NDT Trends.
October 2026 | Issue 115

# How Much More Can We See?

## Exploring the New Technologies Expanding NDT

In Association With

Waygate Technologies
a Baker Hughes business

PG: 20
**Cover Story**
From AI Promises to Proven Performance: How Denoising in Computed Tomography...

PG: 26
**AI Evaluation**
iMeva AI: Beyond image acquisition

# A Heartful Thanks to all the Contributors

This edition of NDT Trends has been enriched by the knowledge, experience, and perspectives shared by our contributors. Through your articles, interviews, and insights, you help OnestopNDT bring meaningful conversations to the global NDT community. Your support adds depth to every edition and strengthens our mission of promoting learning, innovation, and industry growth. We sincerely value your contribution and thank you for being part of this journey.

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ONE STOP NDT
October 2026 | Issue 115

# About OnestopNDT

OnestopNDT is a global digital platform built exclusively for the Non-Destructive Testing industry. We connect professionals, companies, manufacturers, training institutes, and decision-makers through industry-focused content, visibility, knowledge sharing, and professional engagement.



# SOME THINGS IN NDT CAN'T BE ~~Googled~~.

That's why we created **NDT Talks** —a monthly panel where real experts share insights you won't find online.








## A New Way

There was a time when getting a clearer image was the goal. Today, the more interesting question is what we can actually learn from that image.

A CT scan can reveal details that were easy to miss before. Neutron imaging can show us something X-rays may not. Thermal cameras can keep watching long after a traditional inspection is over. Computer vision is also taking inspection out of fixed workstations and into the field.

But more information does not automatically mean better inspection.

Someone still has to question the result, understand what the technology is telling us, and decide what matters. That human judgement remains just as important as the technology itself.

And that is what makes this moment interesting for NDT. We are not simply finding better ways to see defects. We are finding new ways to see, interpret, connect, and act on information.

So perhaps the real question behind this edition is not just how much more can we see?

*It is **what will we do with what we see?***

Santosh Gavankar
Editor-in-Chief



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Expert Article

# From Reactor to Lab

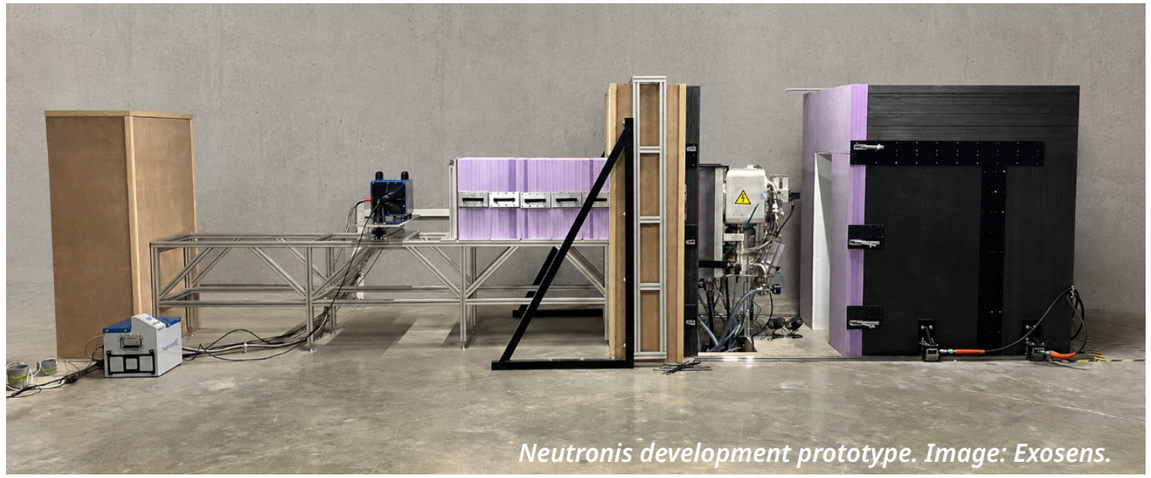
## Bringing Neutron Imaging into the NDT Toolbox



**Serge Duarte Pinto**
*Director of Innovation, Exosens*

*Scan to Know More*





*Neutronis development prototype. Image: Exosens.*

**Neutron radiography can reveal materials and features that are hard to see with X-rays. The principle has been known for decades. The challenge has been to bring a useful neutron beam to where industrial inspection takes place. New source, detector and digital imaging technologies are starting to change that.**

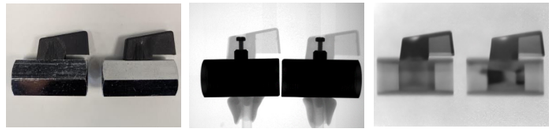


*Figure 1. The same two valve parts in a photograph, an X-ray radiograph and a neutron radiograph. The lubricated part is on the right. X-rays map the metal hardware; neutrons reveal the hydrogen-rich grease. Images: Exosens*

The quickest way to explain neutron radiography to someone who knows X-ray inspection is to show both images of the same part.

Figure 1 shows two small metal valves, first as a photograph and then in X-ray and neutron radiographs. The valve on the right contains grease; the other does not. In the X-ray image, the metal bodies dominate, and the grease adds little contrast. In the neutron image, the balance shifts. The metal is easier to see through, while the hydrogen-rich grease stands out.

The inspection geometry is familiar. A source illuminates the part, a detector sits behind it, and the transmitted radiation forms a projection image. What changes is the interaction with matter. The two radiographs answer different questions about the same part.

That is the case for neutron radiography in NDT. It does not replace X-ray imaging. It adds another contrast mechanism, and with it another view.

## Why the contrast shifts

X-rays interact mainly with the electrons around an atom, so their attenuation tends to rise with atomic number and density. This makes them very good at showing dense metal structures, while many light organic materials are fairly transparent.

Neutrons interact with atomic nuclei instead. Their attenuation follows a much less tidy pattern. Hydrogen interacts strongly with thermal neutrons. Lead and bismuth, both strong X-ray absorbers, are quite transparent to them. Even isotopes of the same element can behave very differently in a neutron beam, while ordinary X-ray radiography offers almost no isotope contrast.

The effect is shown in the scatterplot in Figure 2. If the two modalities attenuated materials in much the same way, the points would gather near the diagonal. They do not. Many sit high on one axis and low on the other.

Neutrons are not just giving us more or less contrast than  X-rays. They are giving us different contrast.

*"Neutrons are not just giving us more or less contrast than X-rays. They are giving us different  contrast."*

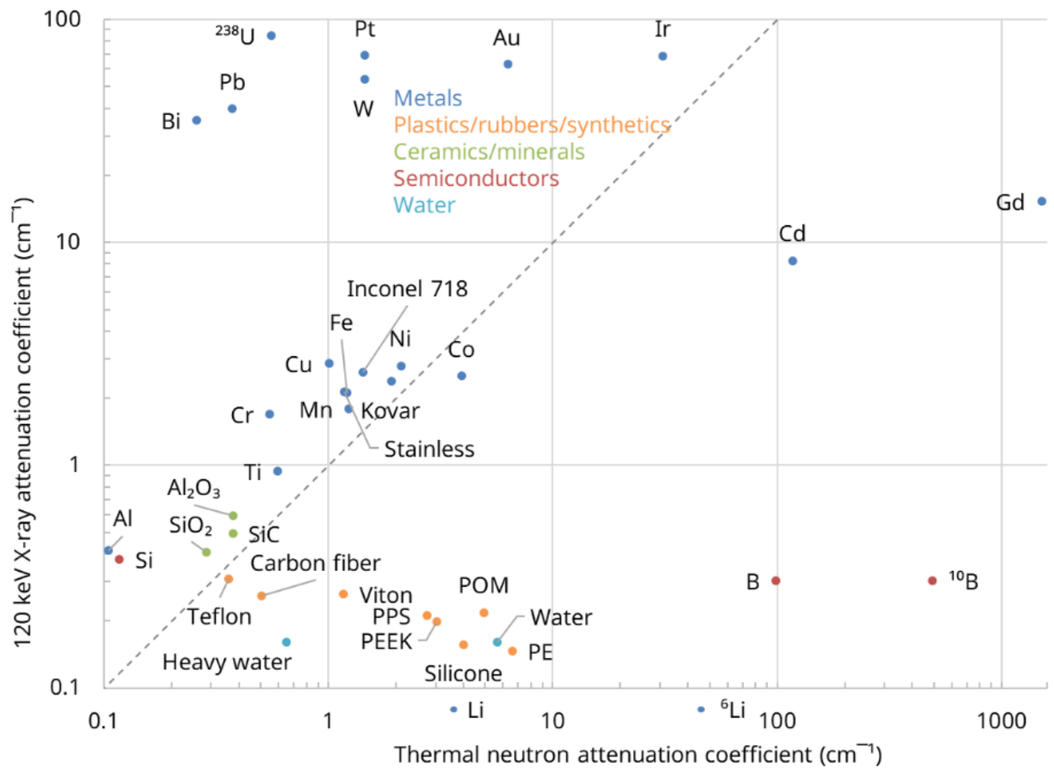



*Figure 2. Contrast for thermal neutrons versus contrast for 120 keV X-rays. Materials far from the diagonal differ most strongly in their relative attenuation. Gadolinium is an extreme thermal-neutron absorber. Graphic: Exosens.*

Gadolinium is the most striking case. It absorbs thermal neutrons so strongly that even a small amount can act as a tag. A gadolinium-bearing penetrant can enter porous material or a fine, surface-connected crack that runs deep into a part. Where the penetrant is retained, the tag leaves a strong mark in the neutron image, even through dense surrounding metal.

The textbook example is ceramic core residue in a high-pressure turbine blade. The porous residue holds the tag and becomes easy to spot. Figure 2 gives the scale of the effect. No element offers X-rays anything close to that contrast on the plotted scale: gadolinium's thermal neutron attenuation is more than an order of magnitude above the highest X-ray attenuation.

This leads to a useful rule. If an inspection can be done well with X-rays, use X-rays. The method is mature, fast and widely available. Neutron imaging becomes useful when the information sought is a poor match for X-ray contrast. It belongs beside X-ray radiography in the toolbox, not in its place.

## The bottleneck is access to sources

Neutron imaging is not new. Modern research facilities can produce neutron radiographs and tomographic data of superb quality. What has kept the method out of day-to-day industrial NDT is the source.

Bright thermal-neutron beams have mainly come from research reactors or large accelerator sites. There are few of them. Beam time must be booked. Parts must be packed and shipped. Lead time, cost, customs, and confidentiality can all become part of what should have been an inspection task.





Established neutron-radiography service providers still record the final image on film. A customer sends in a part; after exposure, the part comes back with physical films. Film can yield excellent images and remains qualified in long-standing processes. Even so, the workflow would be familiar to an X-ray inspector from the middle of the last century.

X-ray inspection has followed a different path. A manufacturer can place a system near production or development and use it when needed. A neutron radiograph has more often meant a special campaign at a remote site.

For Exosens, that led to a different design question. We did not set out to build a small research reactor. We asked how small a neutron source could be made useful for imaging.

## Bringing the source into the lab

Neutronis grew from that question. It pairs a compact deuterium-deuterium fusion source with efficient neutron detection and a native-digital imaging chain.
Deuterons are accelerated into a deuterium-bearing target, producing fast neutrons at about 2.5 MeV. A moderator slows them down to thermal energies. Beam-forming and shielding hardware then turn part of the output into the thermal neutron beam used for radiography.

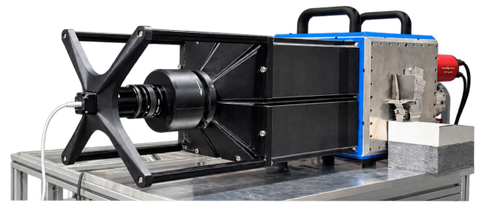
The source can fit into an industrial system. The trade-off is flux: a reactor beamline can deliver orders of magnitude more thermal-neutron flux at the sample. At a bright beamline, even a modest detector can gather enough neutrons for a fine image. With a compact source, every neutron counts. Detection efficiency, beam geometry, shielding and background rejection all carry more weight.

*"With a compact source, every neutron counts."*

Exosens already had one key part: Neutronic[i], a detector first developed for neutron research facilities. Its high efficiency is a strong match for the lower flux of a compact source. Its camera readout also supports a native-digital chain.

The development prototype pictured at the start of this article brought the source, moderator, beam optics, shielding, detector, and acquisition system together. In an early test, water flowing through channels in an aluminium cooling block became the main feature. The aluminium was fairly transparent. An X-ray image gives almost the reverse balance. The complete chain worked; the next task was to make it useful and repeatable.

## Neutronic[i] making scarce neutrons useful



Most neutron imaging detectors let the great majority of incoming neutrons go unused. Neutronic[i] does not. Its patented neutron-sensitive microchannel plate detects more than half of the thermal neutrons that reach it. That level of efficiency sets it apart from every other neutron imaging detector on the market.

At a research reactor, an intense beam can mask detector inefficiency. A compact source has no such luxury. Each neutron captured shortens the path to a clear image; each one missed adds exposure time. Neutronic[i] is therefore much more than the camera at the end of Neutronis. It is the technology that turns the modest flux of a compact source into practical, native-digital neutron radiography on site.

## When every neutron becomes data

Film is not only a physical medium; it sets the whole service workflow. Neutronis starts native digital. The detector records individual neutron events, and Neutronic[i]s efficiency allows a high-quality radiograph to be made with much less total neutron fluence than film needs.

That changes what happens after exposure. The image can be corrected, reviewed and shared as data, without developing or shipping physical sheets. Open-beam and background measurements correct for non-uniform illumination and unwanted signal. Filtering, reconstruction and denoising can then work directly on the neutron data. We have also added AI-assisted processing to this set of tools.

Its task is not to invent details that were never measured. Physics still sets how many neutrons reach the detector, and software cannot fix poor statistics. It can, however, make sound use of every event that was recorded. At ASNT in 2025 we showed event-counting acquisition, flat-field correction, advanced post-processing and real-time reconstruction. By ECNDT in 2026, compact-source imaging and AI-assisted denoising were parts of one joined-up chain. A Neutronis image is made by the source, moderator, beam optics, detector, acquisition, calibration and reconstruction working together.

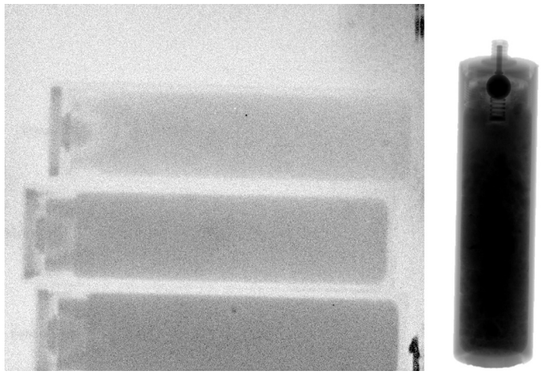


*Figure 3. Empty, half-full and full metal-hydride cartridges in neutron transmission, with the X-ray view at right. Images: Exosens.*

## Finding the right inspection problems

A new imaging tool creates a strong urge to point it at everything. We have tried to resist that. The useful question is not, “Can we make a neutron image of this?” It is, “Does this part contain information that another NDT method struggles to show?”

Hydrogen gives some of the clearest examples. We have imaged metal-hydride storage cartridges and could tell whether they were empty, half-full or full through the outer casing. More recently, we imaged a hydrogen fuel cell in operation. Neutrons are a natural fit because they respond strongly to hydrogen and water, both of which can be hard to track with conventional radiography.

The same logic reaches into routine mechanical parts. Lubricant inside a heavy assembly may be all but invisible to X-rays yet show strong neutron contrast. Sealants, O-rings, adhesives and polymers can behave in much the same way. Energetic materials are another established field: propellants and explosives contain light elements but often sit inside metal housings. Lithium also makes neutron imaging useful in battery research.

There is no single “neutron application”. These cases share a gap between the information sought and the contrast offered by established methods. That is where another tool earns its place.

## From an imaging experiment to an NDT system

There is a wide gap between making a convincing radiograph and delivering industrial NDT equipment. A working system must be safe and predictable outside a neutron facility. Its geometry must be stable and repeatable. Field of view and scan time must fit real parts. Components must be maintained and serviced. Installation and regulatory compliance cannot rely forever on the physicists who built the prototype.

Those tasks now make up much of the Neutronis programme. The generator is being upgraded for more output, the useful imaging area is growing, and the reconstruction chain is improving. In parallel, we are working through the regulatory and system-engineering steps needed for the first customer sites.

There will be trade-offs. A compact source cannot match a major reactor, and some work will still need a research beamline. But a reactor beamline in a smaller box was never the goal. The goal is enough image performance in a system that can sit where the inspection problem is.

*“A reactor beamline in a smaller box was never the goal.”*

## A second view of the same part

An NDT engineer might use X-rays to map the metal in a sealed assembly, then use neutrons to show where a fluid or seal sits inside it. A developer working on a hydrogen system might use one modality for the hardware and the other for hydrogen or water. Neither image is better. Each answers a different question.

For decades, that second image has meant sending a part to one of a few specialist sites. Compact neutron generators, efficient detectors and native-digital imaging now offer a way to change that model.

If we succeed, the most important change may not be any single Neutronis specification. It will be that, when an X-ray image leaves an NDT engineer with an unanswered question, asking for a neutron image no longer sounds exotic. It will simply mean reaching for another tool.



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# Making the Right Connections

## Marybeth Miceli on Technology, People and NDT





With more than three decades of experience spanning infrastructure engineering, nondestructive testing, structural health monitoring, technology consulting, and business leadership, Ms. Marybeth Miceli has worked at the intersection of technology and real-world infrastructure challenges. As President of Miceli Infrastructure Consulting she has focused on helping asset owners make informed decisions through actionable inspection and monitoring data. She is also the co-founder of the We-NDT Marketing Network and Executive Director of the Nondestructive Testing Management Association, dedicated to Advancing the Business of NDT. In this interview with OnestopNDT, she discusses technology selection, structural health monitoring, NDT workforce challenges, infrastructure inspection, digital technologies, and the importance of collaboration across the NDT ecosystem.

**Q: Ms. Miceli, welcome to OnestopNDT—it's a pleasure to have you with us. With more than three decades of experience spanning infrastructure engineering, NDT, technology consulting, and business leadership, could you share how your journey evolved into your current role as President of Miceli Infrastructure Consulting?**

**A:** Miceli Infrastructure Consulting was the first business in this space that I founded. When I was working as the Chief Operating Officer of a start-up, Material Technologies, I was meeting with bridge owners and other asset owners on a regular basis. At this time, structural health monitoring was really just starting to become more accepted in the industry. However, owners did not know how to utilize structural health monitoring to get the answers that they really needed. So, I decided to start my own company to help bridge owners and technology providers get on the same page about obtaining actionable data from structural health monitoring so that they could make real decisions about their bridges to either assess damage or extend the service life of their structure in a meaningful way.

**Q: Through Miceli Infrastructure Consulting, you work closely with asset owners, technology manufacturers, and service providers. When an owner faces a structural challenge, how do you determine which inspection or monitoring technology is actually appropriate for their needs?**

**A:** When working with asset owners, I always advocate for a backwards approach, which may sound strange. But I encourage owners to start by determining what data they need in order to make the best decisions for the challenges that they're facing and then, from there, figure out which systems can most efficiently and effectively give them the accurate data that they need. When I first started the business, many owners were simply trying out different systems to see how they worked, which ended up using a lot of funding and not getting a lot of real results for their structures.

**Q: Your approach emphasizes using technology for a specific purpose rather than adopting technology simply because it is new. What factors should asset owners consider when evaluating an emerging NDT or structural health monitoring solution?**

**A:** It's really all about what data you need and what challenges you are facing. Are you doing testing to meet a certain specification or standard? Are you worried about the condition of your structure? Are you trying to make sure your structure remains safe while planning a replacement or a rehab? There's a list of questions that we ask our asset owners when we start working with them to determine which technology, or usually group of technologies, will get them the answers they need in the most cost-effective way possible.

**Q: You have worked extensively with advanced NDT, structural health monitoring, materials testing, and remaining-life assessment. How do you see these technologies complementing one another in modern infrastructure management?**

**A:** In order to get the full picture about your structure's condition and performance, all of these things work together. Advanced NDT will give you a snapshot in time about the condition of your structure, whereas structural health monitoring will give

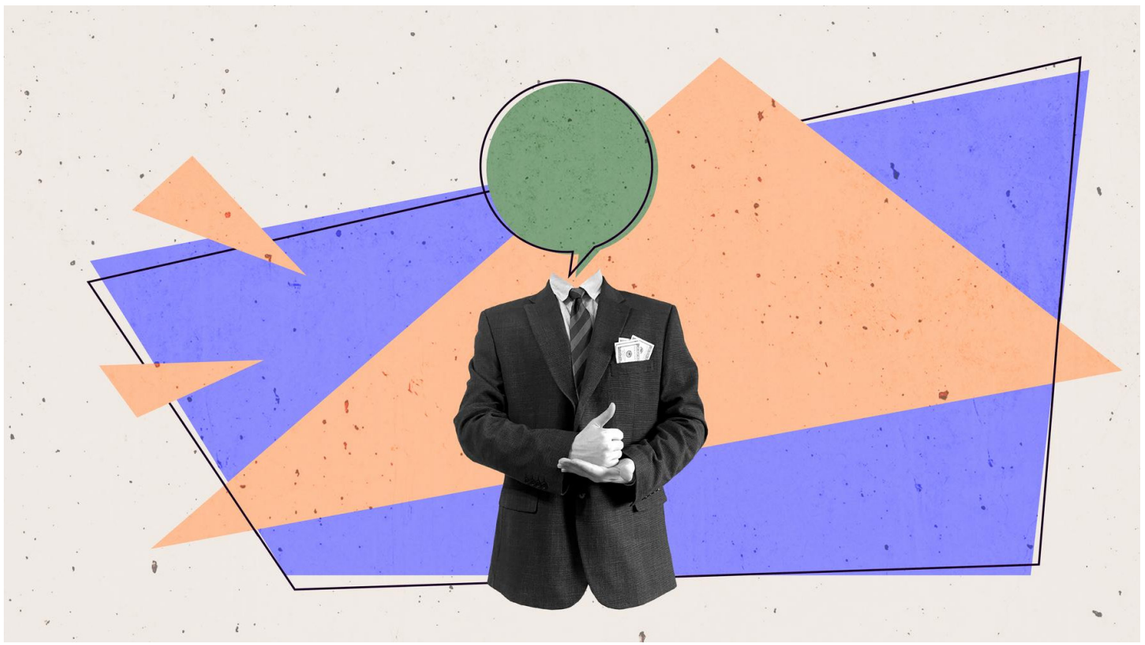
you an idea about the performance of your structure under loading conditions. But in order to understand how those affect the structure, you need to understand the material properties through materials testing. For example, knowing the actual fracture toughness of the material that was used in a structure allows you to see how resistant it is to fatigue cracking, and this allows you to see how to categorize it when you are trying to determine remaining life.

**Q: Infrastructure owners often have to balance deterioration severity, available budgets, access limitations, and life-extension requirements. How can they make inspection and monitoring decisions that deliver the greatest value over an asset's lifecycle?**

**A:** This is really all about making the right fixes at the right time. All of this testing can be used to determine what those fixes should be and when they should occur. A lot of asset management systems will incorporate deterioration modeling into their programs, and NDT and SHM can be incorporated to calibrate the model with real-world data. I have seen some state DOTs be very successful at utilizing deterioration modeling and rehab and repair scenarios in order to show legislators how investing a little bit more now in the right fixes ultimately saves the state and the taxpayers a lot of money later on. By illustrating this in a simple manner, states have been able to help justify increases in gas taxes and other revenue-generating legislation to show they are responsibly using the money.

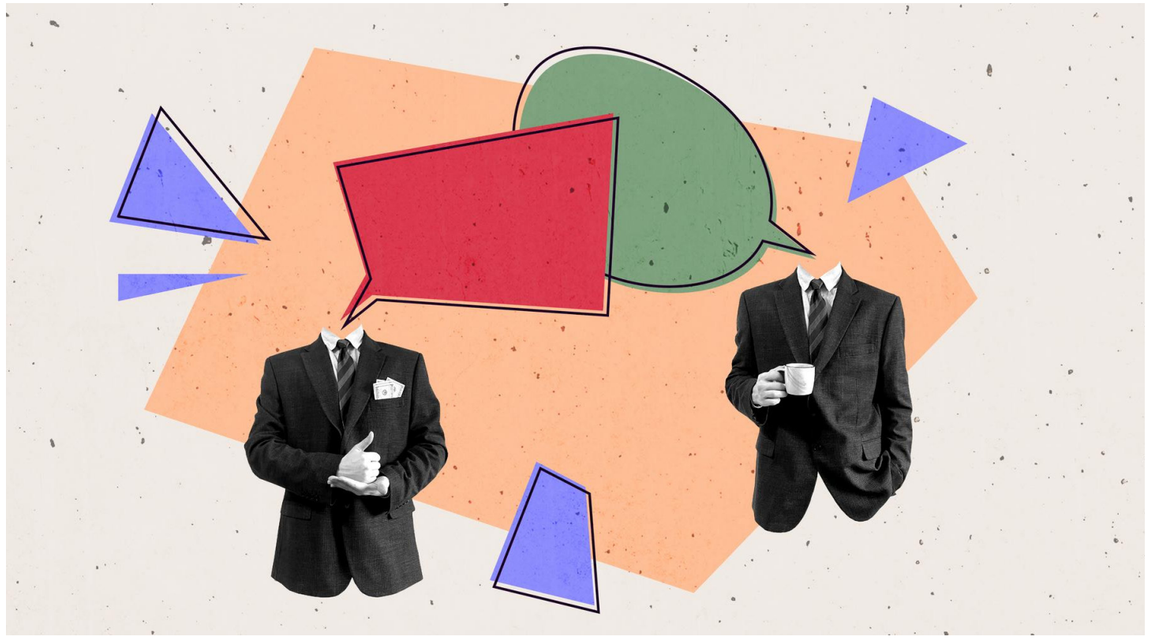
**Q: Your experience includes failure analysis and remaining-life assessment, as well as work on major structures such as the Empire State Building antenna, Miller Park, transit infrastructure, and signature bridges. How have these experiences shaped your understanding of the relationship between inspection data and real-world structural decision-making?**

**A:** A lot of the work that I've done on remaining-life assessment has to do with fatigue cracking in various structures. The work done at Lehigh University to categorize weld details and model fatigue crack growth has been key in determining remaining life for many different steel structures, including bridges, trains, and buildings. I love how we can instrument a structure with strain gauges and be able to see the exact number of cycles on these weld details under real loading conditions and then extrapolate remaining life from that. That's an example of materials testing, NDT, structural health monitoring, and remaining-life assessment all working together to help engineers and managers make responsible decisions now as well as plan capital improvements for the future.









**Q: As Executive Director of the Nondestructive Testing Management Association, you work closely with professionals involved in managing NDT personnel, technology, and regulatory requirements. What are some of the biggest management challenges facing the NDT industry today?**

**A:** It's not a new problem in the NDT industry, but it's continuing to get worse as more NDTers continue to retire. We need more technicians, and not just warm bodies pushing probes. We need technicians who understand the different methods and what a signal really means, where to look for problems, and what the codes and standards say about it. We need better on-the-job training and guidelines for what that should entail. We have a lot of guidelines on the classroom education side of certification but very few guidelines about what the OJT should look like. Is the technician carrying equipment or actually learning something? And this is not a problem that's going to be solved by one solution. It's not just apprenticeship, or specialized OJT facilities, or automation, or AI data processing, or marketing to get more techs—it's all of those things.

I'm so proud to say that NDTMA is working on all of these things in order to move the needle on this problem. We are fostering collaboration between groups that certify and govern NDT, such as API, ASNT, CINDE, AWS, AMPP, EPRI, ASTM, and more. We are producing successful videos aimed at teens to spark their interest in NDT as an exciting career. We have established an Education Forum to directly connect educational organizations in the space with service providers to establish and address gaps. The focus of this year's NDTMA was on AI and automation to take a hard look at opportunities and challenges. We are actively working to advance the business of NDT, and we are committed to continuing this hard work because it's so important.

**Q: You also serve on the ASNT Foundation Board of Trustees and have contributed to committees focused on infrastructure and bridge testing. From your perspective, where is greater collaboration needed between standards organizations, technology developers, NDT professionals, and asset owners?**

**A:** In terms of the infrastructure sector, we are really lacking meaningful NDT certification. Dr. Glen Washer performed a POD study, taking technicians from other industries and bringing them to the bridge industry to assess if inspectors certified in accordance with TC-1A could go from oil and gas or aerospace to the bridge industry, and the answer was a resounding no. Without industry-specific certifications, the bridge sector will continue to lag behind in terms of requiring ASNT-certified technicians. Additionally, we utilize different methods in infrastructure

such as GPR, Infrared Thermography, and LiDAR, for which there are no certification standards available. ACI has started developing some of those, but in general, we are still relying on licensed professional engineers to sign off on inspections when they are not required to have any NDT knowledge to obtain that license.

It's a significant disconnect in this sector.

**Q: Through your work with We-NDT Marketing Network, you have focused on strengthening the visibility and business value of NDT. Why do you think communicating the value of NDT effectively remains important for the industry?**

**A:** NDT is often seen as an "added expense". I once had a bridge owner tell me they didn't want to test their bridge because they, "have too many problems they already know about, why would I want to find more?" And they weren't joking, unfortunately. Communicating the ultimate value of NDT to engineers and managers is the only way we will stop this "low bid" world we find ourselves in. We either need to change the requirements by potentially using AI to help ensure quality on projects, or we need to clearly show numbers that indicate what happens when inspections are done by the lowest bidder instead of the most qualified. There's a happy medium somewhere in there, but when it comes to public safety, profit cannot be the only deciding factor.



**Q: You have experience working with both technology providers and infrastructure owners. What can technology developers do differently to ensure that their solutions address actual field requirements and gain greater acceptance among asset owners?**

**A:** For bridge owners, the fewer people we have to put in work zones, the better. Companies are using augmented reality, drones, digital twins, crawlers, automated sounding vehicles, and more to help people inspect more remotely. Some of these technologies can be accepted within the current standards, but some face uphill battles, and technology manufacturers need to be very aware of the codes, standards, and legislation that govern these kinds of solutions in each state. Also, adoption in the infrastructure space is often slower than in other sectors, which is why we advocate for what I've coined as "parallel technology transfer". We take proven technology solutions from other industries and bring them to the bridge industry to speed up the adoption process.

**Q: On a personal note, with your involvement across consulting, industry organizations, infrastructure projects, and technology initiatives, how do you like to spend your time away from work? Do you have any hobbies or interests that help you unwind?**

**A:** I love spending time with my husband, Damien, my 16-year-old son, Sammy, and my 13-year-old daughter, Mary Leigh. In fact, we all do taekwondo together—Sammy and I are 5th-degree black belts, and Damien and Mary Leigh will be testing for their 5th-degree black belts in the fall. I also lift weights, sing and play my flute in the church choir, volunteer teaching taekwondo and self-defense at an all-girls school, and read fiction novels.





**Q: Having worked across engineering, business development, technology transfer, and leadership, what advice would you give to professionals who want to build a career at the intersection of NDT, infrastructure, and emerging technology?**

**A:** Now is a great time to get into this field because, as the old guard is starting to retire, we are seeing more openness and even excitement to use technological solutions in the space. We now have a generation who has only ever known a digital world, and they want their infrastructure to be sensitized and managed just like our cars and homes are digitally optimized. Of course, that brings up some significant security and IT challenges, but Gen Y and Gen Z will not sit around and rely on older, less effective methods when they see the proof of more cost-effective life-cycle management in everything else around them.

**Q: Finally, platforms like OnestopNDT aim to bring together NDT professionals, technology providers, researchers, and asset owners to exchange knowledge and stay informed about industry developments. From your perspective, how valuable are such platforms in accelerating technology adoption and strengthening collaboration across the NDT community?**

**A:** Certainly, open-source platforms such as OnestopNDT, NDT.net, Quality Magazine, and of course, NDTnow.com are the backbone of open communication in the NDT industry. Bringing emerging technologies, case studies, and news stories to everyone worldwide with just a few clicks has revolutionized how information is exchanged in the NDT industry. Sometimes it results in information overload, but these platforms are making the information accessible to managers, engineers, and NDTers alike in a neutral way, where people can access a variety of solutions to their challenges and often engage with technology providers directly to help solve their problems from anywhere in the world. This kind of collaboration is exactly what the NDT industry needs to move the industry and public safety forward.

*Throughout the conversation, Ms. Miceli highlights the importance of using NDT and structural health monitoring as decision-making tools rather than simply adopting technology for its own sake. She also emphasizes the need for stronger NDT competency, industry-specific certification, collaboration, and responsible adoption of emerging technologies. As infrastructure moves toward increasingly digital and data-driven asset management, her insights underline the importance of connecting technology, expertise, and practical field requirements to improve safety and extend asset life.*



Cover Story

Waygate Technologies

# From AI Promises to Proven Performance:

## How Denoising in Computed Tomography is Delivering Real Value in NDT

*Why validation matters: AI postprocessing for Industrial CT*



# Cover Story



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AI has become one of the most talked-about topics – and inspections are no different. At nearly every conference these days, you get the impression that about half of the presentations deal with AI in some form. Given its potential, this attention is not surprising, but at the same time, the widening gap between the promises and the effort it takes to make it work in day-to-day operations is becoming increasingly concerning.

In most consumer applications, an AI mistake is a minor annoyance - if a photo app blurs something incorrectly, no one is harmed. But most people have already encountered AI mistakes, whether it's a chatbot inventing facts, a search tool delivering inaccurate information, or AI-generated images blurring the line between real and fake. These examples highlight a broader challenge: trust. If users cannot reliably judge when AI is right or wrong, confidence in the technology quickly erodes. In Non-destructive Testing (NDT), critical parts are typically examined, and if an inspection misses a defect, the consequences can be severe, ranging from a costly recall to something far worse. Therefore, trust in inspection results is key. This is why the industry needs to be careful in separating genuine innovation from claims that sound convincing in a presentation but don't survive contact with a real inspection challenge.

## What AI Overpromising Looks Like in Industrial Inspection

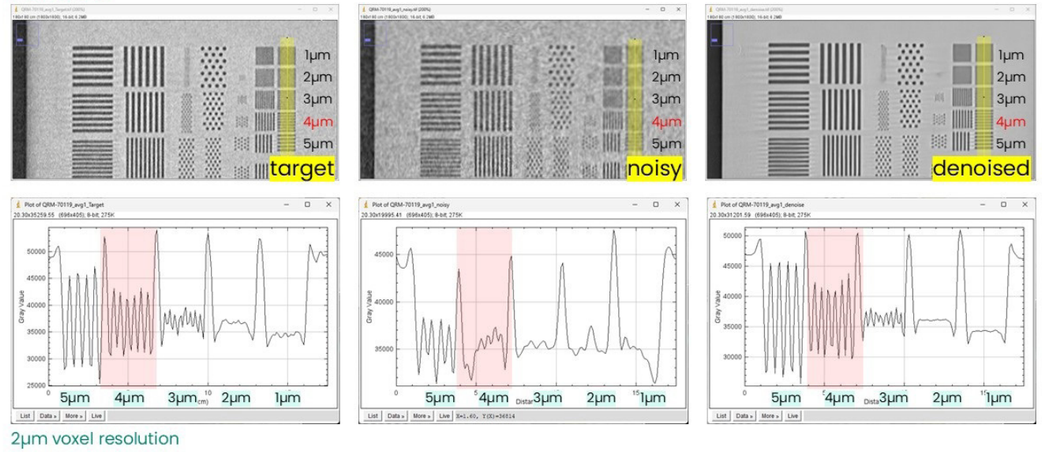
At this point, it is important to define the concern more precisely. The issue is not that AI is absent – there are a lot of solid AI projects in our field. The bigger issue is overpromising and oversimplifying, presenting AI as if it solves every inspection challenge immediately, without complication.

A good example where this happens is Automated Defect Recognition, or ADR. For several years, ADR has been the most attractive selling point in the industry. The idea is easy to explain to a customer: instead of an operator deciding whether a part is good or bad, an algorithm makes that decision automatically. It is a relatable story. It is also a promise that is genuinely difficult to deliver on. Today, ADR algorithms can be developed for almost every inspection task. But in practice, they are highly application- and workflow-specific, which makes them difficult to transfer from one use case to another. If they are set up properly, they can be extremely valuable. But setting them up and maintaining them requires significant effort and investment, so the cost-/benefit equation is not always attractive for every application.

Automatically detecting defects in various application areas is difficult because each application is unique. A solution designed to detect particles in a battery cannot simply be applied to a crack in a turbine blade or a void in a printed circuit board. Each case requires its own training data, its own validation measures, and its own understanding of the customer's specific conditions. Usually, it is unrealistic to present a single AI solution as the answer to every inspection challenge. If something sounds too good to be true, it probably is.








*AI-powered CT denoising helps reduce image noise while preserving the inspection-critical details needed for reliable defect detection.*

## AI Is Just a (Very Powerful) Tool

It is useful to regularly step back and clarify what AI actually is. AI is a tool, a piece of technology - on its own it does not solve anything. But when deployed responsibly, AI can enhance inspection workflows by reducing the burden on inspectors, enabling faster scans, greater throughput, and more efficient use of human expertise. The real question is always what problem you are trying to solve, and how much you are prepared to invest in solving it.

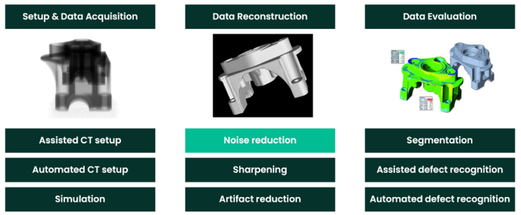
Building a working AI solution takes a lot of training data, careful engineering, and ongoing validation, and none of that comes cheap. This means a solution provider has to choose carefully where to put its resources. Usually, an investment is justified when the resulting technology has a wide application horizon. With enough investment, you can technically build a solution for almost any specific defect on almost any specific part. Whether that investment pays off is a different question, especially as customers increasingly want to keep their defect data in-house and are investing in their own data science teams to develop specific, customized AI models. That is one of the reasons a recent development by Waygate Technologies focused on something that works across applications: denoising in computed tomography or 'CT denoising'.

## A Practical Example: AI-Powered CT Denoising

CT inspection is expensive, and system utilization and throughput are a major cost driver. The faster a part can be scanned, the lower the cost per scan. The catch is that scanning faster usually comes at the cost of decreased image quality by introducing additional noise, which can obscure the very defect the inspection is meant to detect.

As a long-standing solution provider with deep application expertise and access to large volumes of real-world CT data, Waygate Technologies developed a denoising model that learns how the noise behaves and reduces it while keeping the relevant information intact. This is different from traditional filtering or image smoothing, which tends to blur the whole image. The goal was to remove the noise without touching the information a CT scan actually contains, so a fast, noisy scan becomes just as usable for inspection as a slow, high quality one.

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*The future of AI in NDT is about giving inspectors better tools to work with.*

## Validation Before Commercialization

The value of AI depends on evidence, not promises. AI can be approached from many different angles, and there are several technical routes to solving a given inspection challenge. When we began developing this technology a few years ago, we deliberately explored different avenues, tested what was technically possible, and discarded approaches that did not prove reliable enough. Only through extensive validation did we identify the most robust path forward and ensure that the technology reduces noise without obscuring relevant inspection information.

Since then, the team has run extended feasibility studies and validated the results against quantitative image quality measures defined by societies like ASTM. These measures make it possible to compare a scan before and after denoising in objective terms. Numbers alone only tell part of the story, so the engineers complemented this with case study after case study, comparing a standard scan, a fast standard scan, and the denoised fast scan side by side, and having experienced inspectors judge whether the defect they were looking for was still visible.

## Evidence from Multiple Industries

The developed denoising technology is CT specific, so it only works with CT data, but it is industry and part type independent. It got tested for a wide range of application spaces, such as electronics, aviation, material science, casting, additive manufacturing, and EV battery inspection, and in each of these areas the team saw a real benefit for the customer.

To give a sense of scale, in casting inspection, where the goal is often to detect safety critical porosities and foreign particles, the trials have shown scan time improvements of around a factor of three without having an impact on the detectability of these defects. Figures like this will vary depending on the application and on what exactly is being inspected for, but they give a realistic sense of what becomes possible once the noise is properly removed rather than simply smoothed over.

## Why Responsible AI Will Win

The future of AI in NDT is not about replacing the expertise of inspectors, it is about giving them a better tool to work with. AI by itself is not a standalone solution, and success always starts with defining the right problem.

What can be seen is that more and more customers are looking for validated, trusted AI capabilities rather than the biggest promise. Progress in this field will come from close collaboration between developers, data scientists from both sides, and the inspection experts who understand the parts and the defects on a daily basis. Our industry should move away from asking “does it use AI?” and start asking “has it been proven to work for my inspection challenge?”

## Partnering for Trusted AI in CT Inspection

Over the past six months, we have conducted a pilot phase for our CT denoising technology, working with a dozen customers from various industries, including several global leaders in fields such as electronics and battery manufacturing. Every month, we hold roundtable discussions in which our engineers, our customers and l participate to evaluate performance and discuss the findings they have observed.

There is a wide variety of AI technologies, but the key is to understand what you can expect from them for your specific use case – and, above all, where the limitations lie. Because if you’re looking for a very specific defect or a very specific conclusion from your data and want to know whether this will work or not, we need to work together to determine where the limitations lie. We work together to identify the challenges and then find the best approach to minimize them. It really comes down to trust and collaboration, because there will never be a one-size-fits-all solution. We have to be closely connected to our customers to understand this technology and then realize its benefits.

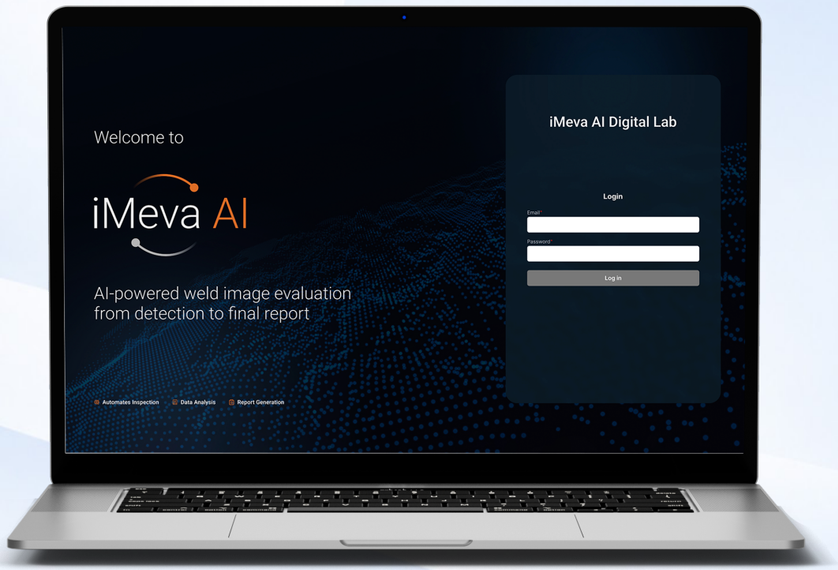
That’s why we took our time to really understand what we are bringing onto the market. You have to be able to really trust the technology, and the only way to get there is to thoroughly test and validate it.

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# iMeva AI: Beyond image acquisition

How AI-assisted evaluation is transforming radiographic interpretation from image analysis to final reporting






Digital radiography has changed the way industrial radiographic testing is performed. Direct image acquisition eliminates film processing, makes results available immediately after exposure and gives operators greater control over imaging parameters and subsequent analysis.

But faster acquisition is only one step toward a truly significant productivity boost. Once a radiograph has been obtained, one of the most demanding stages begins: interpretation. A specialist must examine the weld for relevant indications, classify and measure findings, determine their location and document the results. As working volumes grow, this creates a practical bottleneck. Throughput remains closely tied to the availability and experience of qualified personnel, while repetitive analytical work can contribute to variability between evaluations.

Assisted Defect Recognition (ADR) introduces automation at precisely this stage.

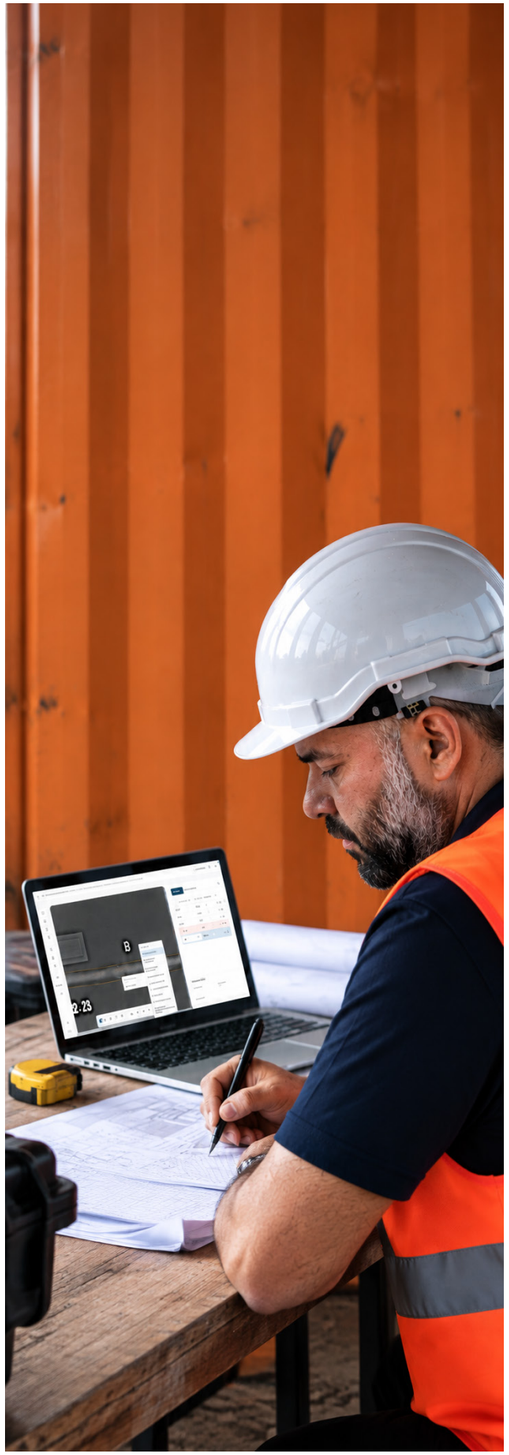
*Developed by DR SYSTEMS specifically for digital radiographic inspection of welded joints, iMeva AI uses Computer Vision and Deep Learning to support the evaluation process from initial image analysis to final report generation. The objective is not to remove the qualified specialist from the process, but to automate routine operations and provide structured results for expert review.*

## From radiograph to evaluation

iMeva AI processes the image as a sequence of interconnected steps. DCM data and associated metadata are first validated and correlated. The software then identifies the weld contour and measuring belt, establishing the area in which subsequent analysis will be performed.

Then, the system searches for indications and determines their type, dimensions and coordinates. The findings are presented to the operator through an interface that provides filters, measurement and visualization tools for closer validation. Rather than producing a fixed AI verdict, the system creates an editable evaluation that the specialist can examine, correct where necessary and approve. This distinction is fundamental to the role of ADR. Automation handles a substantial part of the repetitive image-processing work, while responsibility for the final assessment remains with qualified personnel.

After confirmation, the system can generate a well-structured testing report with all flaw findings and the Approved / Reject conclusion.



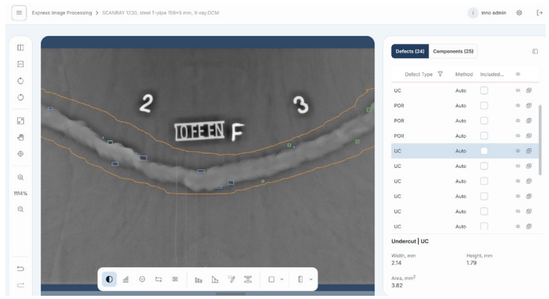



## Recognizing the indications that matter

iMeva AI currently supports 15 defect categories used in welded-joint evaluation. These include common indications such as porosity and cluster porosity, undercut, incomplete fusion, inadequate penetration, cracks, slag indications and tungsten inclusions, alongside other discontinuity types.

For each detected indication, the software determines its position and physical dimensions and assigns a classification. The evaluation is performed in accordance with ASME B31.3 using the selected acceptance criteria.

The purpose is not simply to highlight suspicious areas on a radiograph. Classification, measurement and localization are performed within the same workflow, allowing the information generated during analysis to be carried forward into the inspection record.



## What is behind the AI?

For any AI-based inspection technology, performance depends heavily on the data used to develop and validate the model. A large dataset alone is not sufficient: its relevance, annotation quality and verification are equally important.

iMeva AI has been trained on more than 380,000 labeled radiographic images, including over 120,000 defect samples representing a wide range of welded-joint indications.

The annotations follow a unified approach based on relevant industry codes and regulatory requirements. They are subjected to a three-stage verification process involving qualified operators, experienced Level III DR specialists and independent experts. This is intended to reduce inconsistencies in labeling and provide a reliable reference for model training.

Training and validation data are separated to provide an independent assessment of system performance. The qualification process involves thousands of radiographs, with results reviewed and cross-validated by NDT experts. Following each model retraining cycle, particular attention is given to validation performance before the updated model is introduced.

The dataset continues to expand as additional testing material becomes available, providing a basis for further refinement of detection and classification performance.

## From automation to measurable results

The practical value of ADR becomes clearer when the complete evaluation cycle is considered.

In the performance data collected over the years in many countries, conventional manual evaluation typically takes approximately 15-20 minutes per joint. Automated processing with the software reduces the average evaluation time to around 2-3 minutes.

The resulting difference becomes particularly significant in high-volume projects. Compared with approximately 30-50 joints processed per shift through conventional evaluation, workflows supported by iMeva AI can reach 150-200 inspection reports per day. Report generation, which can otherwise extend the process considerably, is performed automatically once the results have been reviewed.

The system has demonstrated defect classification accuracy of up to 96% and detection of indications starting from 0.1 mm under applicable inspection conditions.





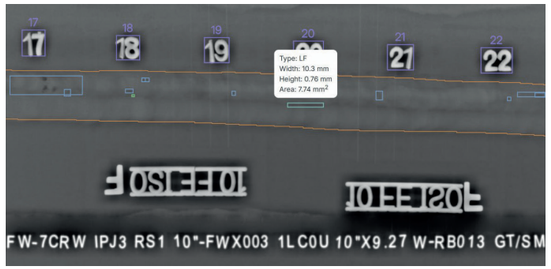
These improvements do not come from accelerating one isolated operation. Time is saved across several stages that would otherwise require long manual input.

## Performance across different inspection conditions

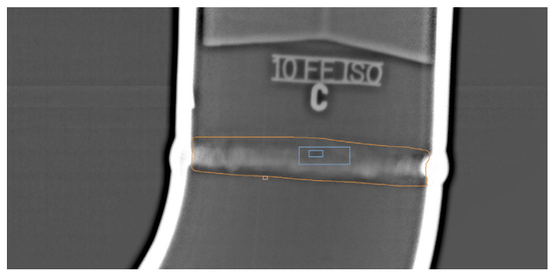
Radiographic inspection is rarely performed under a single standardized field setup. Pipe diameter, wall thickness, radiation source, exposure technique and image quality can vary considerably between applications.

To illustrate the software in practice, two cases with contrasting testing parameters are presented below.

In one case, a 10-inch steel pipe with a wall thickness of 9.27 mm was inspected using the SCANRAY 1025F DR system, Comet EVO 200D X-ray source and the DWSI technique. Image quality of W14 (0.160 mm) was achieved. iMeva AI automatically recognized the weld and measuring belt and detected multiple indications, including lack of fusion, slag inclusions and several types of porosity, with measured dimensions ranging from 1.1 × 1.1 mm to 2.2 × 2.2 mm.




A second case involved a 3-inch pipe with a wall thickness of 5.49 mm, inspected with the SCANRAY 1230 DR system, an Ir-192 source and the DWDI superimposed technique. At an achieved image quality of W13 (0.200 mm), the software identified and measured undercut and internal concavity. iMeva AI follows the approach that a truly universal industrial ADR solution cannot be tied to one idealized inspection setup; it must remain effective across the varied inputs encountered in routine inspection work.



## Turning analysis into a structured inspection record

Finding an indication is not the end of the inspection process. Results still need to be documented in a form that connects image evaluation with the inspected object and acquisition conditions.

iMeva AI automatically generates a structured report containing weld identification, object and testing parameters, imaging conditions, as well as detected indications with their classifications and physical locations. Because the findings remain editable throughout the review stage, the report reflects the specialist's decision rather than an unverified AI output.

For larger organizations, this structured approach also creates a basis for centralized statistics, archives and traceability of user actions, rather than leaving evaluation data distributed across individual workstations and separate documents.

## From a single workstation to enterprise deployment

The way ADR is introduced into an inspection organization depends on the scale and structure of its operations.

For standalone use, the iMeva AI Box Solution provides automated image evaluation and reporting on a local workstation without requiring complex additional infrastructure. It is intended for teams that need a ready-to-use environment for daily inspection work.

The Enterprise Solution uses a server-based architecture for organizations managing multiple users, projects or locations. It adds centralized data management, role-based access, synchronization, task management and options for integration with external systems.

In both configurations, sensitive testing information will always remain within the customer's own infrastructure rather than being transferred to external AI services. This is particularly relevant where radiographic data are subject to project-specific confidentiality or security requirements.

## Bringing progress into practice

Digital radiography has already transformed how inspection data are acquired, accessed and managed. The next opportunity lies in making better use of the information those images contain.

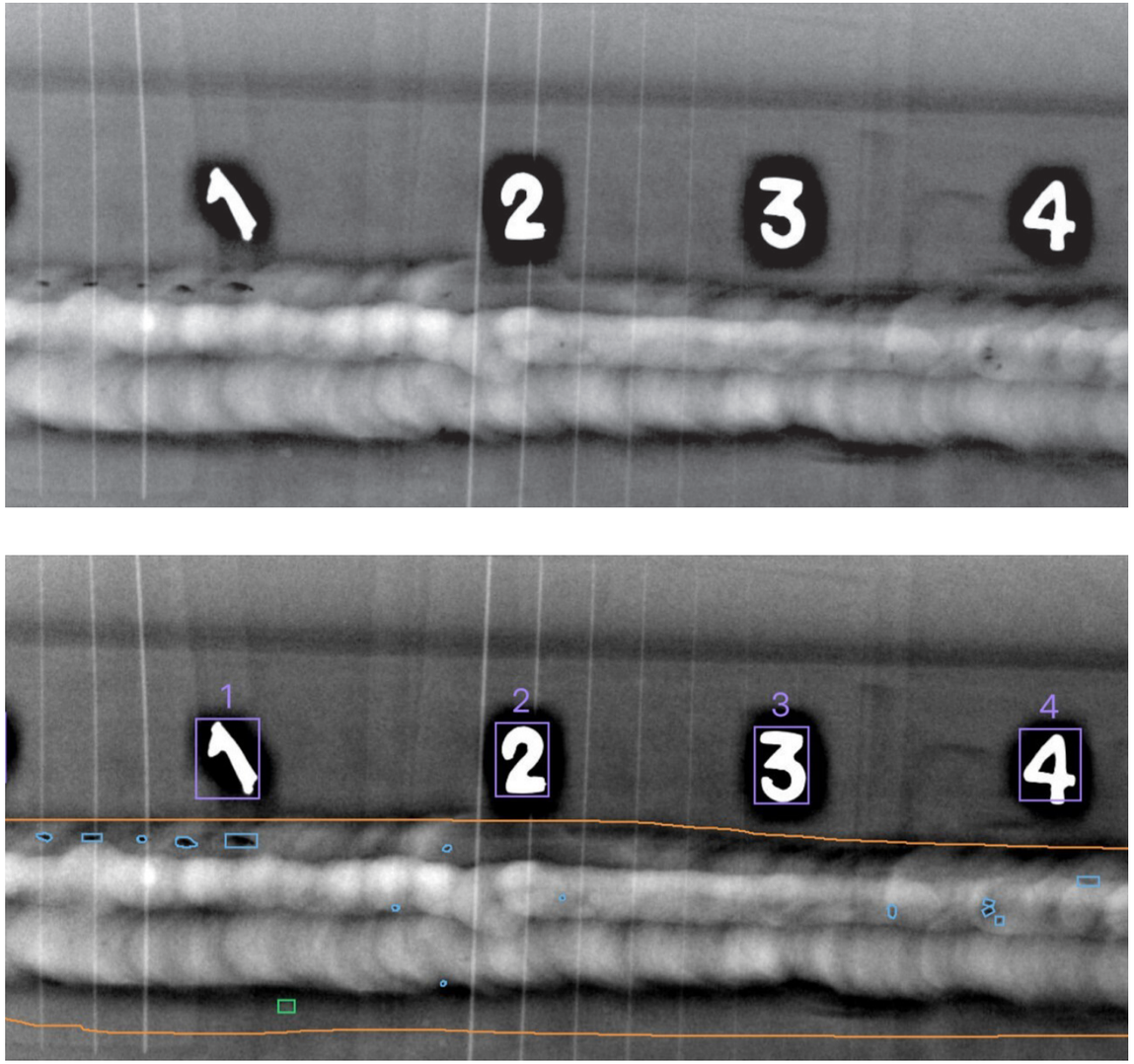
iMeva AI by DR SYSTEMS takes this process further by bringing AI-assisted evaluation into everyday radiographic inspection. Instead of treating artificial intelligence as a future capability, it applies it to a working environment

where image analysis and reporting can become faster, more consistent and easier to scale.

This marks another step in the broader digitalization of NDT. As inspection volumes grow and industrial processes become increasingly data-driven, progress will depend not only on acquiring high-quality images efficiently, but also on turning them into useful results with less manual effort.

By bringing these capabilities into practical use today, iMeva AI advances the way radiographic evaluation is performed and moves the industry closer to a more connected, automated and efficient approach to non-destructive testing.

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iMeva AI

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NDT Conversations

# The Move Toward Intelligent Inspection:

## Mr. Tarin on Thermal Imaging and Continuous Monitoring



**Markus Tarin**
*President & CEO*
MoviTHERM

NDT Conversations

*In this exclusive conversation with OnestopNDT, Mr. Tarin, an entrepreneur with a background in embedded systems, industrial automation, and infrared imaging, discusses his journey from manufacturing and plant operations to building moviTHERM. He shares his perspectives on thermal imaging, AI-powered inspection, industrial innovation, technology partnerships, entrepreneurship, and the future of condition monitoring.*

**Q: You have experience working with both technology providers and infrastructure owners. What can technology developers do differently to ensure that their solutions address actual field requirements and gain greater acceptance among asset owners?**

**A:** I trained in Germany in radio and television engineering and embedded system design, graduating in 1996. That background is less exotic than it sounds — it's fundamentally about signals, sensors, and turning raw data into something a human can act on. That's still what I do.

I came to the U.S. and spent three years in textile manufacturing in Los Angeles, first commissioning and automating what was, at the time, the world's largest continuous dyeing range, then running the plant's maintenance and engineering operation. In 1999, I started moviTHERM as an engineering consultancy — custom software and product development. Clients kept bringing me imaging problems, and increasingly, those problems lived outside the visible spectrum: things you cannot see but can measure as heat.

I didn't set out to build a thermal imaging company. I followed the problems. What kept pulling me toward infrared was that it answers questions no other sensor answers cheaply — is this bearing failing, is there a fire starting inside that pile, is there a void under that composite skin? Once you see how much decision-making value sits in a temperature signature, it's hard to work on anything else.

**Q: moviTHERM has grown into a company delivering solutions from infrared NDT and package inspection to AI-powered IoT monitoring for early fire detection. What vision has guided this evolution, and how have customer needs influenced your innovation roadmap?**

**A:** The vision hasn't changed much in 27 years: take complicated imaging science and make it deployable by people who are not imaging scientists. Thermal imaging has always worked. The barrier was never physics — it was integration. A customer would buy a good camera and then discover they'd bought a component, not a solution. They still needed someone to handle optics selection, calibration, analytics, alarm logic, networking, and the thousand small decisions that separate a demo from a system that runs for five years in a dusty yard.

Our roadmap is written almost entirely by customers. Nuisance alarm filtering exists because operators told us they were ignoring alerts. Environmental sensing exists because a customer needed wind data to interpret a hot spot. Industrial protocol connectivity exists because plants wanted the data inside their existing control systems, not in yet another dashboard.

The discipline is separating what one customer wants from what the market needs. We built the second. If three unrelated customers describe the same pain in different words, that's a product. If one customer describes it, that's a project — and we'll do the project, but we won't confuse it with a roadmap.

**Q: In your experience, what advantages does thermal imaging offer over traditional inspection approaches in industrial environments?**

**A:** Four things, mainly.

- **It's non-contact and it works on energized equipment.** You inspect a live switchgear cabinet or a running motor without shutting anything down. That alone changes the economics.
- **It's full-field, not point-based.** A contact probe gives you one temperature at one spot. A thermal camera gives you tens of thousands of measurements at once, so you find the problem you weren't looking for.

- **It sees energy, not appearance.** A visual inspection tells you what a surface looks like. Thermal tells you what's happening underneath — a loose connection, a failing bearing, a void in a composite, moisture in insulation.
- **It's inherently continuous.** Most traditional methods are events. You schedule them. Thermal can simply run all the time, at a cost per hour that no manual method approaches.

I'll be honest about the limits too, because overselling this technology has hurt our industry. Emissivity matters, reflections lie to you, and a thermal image is not a diagnosis — it's evidence. Anyone who tells you infrared replaces every other method is selling, not engineering. It's a powerful screening and monitoring tool, and it works best alongside ultrasound, vibration, and visual inspection, not instead of them.

**Q: Your solutions combine thermal imaging, machine vision, cloud connectivity, and artificial intelligence. How do you see these technologies working together to redefine the future of industrial inspection and asset monitoring?**

**A:** Each one solves a different part of the same problem, and none of them is sufficient alone.

Thermal gives you the physical signal. Machine vision gives you context — where in the frame this is happening, and what object it's happening to. AI gives you discrimination: separating a real developing fault from a sun reflection or a forklift driving through the scene. Cloud gives you distribution — the right person knowing at 2 a.m. without being on site.

The important architectural point is where the intelligence sits. We run detection at the edge, on-premise, because a monitoring system that fails when the internet fails isn't a monitoring system. The cloud is a visibility and management layer, not a dependency.

Where I think this genuinely redefines things is in the shift from inspection as an event to monitoring as a condition. Historically, you inspected something on a schedule and hoped nothing happened in between. When sensing is continuous and the analytics are good enough to be trusted, the question changes from "what did we find during the survey" to "what is changing right now, and how fast." That's a different discipline, and it's where the field is heading.

**Q: Why is continuous thermal monitoring becoming increasingly important for industries operating critical infrastructure?**

**A:** Because failures don't wait for the inspection schedule.







Take a recycling facility. Route-based thermography might survey the yard monthly, maybe weekly. A lithium-ion battery buried in a pile of material can go from ambient to ignition in a matter of hours. The odds that your quarterly survey lands in that window are effectively zero. The inspection wasn't wrong — the sampling rate was.

The same logic applies to electrical assets, motors, bearings, and transformers. Thermal degradation is a trend, not a state. One reading tells you a temperature. A continuous record tells you a direction, and direction is what lets you intervene before failure instead of documenting it afterward.

There's also a hard economic driver right now. Insurance carriers in several of the industries we serve have raised premiums sharply or withdrawn coverage entirely after fire losses. For some facilities, demonstrable continuous monitoring has become a condition of staying insurable. That has moved this from a nice-to-have engineering upgrade to a business-continuity requirement, and it happened faster than most people expected.

**Q: How do you transform an innovative concept into a commercially successful solution while ensuring it addresses real industry challenges?**

**A:** The failure mode I see most often — and I've been guilty of it — is engineers building the thing that's technically interesting rather than the thing someone will pay for.

*My rough process:*

**1. Start with the pain, not the technology.** Go to the site. Watch how people actually work. The gap between what a customer describes on a call and what you see on the floor is where the real product is.




**2. Validate that they'll pay before you build.** Interest is free. A purchase order is data. If a customer won't fund a pilot, that tells you something honest about the priority.

**3. Build the smallest version that solves the whole problem.** Not a partial solution done thoroughly — a complete solution done simply. A customer can't evaluate half a system.

**4. Deploy it somewhere hard and let it break.** Our field environments are dusty, hot, wet, and electrically noisy. Lab performance predicts nothing.

**5. Then engineer for repeatability.** This is the step most technical founders skip. A system that works because you personally configured it isn't a product. It's a hobby with an invoice.

The commercial test is simple: can someone other than the inventor sell it, install it, and support it? Until that's true, you don't have a product yet.

**Q: Before founding moviTHERM, you led manufacturing operations and automation initiatives as Plant Manager. How did those early experiences influence your understanding of quality assurance, process optimization, and industrial technology?**

**A:** Those three years shaped everything.

I started at a Los Angeles textile plant — about 650 employees — by installing and automating what was then the world's largest continuous dyeing range. I was later promoted to plant manager, running roughly 35 mechanical and electrical staff across three shifts, responsible for keeping the entire machine park running 24/7 for high-volume, time-critical production.

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*Three lessons stuck permanently.*

- **Downtime is the real currency.** When a continuous process stops, you don't just lose the hour — you lose material in the machine, you lose schedule, and you lose customer trust. Every product I've built since is aimed at buying the operator time before a stop, not explaining it afterward.
- **Formal beats are heroic.** I inherited a maintenance culture built on individual expertise — a few people who knew which machine made which noise. It worked until they were on vacation. Putting in a structured maintenance program and training the workforce was less glamorous than any automation project and delivered more.
- **Technology that operators don't trust is technology that gets bypassed.** I watched good systems get switched off because they alarmed too much or made someone's shift harder. That's why nuisance alarm filtering is not a feature to me. It's the whole game.

**Q: When selecting a technology partner, what factors do you believe matter most beyond technical specifications?**

**A:** Specifications are the easy part, and frankly, most serious vendors' specs are close enough that they're not the deciding factor. What separates them:

- **Application engineering, not just sales engineering.** Will they tell you when your application won't work? A vendor who has never talked a customer out of a purchase is not advising you — they're closing you.
- **Who shows up when it breaks.** Not "is there support" — everyone has support. Ask who physically comes to the site, how fast, and whether they know your installation. Ask for a reference from a customer who had a problem, not a customer who didn't.
- **Longevity and continuity.** Industrial systems live ten to fifteen years. Will this company exist then, and will they still support this generation of hardware? I've watched customers stranded by acquisitions more often than by technical failure.
- **Willingness to be measured.** A partner who agrees up front on what success looks like — and on how you'll know if it isn't working — is a partner who intends to deliver it.

The underlying question is whether you're buying a transaction or a relationship. Multi-site industrial monitoring is unavoidably a relationship. Buy it that way.

**Q: You've worked with technologies spanning machine vision, motion control, medical product development, and infrared imaging. How has cross-industry experience helped you identify new opportunities for innovation?**

**A:** Almost every innovation I've been part of was a transplant, not an invention.

I've worked as lead architect on imaging projects across defense, aerospace, medical research, and industrial automation, and across the full spectrum — near, shortwave, midwave, and longwave infrared. What that teaches you is that industries solve the same problems independently and never talk to each other. Aerospace developed rigorous active thermography methods for composite inspection — lock-in and pulsed techniques — while general manufacturing was still doing spot checks with a handheld. Medical device development taught me a level of validation discipline and documentation rigor that most industrial products never see, and that discipline is exactly what earns trust in a safety-critical application. Machine vision solved the problem of making a camera make a repeatable pass/fail decision decades before anyone asked a thermal camera to do it.

So the useful skill isn't inventing something new. It's recognizing that a problem in front of you is structurally identical to one that was already solved somewhere else, in a field that doesn't attend your conference. Reading outside your industry is one of the highest-return things an engineer can do.

**Q: You've been an active member of Entrepreneurs' Organization and Vistage. How important is continuous learning and peer collaboration for CEOs leading technology companies?**

**A:** I spent four years in EO, where I mentored founders of early-stage companies, and about seven years in Vistage. Both were worth it, for a reason I didn't anticipate going in.

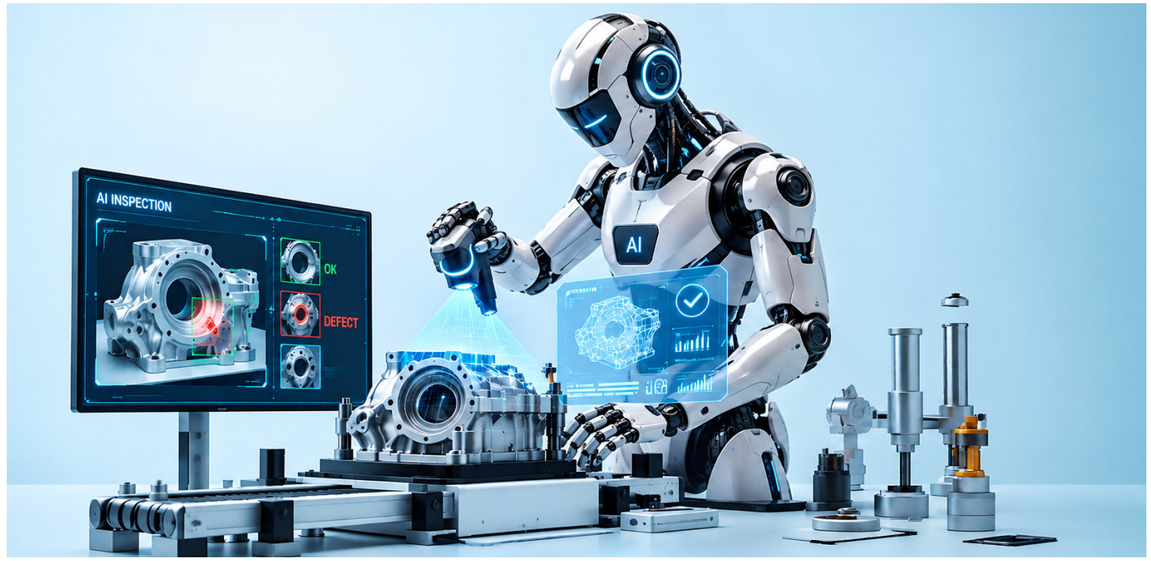
Technical learning was never the problem. Engineers are good at learning technology — it's what we do for fun. What I lacked was everything else: hiring, delegation, communication, building a team that performs without me in the room.

The single biggest change was moving away from micromanagement. As a technical founder, you're usually the best engineer in the building at the start, and that becomes a trap. You keep making every decision because you can make it faster and, at first, better. Then you become the bottleneck for everything, and the company can only grow to the size of your calendar. Peer groups are where I got that reflected back to me honestly — by people with no stake in flattering me.

The other value is simply that other CEOs have already made the mistake you're about to make. That's not something you can read. You need people who will tell you the unglamorous version of what happened to them.








**Q: Outside of leading innovative businesses, how do you like to spend your free time?**

**A:** Hiking, fishing, and adventure travel.

There's a common thread, and it's not subtle: all three take me somewhere without a screen and without a schedule. Fishing in particular is good for an engineer's brain. It's patient, it rewards observation over effort, and no amount of forcing it makes a fish bite. That's a useful counterweight to a job where the instinct is always to push harder on the problem.

The best product ideas I've had did not arrive at my desk. They arrived on a trail, three days into somewhere with no signal, when my brain finally stopped triaging and started connecting things. I've come to treat that as part of the work rather than time away from it.

Adventure travel does something similar at a different scale — it puts you in places where your assumptions don't apply, which is a healthy annual reminder for anyone who runs a company. And practically speaking, if you're going to lead a team over decades rather than years, you need something that genuinely refills the tank. Burnout is a slow failure mode. It looks fine on the trend line right up until it doesn't.

**Q: Looking ahead, how do you see artificial intelligence, automation, and predictive analytics transforming industrial inspection and condition monitoring over the next decade?**

**A:** Three shifts, in order of confidence.

**1. From detection to prediction.** Today, most systems, ours included, are very good at telling you something is wrong right now. The next step is credible time-to-failure estimation — not "this bearing is hot" but "this bearing's trend puts it outside tolerance in roughly three weeks." That requires long baselines of real field data, which is the actual moat in this business. Not the algorithm — the data.

**2. From alarms to autonomous responses.** Systems will increasingly act, not just notify: adjusting thresholds to conditions, dispatching suppression, throttling a process. That's technically achievable now. The gate is trust and liability, not capability, and it should be — we should earn that authority slowly.

**3. From specialists to everyone.** Interpretation has always required a trained thermographer. As analytics improve, the technology reaches facilities that could never justify a certified thermographer on staff. That's the largest market expansion in our field, by far.

What won't change: physics, emissivity, and the need for someone with judgment to decide what to do about the finding. AI is a very good screener. It's not accountable, and accountability is a human function.

**Q: For entrepreneurs and young engineers building technology companies in industrial automation or inspection, what lessons from your own journey would you consider most valuable?**

**A: 1. Work in the industry before you try to fix it.** My three years in a plant taught me more about what industrial customers need than any amount of market research would have. Take the operations job. It's not a detour.

**2. Sell before you build.** Falling in love with technology instead of the problem is the most common way technical founders fail. The market does not reward elegance.

**3. Industrial sales cycles are long — plan your finances around that.** Reliability has to be proven, and proving it takes seasons, not sprints. Undercapitalizing a long sales cycle kills more good companies than bad technology does.

**4. Reliability outranks features.** In our world, a system that does three things flawlessly for ten years beats one that does thirty things and needs attention. Customers remember downtime forever.

**5. Get out of your own way early.** Build a team that can execute without you sooner than feels comfortable. I waited too long.

**6. Be patient.** moviTHERM is 27 years old. There was no single breakthrough moment — just compounding. Very few overnight successes in industrial technology are actually overnight, and the ones that look like it usually had ten quiet years first.

**Q: From your perspective, how valuable are platforms like OnestopNDT in accelerating innovation, fostering collaboration, and increasing awareness of emerging inspection technologies?**

**A:** Very, and for a specific reason: our field's biggest constraint has never been technology. It's awareness.

There are plant engineers today solving problems the hard way because they don't know a method exists. The technique they need was published fifteen years ago in a conference proceeding they'll never encounter. NDT is unusually fragmented — the ultrasound community, the radiography community, the thermography community, each with its own conferences, journals, and vocabulary, often describing similar problems in mutually unintelligible terms. Platforms that cut across those silos do real work.

They also help buyers evaluate honestly. When a facility manager can compare methods and hear directly from practitioners, vendors have to compete on substance rather than on marketing volume. That's healthy, and companies with real technology should welcome it.

For a company like ours, it's simply how you reach an engineer with a problem you can solve. That's not a small thing — most of the value in this industry is lost in the gap between an existing solution and the person who needed it and never found it.

This is also why I spend time on education generally, including co-hosting The Thermal Review. The more people who understand what infrared can and cannot do, the better this whole industry performs.

*The conversation with Mr. Tarin highlights how the future of industrial inspection is moving beyond periodic checks toward continuous, data-driven condition monitoring. His experience also underscores an important principle for the NDT and industrial technology community: innovation is not only about developing more advanced technologies, but about making those technologies practical, reliable, and trusted by the people who use them.*

*To get your articles featured in OnestopNDT, contact us at* support@Onestopndt.com

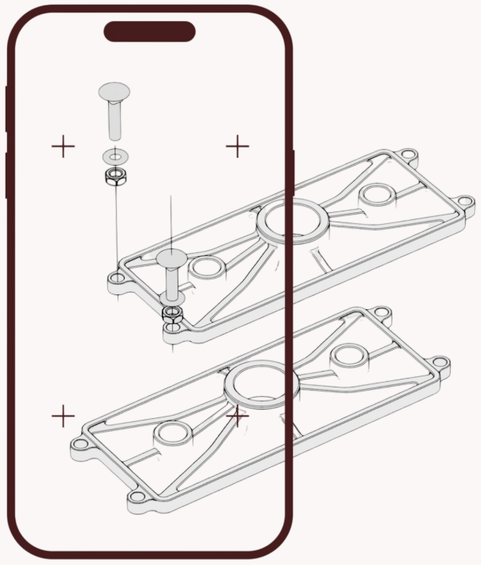




SPIRAL TECHNOLOGY

# THE SHIFT IN QUALITY ASSURANCE

## When Inspection Leaves the Bench



For most of the history of automated visual inspection, the machine has stayed put and the work has come to it. A fixed camera. A calibrated light. A fixture that holds the part at exactly the right distance and angle. It is a good arrangement when you are making a million of the same thing, because the setup cost gets spread across the run and the rig earns its keep.

A large share of real manufacturing does not look like that. Variants have multiplied, batches have shrunk, and assemblies have grown larger and more awkward to handle. Yet one step has stayed roughly where it was a decade ago: the inspection itself. Traditional systems assume the product will always come to a dedicated station. That holds for repetitive production. It falls apart on a floor where the part, the assembly, and the acceptance criteria change from one work order to the next.

*The next generation of quality assurance is mobile, intelligent, and traceable.*

At Spiral Technology we spent years building software for augmented reality headsets. The headsets themselves never took hold on the shop floor for real operational work, but along the way we learned a great deal about the problems quality leaders face with large parts and high-mix batches. So we built a system for the iPhones and iPads a team already owns, one the operator can carry: around a turbofan engine in an MRO bay, across a fairing after curing, into the body of a helicopter. No fixtures, no fixed cameras, no lighting rig, no dedicated station. The operator walks up to the work, and the work gets inspected where it stands.

## Why it became possible now

The hardware has been ready for a while. Apple shipped its first Neural Engine, a dedicated block for machine-learning inference, with the A11 chip in the iPhone 8 back in 2017. Capable silicon has been sitting idle in our pockets ever since.

What changed more recently was the vision side. By 2022 and 2023 it became practical to train custom convolutional neural networks that detect the objects you care about, quickly and accurately. Meta's Segment Anything Model, in 2024, made it just as quick to label those objects in the first place. The last piece was connecting the dots into one workflow: the operator records a short video on the floor, and within a few hours the components are labeled, a model is trained, acceptance criteria are configured, and the finished validation system is running back on the same phone.

That collapses what used to be a multi-week job for an outside contractor into something a small or mid-sized manufacturer can do in-house. It also changes what is worth inspecting at all. When the cost of pointing an inspection system at a part drops to picking up a phone, you can afford to inspect the things nobody would ever build a cell for: the forty-piece run, the one-off, the assembly buried inside an airframe that cannot be moved to a station in the first place. We built the app that does this, and called it Inventor.

## Why this matters right now

The everyday problems on a high-mix floor are familiar to anyone who has run one. What changes with Inventor is not the problems but where the inspection can go, how fast it is set up, and what it leaves behind.

| The current reality | What Inventor does about it |
|---|---|
| Variants and engineering changes arrive faster than a fixed system can be reconfigured. | A new variant is set up in minutes to hours, not weeks of vision engineering. |
| Large assemblies cannot be carried to an inspection station. | The inspection is performed on the assembly, wherever it sits. |
| Manual inspection drifts from operator to operator and shift to shift. | The same digital acceptance criteria are applied by everyone, every time. |
| Records are written by hand, if they are written at all. | Every inspection is logged automatically, with images and a timestamp. |

*Inventor does not replace inspectors. It gives them a consistent second set of eyes, available anywhere on the floor.*

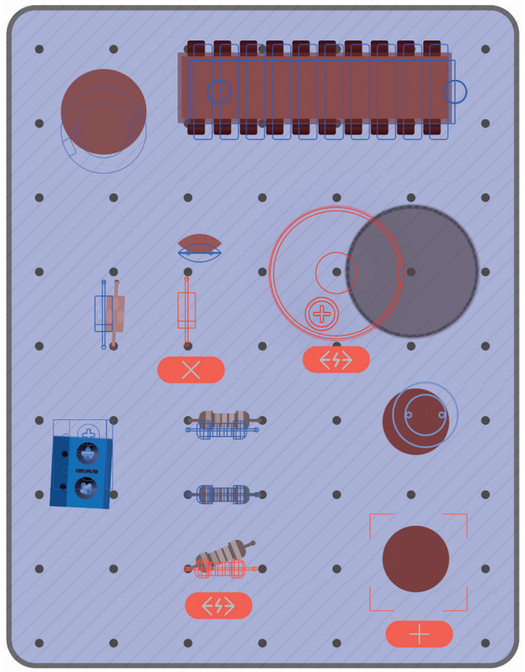
This is worth saying plainly, because it is the first question a good inspector asks. Inventor is not there to take the judgment out of the job. It makes the routine checks repeatable and the record automatic, so the person doing the work spends less of the shift on paperwork and more of it on the calls that actually need a human.

## What it actually checks

Inventor does two broad kinds of work. The first is assembly correctness: the operator captures the assembly zone by zone, and the system checks each region against what should be there, a missing component, an extra one, something misplaced or turned the wrong way, foreign object debris, and the surface defects a tired eye slides past at end of shift. The second is marking and labeling: parts are validated against the production documentation for the right serial numbers, stamps, and labels, reading engraving and ink on metal and plastic, printed text, even handwriting.

Underneath both is a cascade of purpose-trained vision models running in sequence, on the device, from part

identification through to a single logged verdict. The inference happens on the phone itself. Nothing is sent to a cloud, which for the aerospace and defense shops we work with is not a preference but a condition of entry: models are trained on the customer's own parts, at the customer's facility, and no images leave the building. It also means the tool keeps working when the floor has no signal, which floors often do not.



## The part nobody puts on the spec sheet

If mobility is the headline, the quieter and more important property is how fast the thing reconfigures. A fixed vision system treats every new part as a new project, weeks of fixturing, lighting, and tuning. On a high-mix floor that cadence is fatal, because the part has changed three times before the system is ready for the first. Inventor is meant to be stood up in the time you actually have: minutes for a new scenario on a known part, a few hours for a new part, about a day for a new family. Accuracy specs get the attention, and they matter, but the rig that takes six weeks to configure never gets deployed on a run that lasts two.

## Consistency, and the record it leaves

When the acceptance criteria live in software, every operator applies the same ones, and the veteran and the new hire reach the same decision on the same part. And because it is all digital, every inspection leaves a record without anyone stopping to write one: images, timestamp, operator, result, indexed by batch and part. When the audit comes, or a defect surfaces downstream, the trail already exists, producing the documentation ISO 9001, AS9100, and ISO 13485 require as a byproduct of the work rather than a second job on top.

## Where Inventor fits

It would be dishonest to pretend the approach is universal. Inventor is not the tool for a fully automated line at millisecond cycle times, it does not replace ultrasonic or radiographic methods that see what a camera cannot, and for sub-millimeter metrology an optical comparator or Coordinate Measuring Machine (CMM) is still correct. What it is for is the large, under-served middle:d

- High-mix, low-volume manufacturing
- Aerospace and defense assemblies
- Supplier quality acceptance
- Maintenance and MRO inspection
- Large industrial equipment
- Electronics and medical device assemblies

For a long time those inspections stayed manual by default, not because anyone thought manual was better, but because the machine could not go where the work was. That constraint is the one that just lifted. The inspection system fits in a hand now, and it turns out a great deal of quality work was only ever waiting for it to be portable.

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Startup to Watch

SPA InnoVision

# From Inspection to Intelligence

## How SPA InnoVision Is Building a Connected Digital Future for NDT

*When qualified NDT talent is scarce, every hour spent on administration is an hour not spent inspecting.*

The ASNT Foundation's 2025 Economic Impact of NDT report places the U.S. NDT workforce at roughly 89,800 professionals and finds that Level II personnel, about 55% of that workforce, face the most significant shortages. And the case for digitizing the work around inspection is well established: organizations that have moved to digital solutions have seen meaningful gains in project time, cost and overall value.*

For inspection companies, protecting scarce technical time is no longer a nicety — it is a competitive necessity.

## Putting NDT at the Centre with InspectO™

**InspectO™** is SPA InnoVision's flagship NDT Inspection Management Software. It handles conventional and advanced NDT, including UT, PT, MT, RT, VT, ET and PAUT and extends to pipeline integrity tests and surveys (UTM, ACVG, PCM and more) and to equipment and in-service inspection. Rather than treating the report as an isolated output, InspectO™ connects the complete inspection journey in one operating workflow: from Work Order and Project Planning to Resource Coordination, Field Execution, Technical Review, Approvals and Reporting in one operating workflow.

In practice, jobs are planned with the required methods, qualified personnel, equipment and consumables; technicians then execute assigned inspections through an offline-capable tablet app, capturing readings, annotating radiographs and images, and attaching supporting evidence even where connectivity is poor. Structured, workflow-based approvals route each record through the appropriate Level II or Level III review before it becomes a report, and every reading, revision and sign-off stays searchable and traceable.

Modules for procedure creation, equipment and in-service inspection, store management, project management and client access make it a single connected environment rather than a stack of disconnected tools.

*"Technology should support inspectors, not add to their administrative workload."*



### One Connected Lifecycle with InspectO™

**The same journey — planned, executed, reviewed and delivered in one workflow**

Work Order & Planning ▶ Resource Coordination ▶ Field Execution ▶ Technical Review ▶ Approvals ▶ Reporting & Client Delivery

**What InspectO™ brings to every stage**

| | | | |
|---|---|---|---|
| **Offline Tablet App**<br>Capture readings, photos & evidence where signal is poor. | **DocuMatrix AI**<br>Turns handwritten & voice input into structured data. | **Workflow Approvals**<br>Structured review sign-off with full audit trail. | **Jive AI Assistant**<br>Instant access to codes, standards & procedures. |
| **Procedure Creator**<br>Prepare & control NDT procedures by code/standard. | **Store Management**<br>Tools, consumables & site inventory in one place. | **Pipeline & Asset Integrity**<br>UTM, ACCs, surveys & in-service inspection. | **SPAVault Client Portal**<br>Live progress & approved reports for customers. |

## A Practical NDT Case: Streamlining the Work Around the Inspection

That capability is only half the story; the other half is how most inspection companies still work today. Reports may already be electronic, yet the activities before and after them stay spread across spreadsheets, email, messaging apps, paper, shared drives and separate accounting tools.

For an African NDT inspection company, the challenge was not technical capability. It was the operating model around it. The business was running roughly 6–10 active sites, handling on-call work alongside shutdown projects across locations, while coordinating permanent employees and freelancers at the same time. Inspection records moved through manual steps, site stores across multiple locations needed control, and project expenses spanning full-time staff and freelancers were difficult to consolidate.

**Management lacked a single, live view of operations.**

The management's objective was clear when they discussed with us: make the process more streamlined and efficient, without making the inspector's job harder. With **InspectO™** in place:

- Field teams captured readings, photographs and evidence on an offline-capable tablet at the point of work.
- **DocuMatrix** converted existing paper and handwritten records into structured data without wholesale re-entry.
- The **SPAVault Client Portal** gave customers controlled access to project progress and approved reports.
- The **Store Management** supported managing assets and consumables across sites, their movement, requisition as well as usage.
- The Project Management and management of timesheets and expenses helped understand and manage the financial and operational needs of the projects and sites

**The Inspection Order Lifecycle Today**

**Largely manual and scattered across disconnected tools**

Enquiry & Work Order ▶ Planning & Resourcing ▶ Field Execution ▶ Data & Evidence ▶ Review & Approval ▶ Reporting ▶ Client Delivery & Billing

Emails · Excel sheets · Paper forms · WhatsApp · Shared drives · Word / PDF · Accounting app

**The cost of a disconnected process**

- Data re-entered again and again — slow turnaround and avoidable transcription errors.
- Manual expense consolidation across permanent staff and freelancers.
- No single view of jobs, stores, personnel, expenses or project status.
- Weak traceability — evidence, approvals and reports live in separate places.

**The result:** faster report turnaround, greater consistency, and stronger operational and financial control across projects securing expected margins.

**The bigger lesson:** Digitizing the report is not the same as Digitizing the reporting process or the wider operation around it.

## Reducing Administration at the Point of Inspection

Digital transformation in NDT also has to reflect field reality. Paper forms, handwritten records and customer-specific formats will not disappear overnight, and asking technicians to manually re-enter large volumes of information into software can simply replace one administrative burden with another.

**DocuMatrix AI** is designed to bridge that gap by applying document intelligence to handwritten and paper-based inspection records and converting relevant information into structured digital data. Voice-based test capture provides another way for technicians to record information without depending entirely on manual typing. The objective is not to force inspectors to change every working practice at once.

It is to make digitization easier at the point where the work actually happens.




## Extending InspectO Beyond the Final Report

**InspectO™** also supports the activities surrounding the inspection.

The NDT Procedure Creator provides a structured environment for preparing and controlling NDT procedures based on the applicable method, code or standard. This helps bring procedure preparation, review and approval closer to the inspection workflow itself.

For **Equipment and In-Service Inspection**, InspectO™ can bring together equipment design information, NDT results, thickness measurements, checklists, supporting evidence, observations and recommendations within a single inspection record. Where relevant, condition assessments and calculations such as remaining thickness or residual life can form part of the inspection process.

**Store Management** supports the operational side of inspection by helping organizations manage equipment, tools, consumables, site stores and inventory movements required for field activities.

And where inspection progresses into understanding why equipment has failed, FailureIQ provides a structured environment for Failure Analysis and Investigation, capturing evidence, observations, investigation findings and recommendations.

These capabilities reflect a broader objective: to create a digital environment around the inspector rather than treating the inspection report as an isolated output.




## Making AI Practical for NDT

SPA InnoVision's approach to AI is deliberately practical. **DocuMatrix** reduces manual data conversion. **Jive**, an AI assistant, provides fast access to approved procedures, codes and technical knowledge in the field.

**SPA Intelligent QA**, is intended as an AI-assisted quality layer that helps technical teams flag inspection records needing additional attention before approval.

**On-the-go analytics and dashboards** are being developed to provide clearer project, operational, financial and compliance insights from their day-to-day activities.

Another area being explored is **real-time expert access during inspection**—allowing technicians in the field to connect with experienced technical specialists when additional guidance is needed.

These developments follow the same philosophy behind InspectO™:

*'Technology should strengthen technical expertise, not compete with it.'*




## Beyond InspectO™: One Connected Suite

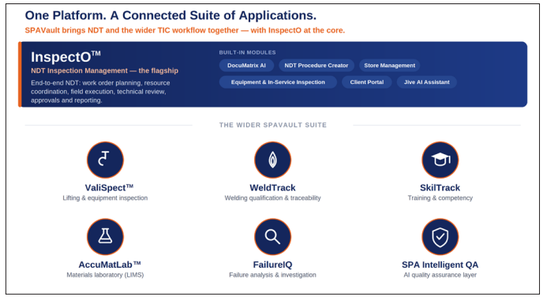
Inspection organizations often manage several related Testing, Inspection and Certification processes along with the NDT offering The broader SPAVault platform extends into these areas.

**ValiSpect™** supports lifting, OCTG and other structured, checklist-based equipment inspections and certification.

**WeldTrack** manages welding procedures (WPS), procedure qualifications (WPQR), welder qualifications (WQT) and associated traceability.

**SkilTrack** supports specialized training, workforce competency and certification validity.

**AccuMatLab™** extends the platform into chemical, mechanical and metallurgical laboratory workflows. Each application addresses a distinct operational requirement. Together, they reflect SPA InnoVision's longer-term vision of connecting people, qualifications, procedures, inspections, assets and results across the TIC lifecycle.




## Start Where the Value Is Highest

Digital transformation does not require replacing everything at once. A practical route is to begin with one high-friction workflow like a high-volume conventional NDT, a shutdown project, a multi-site customer or equipment inspection configure the required workflows and approvals, onboard the relevant field and technical teams, prove the workflow, then expand. Time-to-value begins the moment the same inspection information can move from field capture to review to customer delivery without being reconstructed along the way and also providing live management insights for successful project running and delivery.

*Give inspectors more time to inspect — and let technology take care of more of everything around them.*

## Book a Free Demo & Discovery Session

See InspectO™ mapped to your own inspection workflow. SPA InnoVision offers a complimentary discovery session to pinpoint where digitization will deliver the fastest return for your operation.

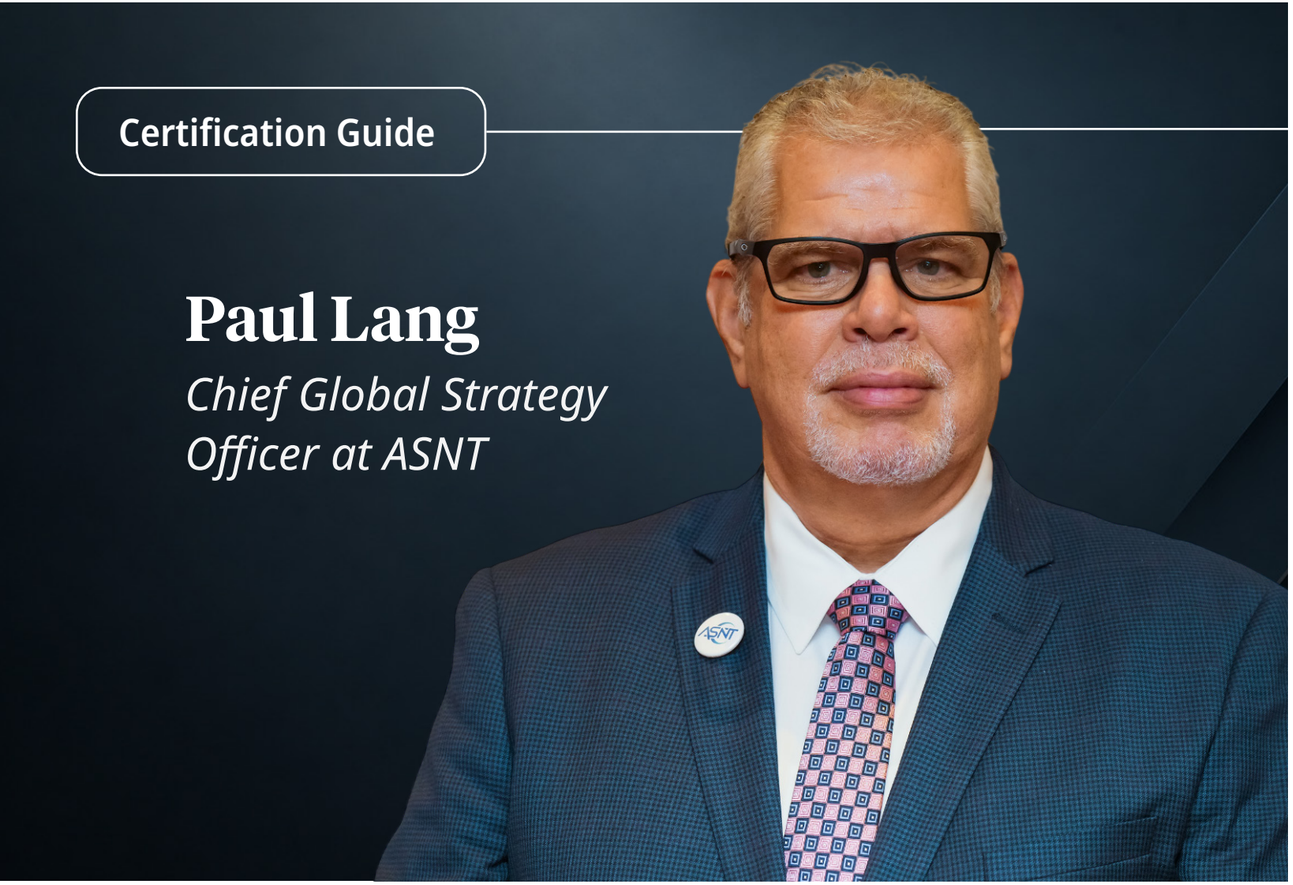
Meet at ASNT 2026 (Partner with AK NDT & Industrial Supplies LLC)

## About SPA InnoVision

SPA InnoVision develops digital solutions for the Testing, Inspection and Certification industry through its SPAVault platform, with InspectO™ at the centre of its NDT strategy. The wider platform spans equipment and checklist-based inspection, welding qualification, workforce competency, laboratory management and failure investigation.

***Data sources:** ASNT Foundation, 2025 Economic Impact of NDT Report (U.S. NDT workforce size and Level II share); Jansson et al., "Current benefits and future possibilities with digital field reporting," International Journal of Construction Management (digital field-reporting benefits). Digital-reporting figures reflect broader field-inspection research and are not InspectO performance claims.*

Know More




# Understanding ASNT 9712:

## How It Relates To ISO 9712 And What Sets It Apart

*ASNT 9712 is ASNT's third-party personnel certification program for nondestructive testing (NDT) professionals, developed from the ANSI/ASNT CP-9712 (ISO 9712:2021):2023 standard, an approved identical adoption of ISO 9712:2021, the internationally recognized standard for NDT personnel qualification and certification. It is designed to provide a rigorous, portable credential that works across employers, industries, and international borders.*

*For practitioners and employers already familiar with ISO 9712–based certification, understanding how ASNT 9712 is structured, which specific program choices it makes, and how it relates to existing certification schemes is increasingly useful, given the global nature of NDT work.*





## How ASNT 9712 came to exist

ASNT has been certifying NDT personnel for 50 years. Our first and largest third- party certification is the ASNT NDT program, launched in 1987. The ASNT Central Certification Program (ACCP) followed in 1996. When ISO 9712 was revised in 2021, ASNT took the opportunity to do something more significant than a routine update to its ACCP program: it rebuilt its third-party certification program to align directly and identically with the new edition of the ISO standard.

The path to ASNT 9712 ran through the American National Standards Institute (ANSI) consensus process, ultimately producing ANSI/ASNT CP-9712 (ISO 9712:2021):2023, an identical adoption, meaning the text of ISO 9712:2021 was adopted as written rather than adapted or modified. The ASNT 9712 certification program complies with that document, and ASNT is currently pursuing ISO/IEC 17024 accreditation through the ANSI National Accreditation Board (ANAB).

The ACCP program has been retired on a defined schedule, with the last active certifications expiring in 2029.

## ISO 9712: the foundation

ISO 9712 is the international standard for third-party certification of NDT personnel, developed by the International Organization for Standardization (ISO). The standard covers 10 NDT methods—including acoustic emission (AE), electromagnetic testing (ET), leak testing (LT), magnetic particle testing (MT), liquid penetrant testing (PT), radiographic testing (RT), strain gauge testing (SG), thermographic testing (TT), ultrasonic testing (UT), and visual testing (VT)—and establishes requirements for training, industrial experience, examinations, vision testing, and certification renewal across multiple certification levels. The ASNT 9712 certification program currently offers certification in the five most widely used NDT methods: MT, PT, RT, UT, and VT.

ISO 9712 provides a globally recognized framework that certification bodies can implement. By design, it defines core requirements while giving certification bodies latitude in certain implementation details such as how examinations are administered and scored, how practical assessments are validated, and how renewal requirements are structured. This flexibility allows the standard to function across different national contexts and industry sectors, which is why ASNT 9712 and the established international certification schemes can share the same foundational document while each makes its own program design decisions within it.

## Program design: where ASNT 9712 makes specific choices

Because ISO 9712 defines requirements rather than fully prescribing every aspect of program implementation, certification bodies have latitude in how they build the details of their programs. ASNT 9712 has made specific choices in several areas that go beyond the baseline 9712 requirements and are worth understanding.

- **Practical examination passing scores.** ISO 9712 requires candi- dates to demonstrate competence through written and practical exam- inations and sets minimum passing requirements. ASNT 9712 certifica- tion requires a minimum score of 70% on written examinations and 80% on practical examinations. The higher threshold on the practical side reflects a deliberate emphasis on hands-on performance, the direct application of NDT skills in conditions that mirror real inspection work.
- **Practical exam design:** mandatory flaws and false calls. ASNT 9712 structures its practical examinations to include mandatory flaws, meaning that certain flaws must be detected for a candidate to pass, regardless of their overall score. The program also accounts for flaw characterization, positioning, sizing, accept/reject determination, and false calls in the scoring. False calls affect a candidate's score when they incorrectly identify an acceptable indication as a defect. These design choices reflect an understanding of what competent NDT inspection requires. Detection reliability—specifically, the ability to find real defects without reporting false indications—is a meaningful measure of technician performance. Incorporating both detection and false-call assessment into the examination structure gives a better assessment of a candidate's practical capabilities.
- **Psychometric validation of practical assessments.** Statistical validation of examination content is common practice for written tests. ASNT 9712 extends this discipline to its practical examinations, using psychometric evaluation to confirm that practical assessments are objective, consistent, and produce reliable results across different candidates and testing locations. This adds a layer of quality assurance to the practical certification process, going beyond examiner judgment alone.
- **Training hours for multiple methods.** Under ASNT 9712, each NDT method for which a candidate seeks certification has its own full training hour requirements. The program does not reduce training hours for candidates who are already certified in one or more other

- methods. This is a deliberate program choice grounded in the view that each NDT method is a distinct discipline, with knowledge and skills specific to that method.
- **Recognition of employer-based training.** While ASNT 9712 maintains full training hour requirements, it does accept employer-based NDT program training certificates as qualifying documentation. Candidates who have completed structured training through their employer's in-house program can apply that training toward the certification eligibility requirements without repeating it at an external training provider. This makes the path to certification accessible to experienced practitioners with substantial employer-based training backgrounds, while maintaining the overall training standard.
- **Certification renewal.** ASNT 9712 offers two pathways for certification renewal: re-examination or a structured credit system based on documented professional development activities such as training and professional participation.

## Scope and availability

ASNT 9712 currently covers five NDT methods—UT, RT, MT, PT, and VT—at Level II and Level III. Written examinations are delivered via computer-based testing. Practical examinations are currently available in the United States, India, and the Middle East, with additional locations being developed. The method scope is expanding to include phased array UT (PAUT), which is planned for late 2026.

## International recognition and portability

ASNT 9712 was designed with international workforce mobility in mind. Because it is built on ISO 9712:2021, the same foundation used by certification bodies globally, it has a natural basis for program recognition agreements with equivalent schemes. Recognition agreements are already in place with Advanced Technical Group (ATG) in Prague and the Japanese Society for Non-Destructive Inspection (JSNDI). Additional agreements are in progress in Europe, South America, and Southeast Asia. These agreements allow candidates to access ASNT 9712 certification through recognized partner pathways and support mutual acknowledgment of certifications between programs that have confirmed compatibility. For technicians working across borders, particularly on projects with North American specifications or clients, having a certification aligned with their existing credentials and supported by formal recognition agreements simplifies the professional landscape considerably.



## The relationship with existing certification bodies

ASNT has been direct about how it views ASNT 9712 relative to established certification bodies: as complementary, not competing. The program recognition model is built around cooperation bodies that operate rigorous ISO 9712:2021–compliant programs. ASNT can work with these bodies to establish formal recognition, and candidates with equivalent certifications can access ASNT 9712 through those pathways rather than starting over.





The shared foundation in ISO 9712:2021 is what makes that cooperation possible. ASNT 9712 and the major international certification schemes are working from the same document. That common ground is the starting point for recognition, equivalence, and the kind of cross-border portability that a genuinely international NDT workforce needs.

## For practitioners and employers

ASNT 9712 offers a third-party personnel certification grounded in ISO 9712:2021, with specific program design choices around practical examination rigor, psychometric quality assurance, and workforce portability. For practitioners who work internationally or who want credentials recognized across global supply chains, it represents an additional option aligned with the international standard they are likely already familiar with.

For employers, particularly those managing projects that span multiple jurisdictions or involve North American specifications and clients, ASNT 9712 provides a certification framework that aligns with established international equivalents while reflecting a specific set of commitments regarding how competency is assessed and verified.

Understanding the details of how any certification program is built—not just which standard it references, but how that standard is implemented—is useful for anyone making decisions about certification pathways, workforce qualifications, or program recognition. For more information, visit https://certification.asnt.org/certification

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Through knowledge sharing, expert engagement, technical content, and industry collaboration, **OnestopNDT** continues to support the growth and advancement of the global NDT ecosystem.



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**Industry Expert**

**Quality Content**

**Strong Collabration**





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*A dedicated magazine featuring technical articles, interviews, case studies, industry trends, and emerging technologies shaping the NDT sector.*

### NDT Guides

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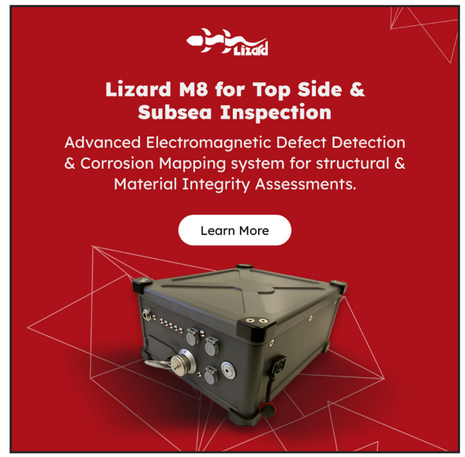

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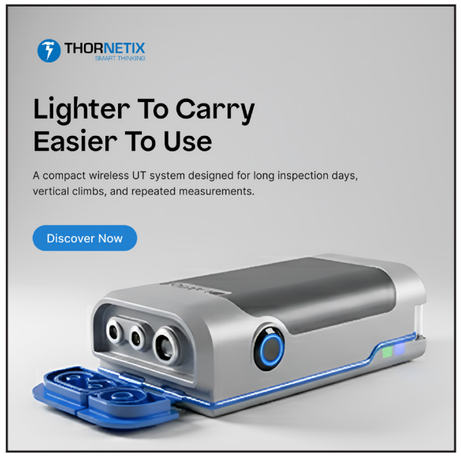




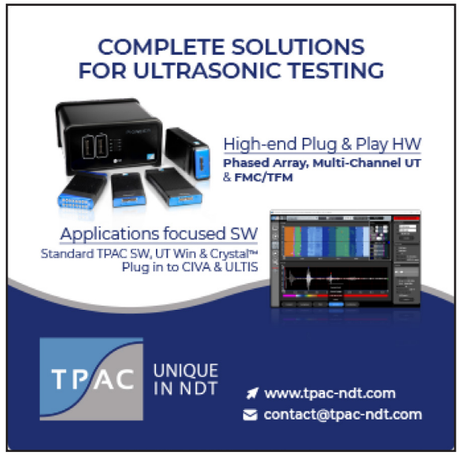



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