operate at process controllers and maintenance systems databases. These algorithms can define the maintenance services' triggers, as well as their scope.

Manufacturing floor issues can also be anticipated by analysing process patterns using asset condition monitoring figures. For example, a viscosity deviation problem can be avoided if vibration analysis data is used to detect pump cavitation.

Condition monitoring applications are also expanding in manufacturing. For instance, a critical process parameter, such as viscosity, may start to trend abnormally when influenced by an evolving bearing failure mode. But, appropriate vibration analysis, paired with oil analyses, can anticipate this failure before production losses occur.

However, while these predictive techniques, cross-referenced with process parameters, can be integrated to automatically identify abnormal patterns, these AI algorithms should be tested and validated against stringent criteria, such as Good Manufacturing Practices



(GMP). Many maintenance and engineering departments choose to initially develop their AI projects in the utilities area, and once successful, they then deploy these concepts in the production area.

TBM to CBM Transition

The idea of progressively replacing Time-Based Maintenance (TBM) with Condition-Based Maintenance (CBM) isn't new. In fact, because of its vast list of benefits, the TBM to CBM transition has been promoted by engineering consultants for decades. But CBM adoption with a supporting strategy doesn't empower higher reliability.

Time-Based Maintenance

Planned maintenance alerts used in predictive and preventive maintenance that are triggered based on a set schedule or time interval.

This concept is similar to the maintenance of human health. More frequent tests, such as blood or temperature measurements, performed during a short timeframe won't considerably improve the medical assessment's accuracy. But, performing other tests that combine to provide a broader account of our current health can give physicians insights that help identify and proactively treat health issues as they develop.

Likewise, with asset health, by integrating the right combination of techniques and digital tools to support data analysis, we can develop a more encompassing assessment of our equipment. Rather than investing

in time-based changes (such as increased inspection frequency), the right digitally optimised condition monitoring practices can more accurately avoid critical asset and process failures.

With Digital Transformation programs benefiting from digitally modified engineering tools enhanced by analytics and statistical capabilities, companies are investing more in failure mode analysis.

For example, by using this data, which is stored digitally in an integrated database, risk assessments as **Failure Modes and Effects Analyses** (FMEA) can be changed into Failure Modes, Effects, and Criticality Analyses (FMECA). This enhances the criticality analysis with statistical calculations based on factors such as sensor recordings, hardware maintenance history records, and calibration logs. Modern reliability engineering has benefited from introducing these analytics tools and relevant amount of smart data, now digitally available, which helps to assess patterns associated with failures and propose more accurate solutions that avoid failure recurrence.

Vibration Analysis and Lubrication Partnership

Among the vast list of maintenance techniques that help avoid mechanical failures, some combined applications bring the best of both worlds – diagnosis and prevention. In the context of anticipating equipment failures using smart data, let's explore one of the most effective reliability prediction partnerships – vibration analyses and lubrication.

While lubrication mostly targets failure prevention by reducing wear in rotating elements, vibration analysis integrates with the diagnosis to anticipate unplanned equipment downtime.

Did You Know?

The condition monitoring market is expected to reach \$4 billion by 2027, and vibration monitoring technologies are expected to account for the largest market share during that forecast period.

Source: [Markets and Markets](#)

With vibration analysis, good Root Cause Analyses (RCA) can be performed to successfully create a service plan. This allows for the creation of a scheduling window that can be deployed to minimise production disruption. It can also be combined with additional lubrication practices to decelerate the rate of damage until the repair can be performed.

It's worth mentioning that to experience the mentioned benefits, a good lubrication program appropriately applies the lubrication materials, such as oil or grease, in its appropriate amount and at a suitable frequency.

Condition Monitoring and Sustainability Applications

The energy-intensive processes of many industries have a significant carbon footprint impact. As a reaction, from facility design to carbon offset projects, companies are revisiting their emissions targets and investing in more sustainable operations.

With this mindset, the right combination of **condition monitoring strategies** can contribute to sustainable initiatives and help determine the exact causes of impending failures that would have a negative environmental impact.

Previously, environmental factors weren't considered; maintenance prevention investments were assessed mostly for budget purposes and were based off Return on Investments (ROIs) that compared the cost of the investment with the cost of the downtime and the required repairs.

Today, however, other intangible cost-avoidances associated with carbon footprint size are entering the equation. For example, acoustic imaging used to detect gas pipeline leaks not only reduces carbon footprints by preventing the excessive energy consumption that would be required to compensate for the system's volume and pressure decay, but also avoids the emission of contaminants into the atmosphere.

Ultrasonic and thermography also strongly supports the detection of leaks at steam traps, which not only demands expenses for repairs, but also consumes excessive environmental resources to generate enough energy to counteract the steam loss.

In this way, the combined processing and analysing of manufacturing data (pressure, flow, temperature) with the maintenance history can contribute to more effective solutions for avoiding faults that can compromise the asset and create harmful environmental outcomes.

Conclusion

Companies are constantly evolving their asset management strategies to be more efficient, avoid losses due to downtime, and eliminate environmental risks by employing modern methods and techniques, such as condition monitoring, in partnership with digital engineering tools.

Combining predictive maintenance techniques, such as vibration and oil analysis or ultrasonic and thermography, can not only avoid downtime, but contribute to manufacturing improvements, especially when using smart data to empower the asset management and process optimisation decision-making process.

Strategies focused on the synergy between machine data and manufacturing parameters can foster more sophisticated and in-depth analysis of equipment and process failure modes, positively revolutionising asset cost management and exponentially improving the ability to predict process problems.

References

¹Data-Driven Predictive Analytics Can Transform Plant Engineering, June 2016 edition of Manufacturing Engineering magazine.

²IEC 62740:2015 describes the basic principles of root cause analysis (RCA) and specifies the steps that a process for RCA should include.

Introduction to Industrial Vibration Analysis

Why VA? VA, which stands for Vibration Analysis, is used for fault detection by understanding why, when, and how vibrations occur, exploring the various applications of VA, acquiring the necessary data, and following important steps in analysing the data, all while examining real data examples.

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Why and when?

Different types of maintenance exist for rotating equipment, including reactive maintenance, which involves running the equipment until failure occurs. This approach often leads to long shutdowns, significant production losses, and high maintenance costs.

On the other hand, preventative maintenance, based on time intervals, offers better control and availability of spare parts, resulting in lower downtimes. However, it can lead to over-maintenance, excessive spending, and a lack of understanding of failure modes.

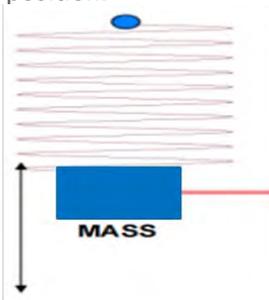
Predictive maintenance, conducted on condition, allows for extended time between shutdowns, reduced downtime, better comprehension of failure modes, and increased equipment availability at lower costs. Lastly, proactive maintenance emphasises doing things correctly from the beginning, such as proper installation, maintenance procedures, alignment, balancing, and lubrication, to ensure optimal performance.

Vibration Analysis is a dependable, accurate, and consistent method that provides precise identification of the vibration source and its severity. It effectively detects and diagnoses various issues such as unbalance, misalignment, looseness, bearing and gear defects, coupling and belt problems, electrical faults, flow-induced vibration, lubrication issues, resonance, and more. Notably, there are no limitations to its application in rotating equipment, making it a versatile tool for comprehensive analysis.

The Very Basics of Vibration Analysis

What is Vibration?

Vibration is a movement of a body about its reference position.



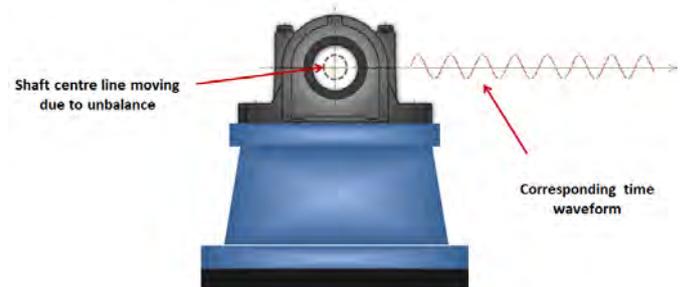
- Spring with mass attached to it will move up and down when initial force is applied.

Vibration is a response of a machine or a structure to a time varying force in the system.

- Loose bolt will cause vibration as it will become loose and tight during the rotation.
- Unbalanced impeller will pull the shaft out of the center as it rotates.

How do we represent vibration?

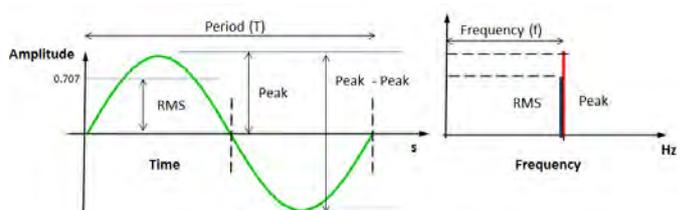
- Simple Time Waveform – Unbalance Example



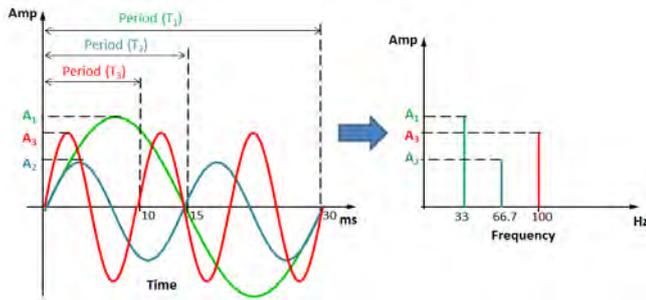
Simple waveform

Amplitude can be displayed as:

- Peak to Peak – used for measurement of Displacement
- RMS (Root Mean Square) – used for measurement of Velocity and Acceleration
- Peak – sometimes used for measurement of Velocity

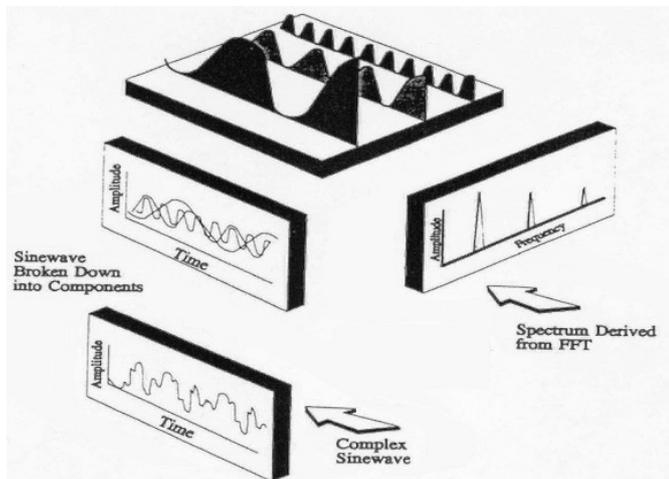


Frequency Spectrum vs Time Waveform



Fast Fourier Transform (FFT)

- FFT is a process of transforming waveform signal into a corresponding spectrum.



Parameters

Amplitude

- Indicates the severity of the fault.
- Amplitude is speed dependent for the same machine with the same fault.

Frequency

- Indicates the nature of the fault.
- Frequency of vibration is directly related to the characteristics of the component and the speed.

Phase

- Indicates the nature of the motion of the machine and the response of the structure.

Amplitude Units

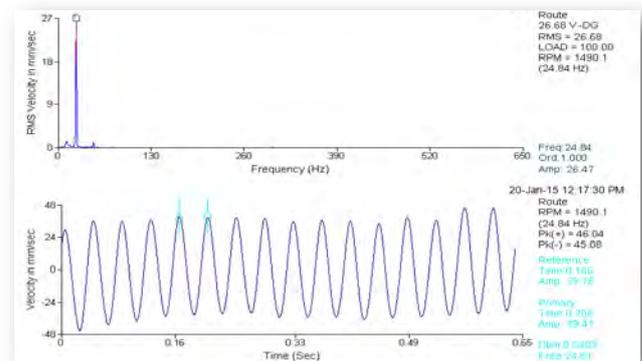
Displacement – μm (micrometre)

- The distance an object travels from its reference position
- Used to measure the level of unbalance.

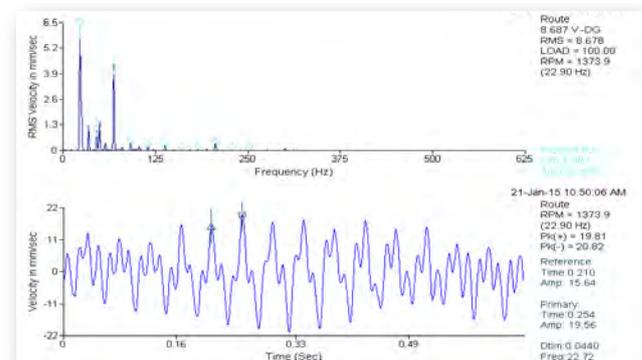
Velocity – mm/s (millimetres per second)

- The speed an object travels between those two positions
- The rate of change of displacement in time

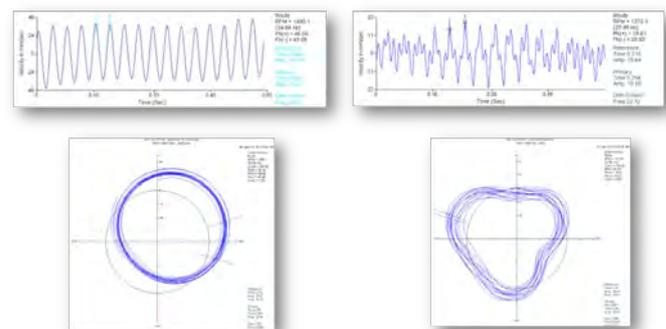
- General unit for majority of vibration measurements
- Acceleration – g ($=9.81\text{m/s}^2 = 9.81$ metres/second square)
- The acceleration with which an object travels between those two positions
- The rate of change of velocity in time
- Used for high frequency measurements and enveloping (like Demodulation)



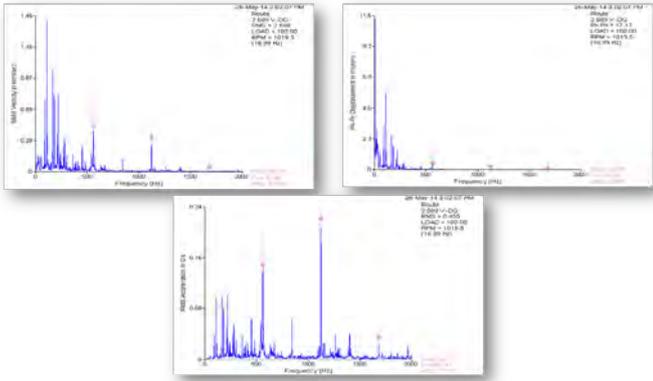
Simple waveform & Spectrum.



Simple waveform & Spectrum.



Circular waveform



Amplitude Units.

Types of testing

Acceptance Testing

What is Acceptance testing?

- It is performed to assess condition of newly installed, rebuilt or reconditioned equipment.
- The measured parameters are compared with relevant standards or acceptance criteria.
- Typically, part of a procurement or repair specification.
- May be performed by third party in-house to ensure acceptance standards are met.
- Measurements are carried out in accordance with a standardised test procedure.

Troubleshooting

When is troubleshooting performed?

- When there is no established program on-site and a critical machine is behaving badly
- When more analysis is required for a routinely monitored machine
- Additional tests are often performed.
- Additional techniques may be necessary.
- Historical data are closely analysed.
- It requires highly qualified Analyst.

Condition Monitoring

Setting up condition monitoring program

- Selecting machines for monitoring
- Creating a CM database
- Selecting measurement points
- Selecting measurement parameters
- Deciding on frequency of monitoring
- Routine Surveys
- History recording

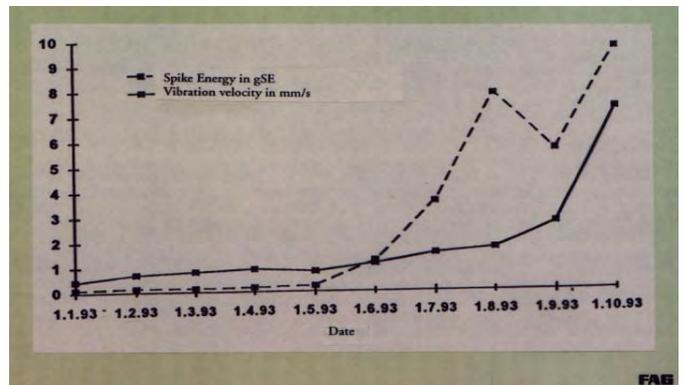
Creating a Database & Collecting all relevant data

- Machine type
- Speed
- Bearing types
- Gear types & number of teeth

- Impeller types & Number of blades, vanes
- Coupling type
- Motor power
- No of Rotor Bars
- General arrangement drawing

Condition Monitoring by Trending Vibration

- Overall vibration levels monitoring – Velocity.
 - Levels only in specified frequency range (usually 2–1000Hz)
 - Good indication of mechanical state of the machine to allow for general assessment of machine condition.
 - No indication of source of vibration
 - Good trending tool – change in levels means change in condition.
- High frequency monitoring – Acceleration
 - Levels only in specified frequency range (usually 2–15kHz)
 - Indication of impacting within the system – metal to metal contact
 - : Bearing Faults
 - : Gear Faults
 - : Turbulent flow
 - : Steam or air leaks

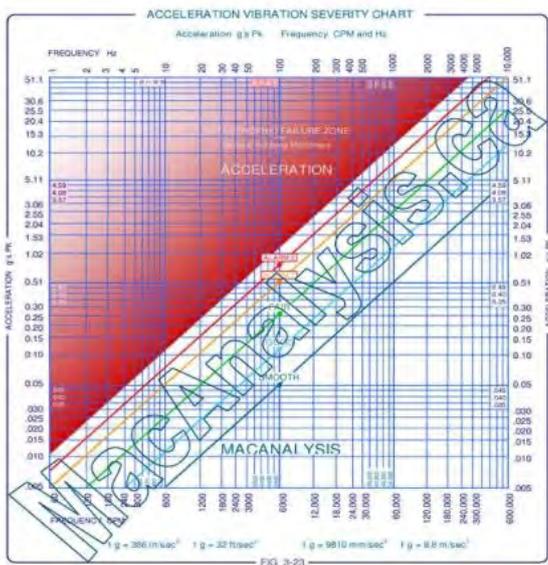


Using overall & High Frequency Trends for Monitoring.

VIBRATION SEVERITY PER ISO 10816					
Machine		Class I small machines	Class II medium machines	Class III large rigid foundation	Class IV large soft foundation
		in/s	mm/s		
Vibration Velocity Vrms	0.01	0.28			
	0.02	0.45			
	0.03	0.71		good	
	0.04	1.12			
	0.07	1.80			
	0.11	2.80		satisfactory	
	0.18	4.50			
	0.28	7.10		unsatisfactory	
	0.44	11.2			
	0.70	18.0			
0.71	28.0		unacceptable		
1.10	45.0				

GROUP 1: Small machines < 15kW
 GROUP 2: Medium machines 15kW – 75 kW
 GROUP 3: Large machines < 300kW
 GROUP 4: Turbo machinery > 300kW

Overall Vibration Limits – ISO 10816.



High Frequency Vibration Limits.

Other Limits

- Spike Energy
- PeakVue – Peak
- PeakVue – P-P Waveform
- Calculated for good lubrication conditions.
- High reading may be caused by friction or interference.

Data Acquisition

Measuring Vibration

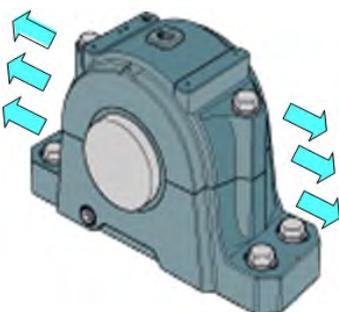
Relative Vibration

- Between a shaft and a journal bearing, or absolute motion.



Absolute Vibration

- Casing reading on a plummer block bearing, gearbox or motor etc



Accelerometer

- Most used sensor.
- Broad frequency range: 2 Hz – 12 kHz.
- Small, Rugged, Light weight.
- Easy to mount.
- No external signal conditioning required.
- Constant current power supply.
- Integrated Circuit Piezoelectric (ICP).
- Integrated Electronics Piezo Electric (IEPE).



Analysis of Vibration

Basic Machinery Faults

What faults are possible in complex machines?

- Faulty foundations
- Loose mounting
- Misalignment
- Unbalance
- Bearing Faults
- Gear Faults
- Electrical problems
- Blades / Vanes problems
- Belts / Chains problems
- Resonance
- Flow problems
- Oil whirl, Rub

Basic Faults

How do they show up in a Spectrum?

Basic Analysis Process

What do we need to know before analysis?

- Speed
- To positively identify the Turning Speed Frequency

Machine Data

- Type of machine and how is it mounted.
- Type of coupling
- Bearing designations
- Number of vanes / blades on pumps / fans/ agitators
- Belt pulley diameters and distance
- Number of shafts in the gearbox and number of teeth on each shaft

- Number of rotor bars and stator slots in electrical motors

Load

- To ensure that we compare same data.
- Majority of faults will have higher amplitude with higher load.
- Except some electrical faults
- Transferred vibration – control circuits, oil discharge systems etc.

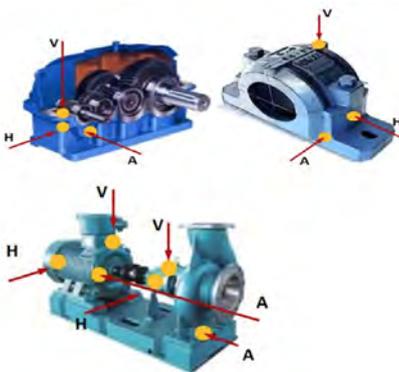
What do we want to achieve?

- Identify any changes (trending vibration levels)
 - Changes in overall vibration levels (velocity) and high frequency levels (acceleration)
 - Changes in vibration pattern
- Identify possible sources of vibration.
 - Frequency of vibration (synchronous or non-synchronous)
 - Direction of vibration
- Assess the severity of the potential fault.
 - Amplitude of the relevant peaks in “raw” spectrum
 - Amplitude of the relevant peaks in the enveloped spectrum
- Identify potential need for additional tests or checks to confirm the diagnosis.

Basic Analysis Process

Direction of Vibration

- Viewed in relation to the axis of rotation.
 - Radial vibration – Horizontal (H), Vertical (V)
 - Axial Vibration (A)



Basic Faults – Unbalance

What is unbalance?

- Static Unbalance
- Centre of mass ≠ Centre of rotation

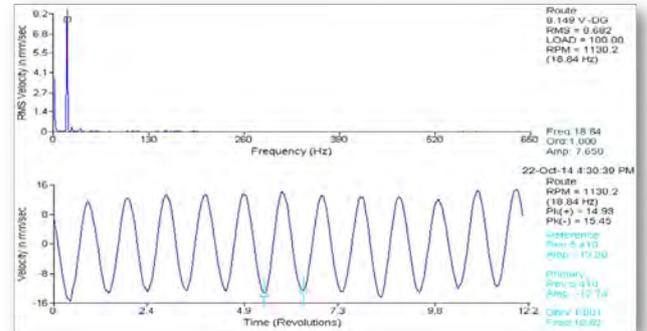
Dynamic Unbalance

- Rotation axis is not coincident with a principal axis of inertia of the rotating body

What causes unbalance?

- Poorly manufactured parts (impellers, rotors)
- Poorly assembled components

- Wear of impellers, vanes or broken or missing rotor parts
- Build-up of material on impellers / vanes
- Poor balancing procedures / wrong specs



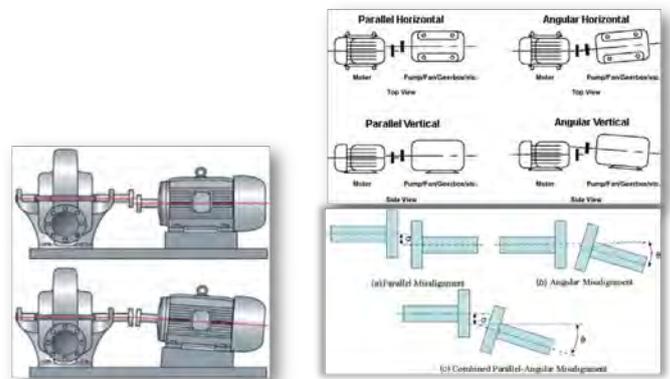
Basic Faults – Misalignment

What is misalignment?

- Centrelines of two coupled shafts are not co-linear

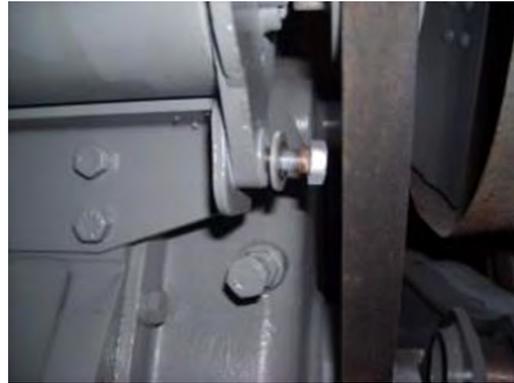
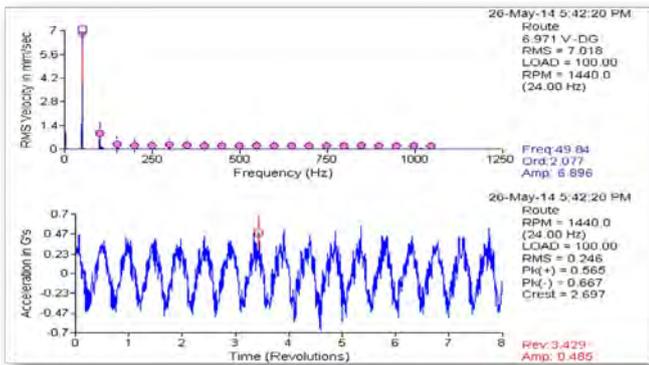
Misalignment Types

- Parallel
- Angular
- Combined

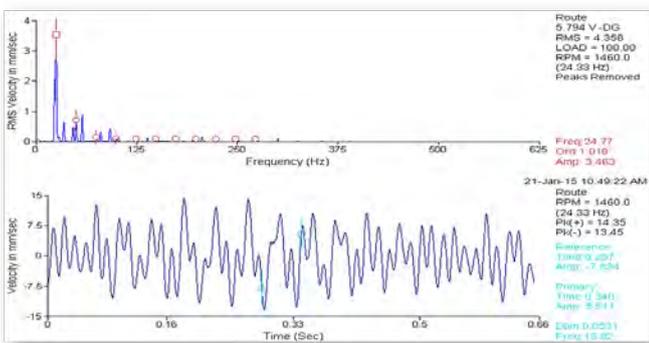


Misalignment – What to look for in the spectrum?

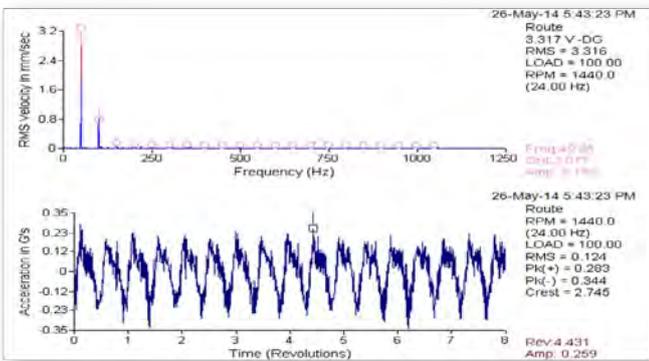
- Parallel
 - High radial vibration – 2xTS may be dominant but 1x, 2x and 3x are typical.
- Angular
 - High axial vibration at 1x, 2x and 3x TS
- Combined
 - Combination of above
 - Higher orders of shaft TS are generally low.
- Waveform
 - Regular pattern with no or very little impacting (M @ W)
- Phase
 - Shift of 180deg across the coupling (measured in the same plane)



Misalignment Spectrum – Horizontal (Offset Misalignment)



Misalignment Spectrum – Horizontal (Mixed Misalignment)



Misalignment Spectrum – Axial (Angular Misalignment)

Basic Faults – Looseness

Looseness – Mechanical

- Loose bolts
- Cracked foundations.
- Anything that is part of the support / mounting structure.

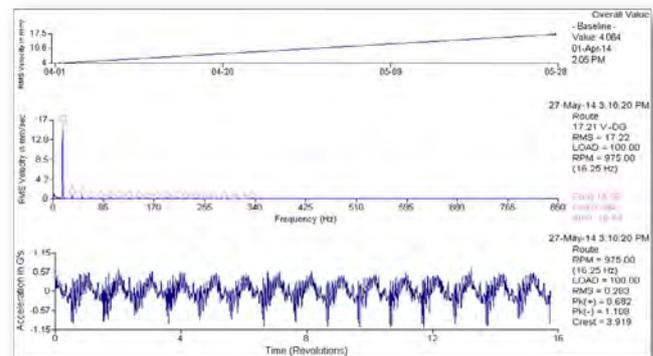
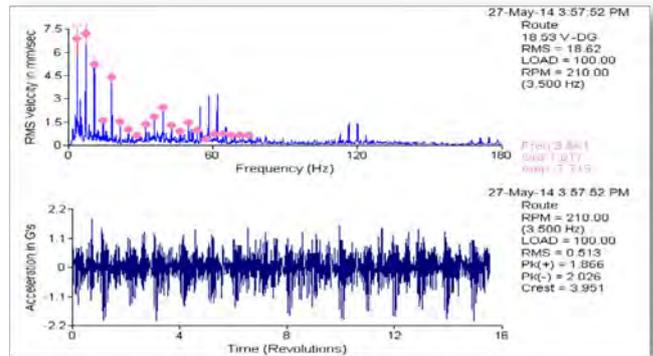
What's typical?

- Impacting
- 2 x TS Vibration is most common.
- 1/2 x TS Vibration can be present

Structural Weakness

What's typical?

- Swaying, not impacting – spectrum basically same as for unbalance.



Looseness Spectrum – Mechanical

Looseness – Rotational

- Bearings loose on shafts / sleeves
- Sleeves loose on shafts
- Pulleys, gears etc
- Anything that rotates together with the shaft (not the part of the support structure that we were talking about in mechanical looseness section)

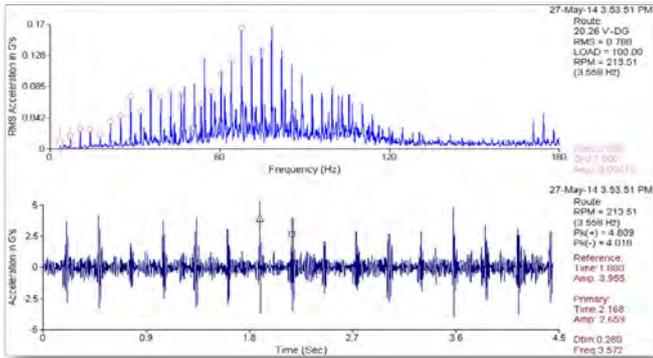
What's typical?

- High impacting at 1 x TS with several harmonics
- Often increased “base” floor vibration
- Very distinctive time waveform

Basic Faults – Resonance

What is resonance?

- A common but often not well understood problem.

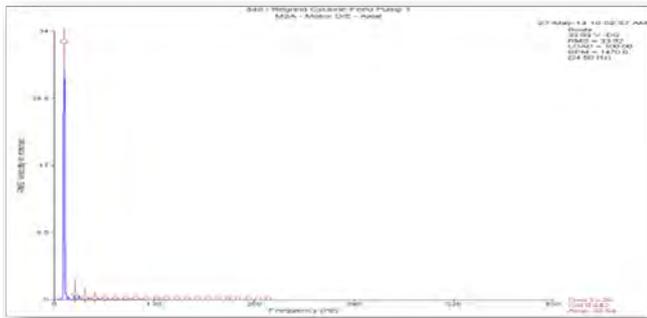


Looseness Spectrum – Rotational

- All machine components have a natural frequency.
- At the resonant frequency the restoring forces due to stiffness of the machine are counter-balanced by the inertial forces due to the mass of the machine.
- Effectively the machine behaves as if it has no mass. i.e., it does not take much energy to move it.
- Should avoid operating speeds that are near a natural frequency.
- To identify – bump test.

Resonance detection and spectrum

- Vibration levels are extremely high.
- Machine’s “normal” vibration at the Turning Speed is excited by a natural (resonance) frequency in the system that is close to the TS.



Enveloping for early fault detection

Enveloping (Demodulation, Peakvue)

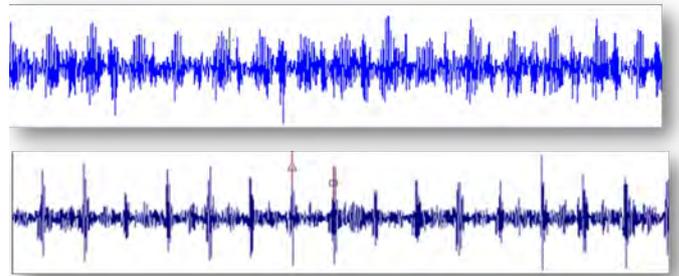
- Enveloping is a special technique used to extract frequencies that are modulating the amplitude in the time waveform.
- Modulating? – what does that mean?
- It means causing changes in amplitude (or frequency) of vibration.

Enveloping (Demodulation, Peakvue)

Difference between “raw” and enveloped data

- Enveloped data is specially filtered to eliminate vibration at lower frequencies and focus on high frequency signals that are created by a metal-to-metal contact

It is important to understand both.



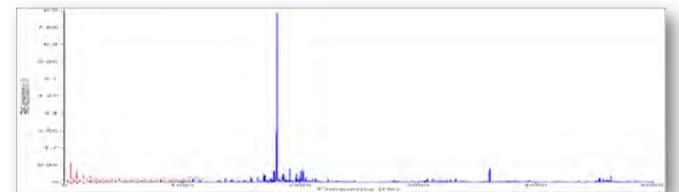
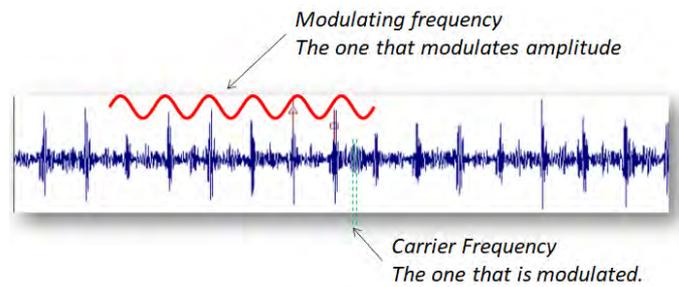
- Shaft vibration vs noise created on metal-to-metal impact or change in friction/pressure conditions.
- Physical damage to the component (bearing races) vs uneven running of rolling elements.

Why do we use enveloping?

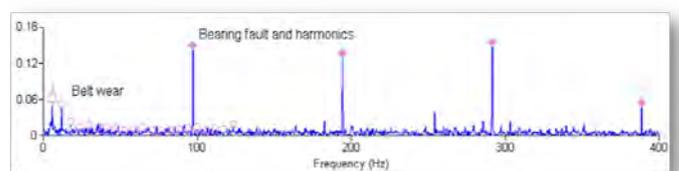
- Ease of analysis
- Very early fault detection

Enveloping (Demodulation, Peakvue)

How does it work?



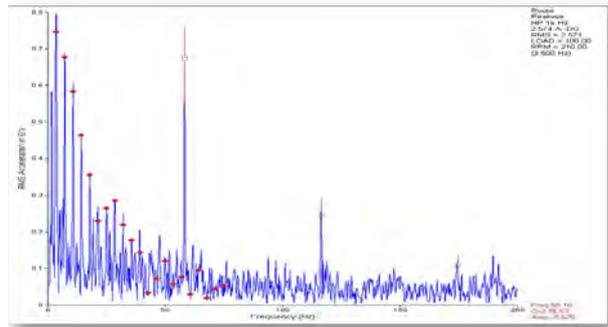
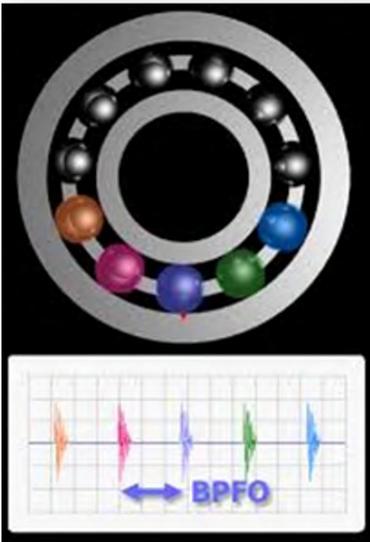
- Apply a Low Pass filter (400Hz) to extract the modulating frequencies
- Present modulating frequencies in a separate spectrum



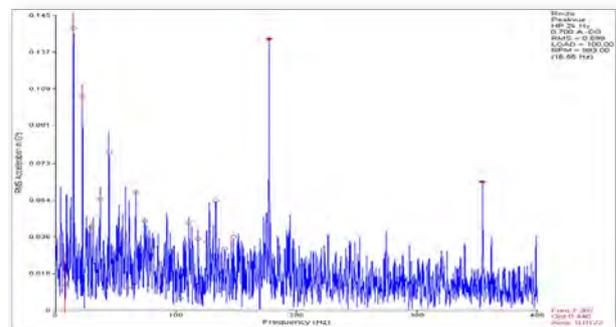
Basic Faults - Bearing Defects

Fortunately bearing faults are EASY.

- Vibration is non-synchronous.
- Fault frequencies are very specific.
- Harmonics are present.
- Sidebands are quite common.
- They can be calculated.



Bearing fault spectra



Bearing fault spectra



DELLON DX BORESCOPE

The DX Borescope System provides excellent durability and unmatched user interface for all your RVI needs. With lengths in long steer 8Mtr 10Mtr 15Mtrs with one diameter of 8.2mm

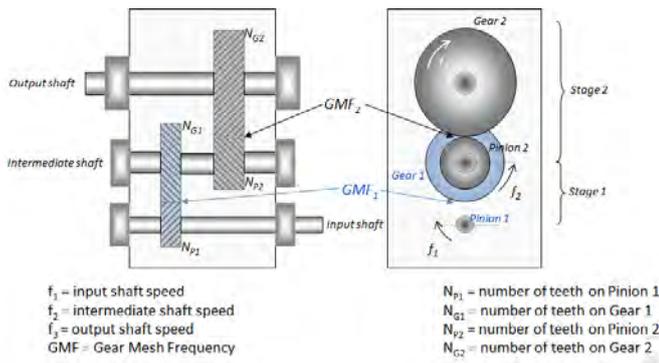


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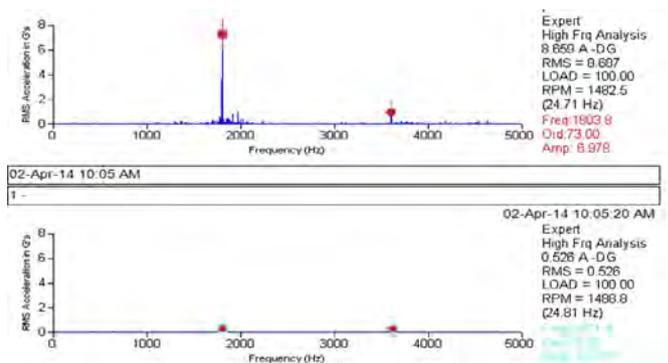
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Gear fault frequencies

Detecting gear faults

- Vibration at GMF and harmonics
- Sidebands of the shaft on which the gear is mounted
- Sidebands of other shafts
- Modulation
 - Shaft speeds
 - Meshing worn teeth
- Impacting
 - Faulty teeth
 - Loose components



Gear fault frequencies

Basic Faults - Summary

What do we look for in the spectra?

(After detecting the change in amplitude or a very high amplitude)

- Fundamental frequencies of various vibrations
 - To tell us where the vibration is coming from.
- Harmonics
 - To establish if the vibration is smooth or not (distorted)
 - Misalignment, Looseness, Wear in bearings or gears
- Sidebands
 - To identify the fact that the amplitude raises and falls.
 - Typical for bearing and gear faults.
 - Sidebands of shaft speed frequency around the GMF in gears
 - Sidebands of shaft speed frequency around BPF1
 - Sidebands of cage frequency around BPFO



EMPLOYMENT POSITION

WA Sales Specialist - Industrial (NDT, ANI, RVI)

About the Role

We are seeking to appoint a passionate Sales Specialist - Industrial. Reporting to the National Sales Manager - Industrial, your key focus will be to manage; the Evident Non-Destructive Testing (NDT) portfolio (Ultrasonic and Eddy Current NDT), Remote Visual Inspection (RVI) and Analytical Instruments (ANI) within various industry sectors including Power Generation, Oil & Gas, Mining, Defence, Aviation, and Inspection Services.

You will be a self-starter, market savvy, identifying and building relationships with new customers whilst maximising the sales derived from the existing customer base within the West Australian territory.

Why work with us?

We are dedicated to fostering a high performing culture, a collaborative environment, and enabling everyone to shine. Our common values of Integrity, Empathy, Long-Term View, Agility and Unity form the foundation of our culture and guide our behaviour, where our people feel like they are making a difference every single day.

What we are looking for

- Demonstrated field sales/ account management experience highly desirable
- Experience or studies within a relevant Engineering discipline (would be a distinct advantage), Industrial, Materials, Mechanical or Electrical or trade equivalent.
- Experience and understanding of NDT (Non-Destructive Testing) techniques, specifically Ultrasonic NDT techniques and applications will be viewed favourably;
- Ability to liaise and build relationships with customers and company stakeholders;
- Excellent verbal and written communication skills, especially the ability to present logical and cohesive arguments;
- Enjoy working towards KPIs and targets at a swift pace;
- Ability to negotiate at all levels with a genuine desire to always deliver service-excellence.

Salary Competitive package including significant commission component. Immediate start.

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experienced professionals are committed to providing high-quality, reliable inspection services to ensure the safety and compliance of our client's assets. We use state-of-the-art equipment and adhere to industry standards and regulations to deliver accurate, actionable results.

ARI has recently added to our Advanced NDT capability with 2 new services:

1. PA-CAT™ inspection technique for Contact Point Corrosion (CPC) and Corrosion Under Pipe Supports (CUPS). ARI is the first company to introduce this

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2. Long Range Guided Wave Screening for corrosion in pipes.

Our goal is to help clients reduce downtime and improve the reliability of their assets while maintaining the highest safety standards. ARI has a proven track record of supporting planned shutdown services, new construction projects, and delivering routine in-service inspections of the highest quality. When your operations cannot stop our team will execute 24 hours a day, 7 days a week to meet your inspection needs.

With offices in Bunbury, Perth, and Adelaide, we are on hand to partner with asset owners and operators to ensure Safety and Efficiency.

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- Enhance your environmental and safety performance

Your Plus:

- Our Ardrox® NDT products hold all major approvals for the aerospace market and are widely used in the industry for the fast and safe detection of indications

- Easy and highly reliable processes
- Network of experts who are abreast of the latest developments through close contact with NDT authorities across the globe
- Our Technical Centre, located in Frankfurt, is continually focused on the development of new and innovative products
- Complementary processes such as surface pre-treatment products and temporary corrosion protection
- Ardrox NDT now with a 5 year shelf life.

Complementing the Ardrox® range, Chemetall also supplies a range of Ultrasonic Couplants and associated equipment including the Labino range of LED Inspection Lamps.

Chemetall's manufacturing facility in Melbourne is certified to ISO 9001 and ISO 14001 and is supported by distribution networks throughout Australia including J.G Thomas in Perth.

Effective customer support and product backup is assured with national coverage by our dedicated team of sales and technical experts.

P: 1800 008 738 E: customer.service.au@basf.com

W: www.chemetall.com.au



Industrial Mining Inspection Solutions

(IMIS) is a Queensland based service provider of Non-

Destructive Testing solutions to the mining and resources industry. With over 30 Combined years of Inspection Experience, our highly qualified and experienced inspection personnel give our clients the edge when it comes to inspecting equipment from a statutory or monitoring perspective.

We tailor our NDT and Inspection Solutions to suit client needs from simple MPI, PT, UT thickness inspections through to advanced inspections such as UT, Phased Array and Eddy Current on ground, scaffold or via rope access.

IMIS offers pressure vessel (AICIP accredited) and tank inspections (API653); structures integrity inspection and

repairs; conveyer gantry inspection and repairs; piping surveys and repairs; chute lining installation and repairs; inspection of shafts, castings, forgings, weldments, piping chutes and equipment inspections of trucks, diggers and draglines, all of which can be performed on ropes.

IMIS is accredited to ISO:17025 as a testing laboratory and to ISO:17025 for Infrastructure and Asset Integrity. We are also accredited for ISO:9001 for Quality Management System and ISO:45001 for Occupational Health and Safety Management System.

We work with our clients through each of the 5 steps to ensure our projects are completed in full and on time From Establishing the objective, through to Creating, Implementing & then Monitoring the Strategy, through to Finalising Works, to ensure our clients are satisfied and the best strategy is put in place.

www.imisgroup.com/rope-access



OMS

OMS is an advanced cloud LIMS+ERP program designed to cover Enterprise' Operations Management

Systems to comply with ISO 17025, ISO 17020, ISO 9001. Since 2010, OMS is validated >2 Million hours, currently by 300+ users, at 9 companies (24 NATA sites in 12 cities), overseeing combined turnover >\$45M. OMS is available at monthly subscription, supported by 30+ developers.

OMS covers requirements for NDT, Metallurgy, Chemical testing, Mech Test, Hydro, Inspection & QMS documents. OMS algorithm calculates, validates, evaluates compliance, & record essential points as per Standards. OMS reports instantly, securely Sign (trademark), eliminates manual PDF, & emails at a click maintaining revision control. OMS includes Account (payroll, Invoice, Receivables, DSO, Credit analysis, Debt collection, Suppliers, PO, Bills, productivity, job lifecycle analytics, etc, OMS manages, & several automated business processes. Some of the highlights are-

- **Dashboard** – Live progress (Commence, complete, review, sign, email, Invoice)
- **Personnel** – Manage access, tester approvals, directory, mobile timesheet,
- **Assets** Info, manuals, photos, location, cost, automated events – calibration, inventory, Rego renewals
- **Specifications** – Materials database, Test Standards, procedures, Master-reference data library, configure result table.
- **DMS** – Eliminate CFS server, shared documents on OMS for staff or for public (website).
- **CRM** – Automated customer survey, analytics, & several automation. Customisable Lead management & Quotes (your T&C).
- **MIS** – Several automated business reports.
- **Emails** – Configure emails to eliminate Outlook. Add your own FAQ's



Russell Fraser Sales

Dolphitech in Australia

RFS is now representing Dolphitech of Finland to bring the best technology Ultrasonics to the inspection of composite materials. The new

Dolphicam2 uses a large format ultrasonic probe and various frequencies to bring measurement of aerospace and industrial composites to a new level accuracy with clear easy interpretation.

The Dolphicam2 system is ready for inspection in around three minutes from opening the case.

Dolphitech technology is used on Carbon Fibre inspection, Turbine Blades, Yacht Hulls, Honeycomb structures, Military Ground Vehicles, Polypropylene

Piping, Automotive Spot Welding, Aviation Inspections and more.

Save time by performing analysis at the point of inspection: no need to transfer to a separate workstation and use separate software.

As the dolphicam2 uses only straight beam ultrasound, the equipment set-up and data interpretation are easier than competitors.

The system has A-Scan, B-Scan, C-Scan and 3D view.

Annual calibrations can be done on-line without the Dolphicam2 having to leave your premises.

RFS is happy to provide more information and a demonstration of the Dolphicam2 System.

Call: Russell Fraser Sales Pty Ltd. T – 02 9545 4433, E: rfs@rfsales.com.au, W: www.rfsales.com.au



Vertech Group

At Vertech Group, with operations in Australia, New Zealand, and the USA,

we offer a comprehensive suite of inspection, Non-Destructive Testing (NDT), and maintenance solutions, all backed by state-of-the-art specialist access systems. Our NDT capabilities stand out in the industry, ensuring the integrity and reliability of assets while minimising downtime and maximising safety.

Our group comprises a network of complementary and specialist service providers collaborating to drive innovation in project delivery across diverse market sectors. Among these providers are Geo Oceans, a Mini-ROV and subsea inspection services leader, and Sonomatic, a globally recognised expert in specialised NDT. These partners bring unparalleled expertise in NDT techniques such as ultrasonic testing, radiography, magnetic particle inspection, and more, allowing us

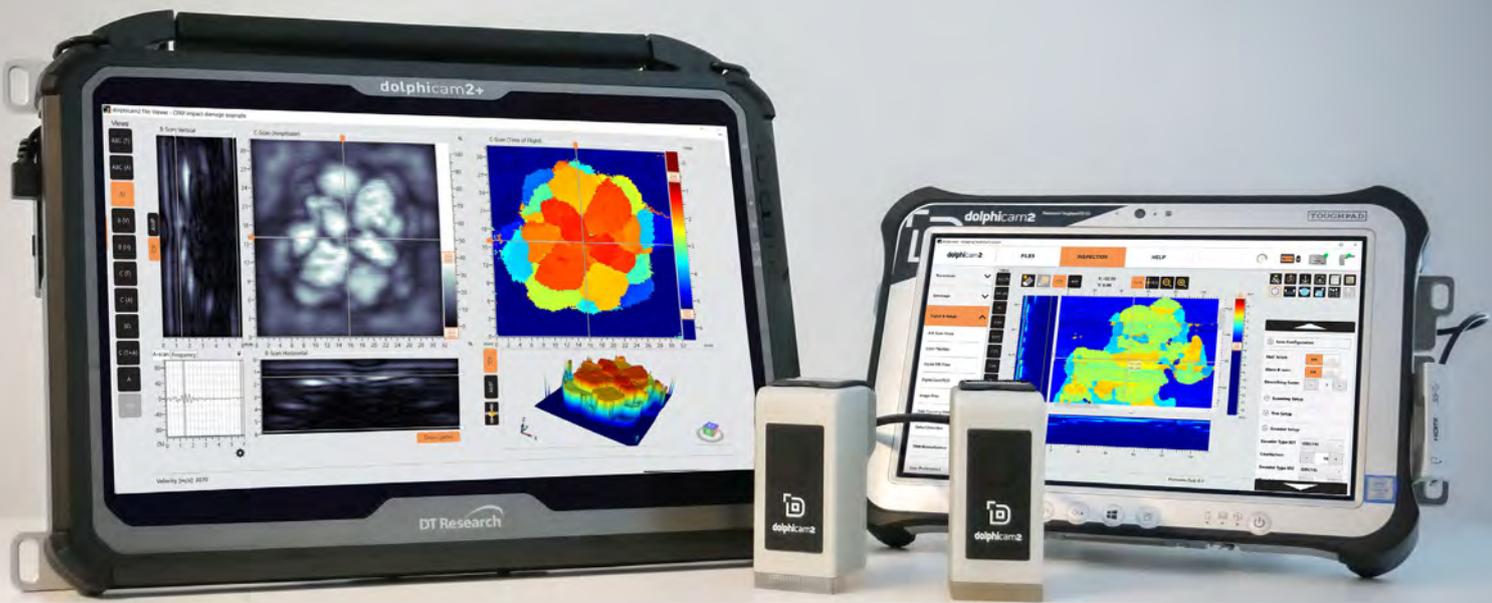
to detect and evaluate potential flaws in materials and structures accurately.

Additionally, we benefit from the expertise of AUAV, a specialist in UAV, drone, and data analytics, which enables us to conduct remote inspections and gather essential information with minimal risk to personnel. APS Industrial Services, which offers construction, access, and engineering services, and Abseil Access, a New Zealand-based infrastructure, engineering, and geotechnical specialist, contribute to our ability to provide end-to-end asset management solutions.

Our innovative access systems enhance our non-destructive testing capabilities, allowing for safe and efficient inspections in even the most challenging environments. These systems include rope access, confined space entry, and custom-engineered platforms, ensuring seamless integration with various inspection techniques.

For more information, visit vertechgroup.com.au

RFS COLLABORATES WITH DOLPHITECH TO INTRODUCE CUTTING-EDGE ULTRASONICS TECHNOLOGY



RFS has partnered with dolphitech to bring the best ultrasonics technology to the inspection of composite materials.

The new dolphicam2 uses a large format ultrasonic probe and various frequencies bringing the measurement of aerospace and industrial composites to a new level of interpretation and accuracy.

-  **Fast** - Ready to use in 60 seconds
-  **Accurate** - Full data capture from 16,384 elements
-  **Easy to use** - Ready to inspect in 7 simple steps
-  **Portable** - Lightweight, small and rugged
-  **Supported** - Expert technical support and training

Contact RFS:
T: 02 9545 4433, E: rfs@rfsales.com.au, W: www.rfsales.com.au



Power You Can Carry

OmniScan™ X3 64 Phased Array and TFM Flaw Detector

Improved Agility and Mobility

Compact and easy to transport, the OmniScan™ X3 64 flaw detector offers true portability, providing increased convenience and flexibility for jobs where space is limited.

Accomplish More in Less Time

Capable of storing large amounts of inspection data, the 1 TB internal SSD enables you to perform bigger scanning jobs and stay on site longer without needing to transfer your files.

Perform Faster TFM

The optimized acquisition speed and efficiency of TFM using a full 64-element aperture and the system's sparse firing algorithm make it easier to incorporate as a regular part of your inspection process.



Scan here
for more
information