



**INDUSTRIAL**<sup>®</sup>  
INSPECTION & ANALYSIS



**ADVANCED  
NON-DESTRUCTIVE  
EXAMINATION SERVICES**





# KNOW YOUR EQUIPMENT INSIDE & OUT

## WITH NON-DESTRUCTIVE EVALUATIONS FROM INDUSTRIAL INSPECTION & ANALYSIS

**Whatever your industry, the safety, integrity, and reliability of parts, products, components, equipment and materials are key to your success. Defects that go undetected may lead to early replacement, costly repairs or in worst-case scenarios, dangerous conditions or failures.**

Today's non-destructive tools and technologies allow us to inspect items inside and out — without damaging the item's ability to function. From the earliest stages in manufacturing to the investigation of component failures, IIA offers a broad range of non-destructive testing solutions and unrivaled customer support.

### The NDE Experts

With roots that date back nearly a century, Industrial Inspection & Analysis (IIA) has earned a reputation as a trusted leader in testing, inspection, and certification. We are experts in both conventional and advanced non-destructive examination (NDE).

In the field and in the lab, we work with a range of devices and methodologies, including our own proprietary systems, to ensure the optimal approach for your unique needs. We bring an eye for detail to every inspection and experience that spans decades and industries.

In addition to practical experience, our professionals have in-depth knowledge of all applicable codes and standards — knowledge that helps keep you in compliance.

Our one-stop-shop services mean fast turnaround times and cost-effective solutions for our customers. When you partner with IIA, you gain access to a vast network of skilled technicians and licensed engineers, specialized inspection tools, lab facilities and quality — every single time.

# ABOUT IIA

IIA has grown to become one of North America's largest and most complete testing, inspection and certification companies. Through the assimilation of strategically located companies across the United States and Canada, IIA brings over a century of experience, best practices and leading technology to serve a multitude of industries. IIA remains committed to superb local service through our North American network of service professionals.

IIA is comprised of three main business segments: **Inspection Services, Lab Services and Engineering Services.**

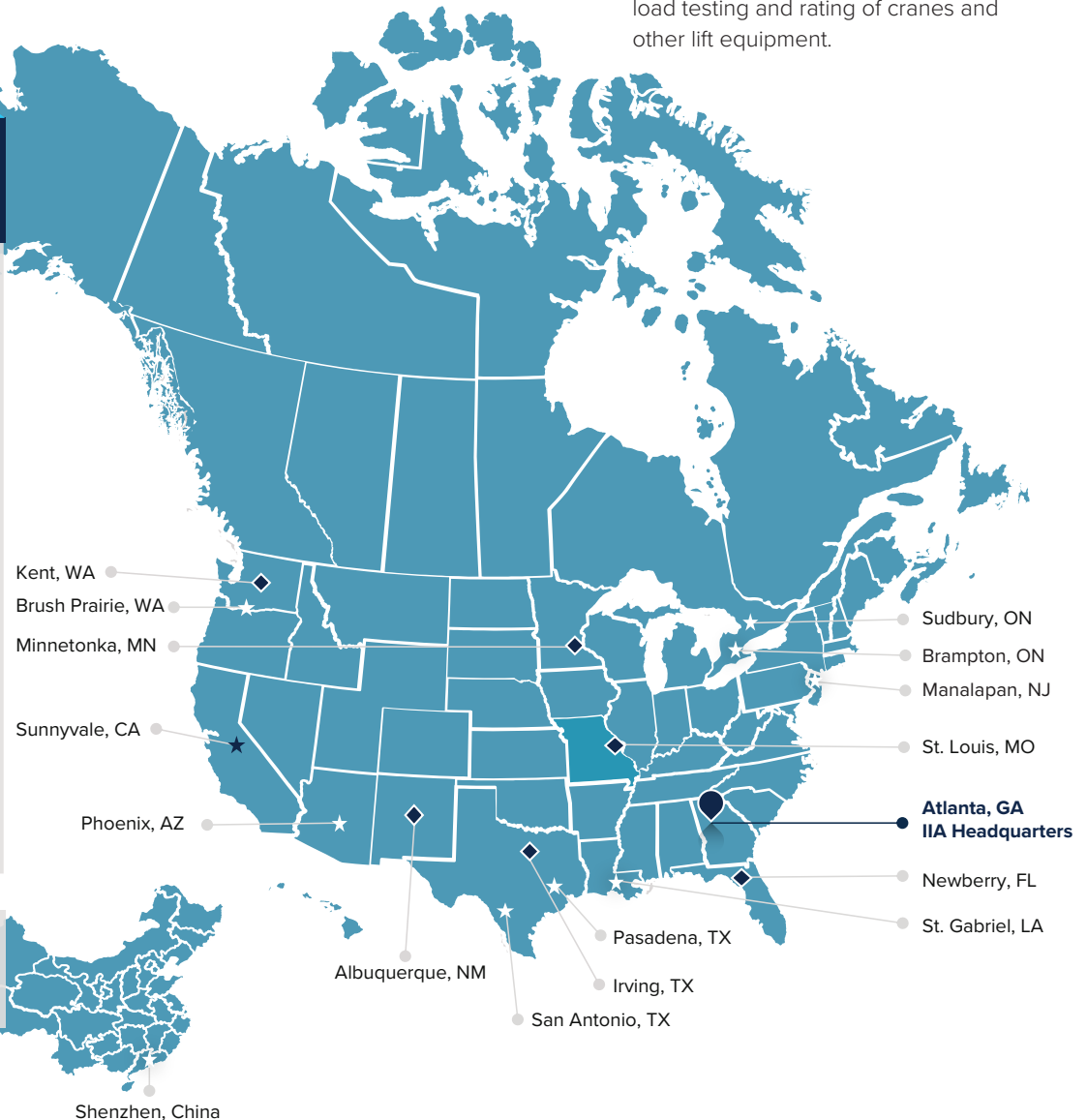
- INSPECTION SERVICES:** IIA's multiskilled technicians arrive on site with cutting-edge technology and a remote support network to support daily inspection needs, as well as planned maintenance activities. Along with our expertise in traditional /Our field service personnel are capable of performing inspections/ evaluations using traditional and specialty NDE. We also offer complete lifting solutions for overhead and mobile cranes, fire/ladder trucks, bucket trucks, deicers, and many other lift devices.
- LAB SERVICES:** IIA labs have the capacity to perform traditional lab inspection and testing scopes, such as visual testing, penetrant testing, radiographic testing, environmental testing, calibration, EMC and RF testing, as well as more complex forms of inspection, such as CT scans, CMMS, 3D modeling, and comparative analysis verification. Our lab personnel leverage a breadth of knowledge across industries to determine the best methodologies for our customer's unique testing needs.
- ENGINEERING SERVICES:** With multidisciplinary engineering expertise, our team can design, inspect, and help maintain critical steel structures, as well as perform compliance and safety inspections, welding engineering, forensic engineering, incident investigations and equipment validation. Our engineering experts can also develop repair procedures for damaged cranes and other construction equipment, engineer lifts for heavy loads, tandem crane lifts or installation into difficult areas and provide load testing and rating of cranes and other lift equipment.

## INDUSTRIES WE SERVE

These are just some of the industries that trust IIA for their inspection needs.

- Aerospace & Aviation
- Bridge & Infrastructure
- Government and Defense
- Fire Departments
- Medical
- Midstream Oil & Gas
- Petrochemical & Refinery
- Power Generation
- Precision Manufacturing
- Pulp & Paper
- Radiofrequency Devices

- ★ Field Office
- ★ Laboratory
- ◆ Field Office & Laboratory



# OUR INSPECTION APPROACH

## PHASE 1: Pre-Project Planning

- Gain an understanding of the client's needs and expectations related to inspection intervals, identifying imminent problems, planning repairs and communicating internally.
- Identify inspection locations and technologies that will best meet client needs.
- Using isometric drawings, lay out the inspection plan, including methodology and tools to maximize the probability of flaw detection (POD).

## PHASE 2: Site Walkdown & Discussions

- Perform a walkdown of components using Phase 1 information.
- Identify any hazards, delays or obstructions that could hinder the timeliness and quality of the inspection.

## PHASE 3: Conduct Inspections

- Perform thorough inspections using the technologies discussed in Phase 1.
- Generate on-site reports ("inspection of record"), exporting and formatting data as needed for ease of reporting.
- Promptly report any areas that are in violation of the client's acceptance criteria.

## PHASE 4: Final Report

- Deliver an actionable inspection report that allows the client to make well-informed decisions about their assets to support safe and reliable operations.

# CONVENTIONAL NDE SERVICES

## DYE PENETRANT (PT)

This widely applied and low-cost inspection method is used to locate surface-breaking defects in all non-porous materials, such as metals, plastics, or ceramics. PT is used to detect casting, forging and welding surface defects such as hairline cracks, surface porosity, leaks in new products, and fatigue cracks on in-service components. IIA is capable of performing all types and methods of penetrant inspection.

## MAGNETIC PARTICLE (MT)

Magnetic particle inspection (MT or MPI) is an inspection method for locating surface or shallow sub-surface defects on ferromagnetic material, such as castings, forgings, welds and machined parts. IIA can perform both wet and dry MPI methods. There is essentially no limit to the size and shape of parts that can be inspected using MT.

## RADIOGRAPHY (RT)

For welds, castings and parts used in high stress or high reliability environments, radiographic testing is a highly accurate method to detect internal defects not apparent on the surface of the part. Conventional radiography using gamma sources is a popular method of non-destructive testing in numerous industries due to its proven accuracy, cost effectiveness, high level of portability, and extreme flexibility. We perform x-ray/gamma ray/radar inspection – both film and digital – to MIL-SPEC, ANSI, ASTM and ASME specifications. This is often performed in conjunction with penetrant or magnetic particle inspection for surface coverage. IIA can inspect practical thickness ranges up to 3.0" steel.

## ULTRASONICS (UT)

Ultrasonic testing is a suite of methodologies that detect a variety of indications or characterize materials by transmitting high-frequency sound waves through a test item into a receiver. Depending on how the sound waves travel through the object, determinations can be made about the material condition and structural integrity of the object. One common use is ultrasonic thickness testing (UTT), which measures the thickness of the test object to determine the extent of corrosion. IIA performs both contact and immersive UT, with capabilities for pulse echo, transmissional, straight beam, angle beam (shear wave) testing, as well as advanced phased array techniques.

## VISUAL TESTING (VT)

With an eye for detail, our highly trained and certified inspectors will visually inspect for indications such as cracks, corrosion, erosion, damage, and overall structural integrity of equipment such as tanks, steam turbines, fans, pressure vessels, piping, lift equipment and more.

“Working with IIA just makes sense...they have fantastic technical knowledge and skills.”

~ Stephanie Gehrke, Commercial Plastic



# ADVANCED NDE SERVICES

## **AUTOMATED CORROSION MAPPING (INTERNAL)**

This advanced ultrasonic technique uses an automatic scanner to assess the thickness of pipelines, pressure vessels and other critical equipment. The technology allows us to precisely map out and measure internal areas of corrosion.

## **AUTOMATED CORROSION MAPPING LASER PROFILOMETRY (EXTERNAL)**

For areas that cannot be accessed for manual examination, laser profilometry can be used to scan the surface of an object and quantify exterior roughness or cracks. This approach collects more data points and provides multiple views for analysis that can be helpful in determining if an indication is corrosion or a manufacturing defect. This inspection technique can increase the probability of detection and reduce inspection times from hours to minutes.

## **COMPUTED RADIOGRAPHY (CR)**

IIA uses the smallest, lightest CR system designed specifically for non-destructive testing. Using direct input from mobile X-ray technicians, CR greatly increases the speed and efficiency of testing, while maintaining high levels of image quality and sensitivity. Images are processed in seconds, expediting weld approval and clearance. Images may be exported for immediate auditing or imported into CAD drawings for package detailing.

## **FULL MATRIX CAPTURE (FMC)**

This portable phased array ultrasonic testing technique provides more complete and reliable data by capturing every possible transmit-receive combination for a given transducer. FMC can improve inspection speed and accuracy and minimize the need for re-scans.

## **GUIDED WAVE TESTING (GWT)**

Using rapid remote ultrasonic screening, guided wave testing identifies changes in a component's cross section that could result in external and/or internal defects. This corrosion detection method is ideal for screening significant lengths of metallic pipelines or other hard-to-access areas in a pipeline system. Unlike conventional ultrasonic systems, GWT is capable of assessing areas several hundred feet away from the transducer.

## **PHASED ARRAY UT (PAUT)**

This advanced method of ultrasonic testing is used to determine component quality and detect flaws in manufactured materials, such as welds. In addition, PAUT can be effectively used for wall thickness measurements in conjunction with corrosion testing. This NDE technique can be deployed manually or automated, and it is minimally invasive, highly flexible, and offers multiple applications.

## **PULSED EDDY CURRENT ARRAY (PECA)**

Pulsed eddy current array is a highly accurate technique to determine average wall thickness for any material that conducts electricity. PECA is best used as a screening technique; other methods are better suited for detecting isolated areas of corrosion.

## **CONVENTIONAL UT (SHEAR WAVE)**

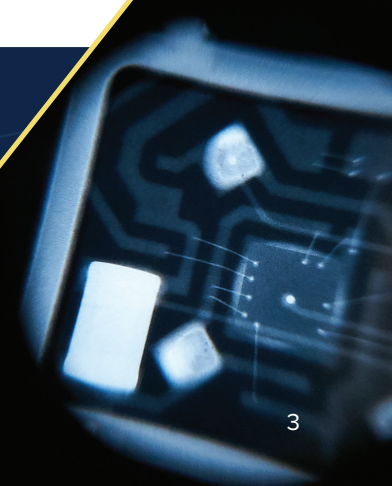
Primarily used for weld inspections, shear wave testing uses a probe to direct ultrasonic beams toward the weld at an angle. This advanced testing technique is often required for inspections involving awkward weld geometry or where a weld crown or bead is present.

## **TIME OF FLIGHT DIFFRACTION (TOFD)**

This advanced technique is a sensitive and accurate nondestructive method used primarily to identify weld defects with extreme angles. TOFD is also effective in improving sizing accuracy of weld defects and detecting discontinuities such as cracks, lack of fusion and lack of penetration.

“IIA’s NDT technicians are the best in the industry. Nobody in this industry compares to the top-notch team I’ve worked with from IIA.”

~ Chris Meeker, Union Tank Car Company



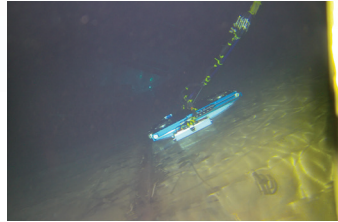
# PROPRIETARY TECHNOLOGY

We are experts in the most advanced examination techniques available today. And we are always working to develop the preferred techniques of tomorrow. From ARMUT®'s high-resolution elbow weld images to the AIRIS® RPV robotic scanner, IIA has developed patented technologies that allow us to meet any inspection challenge with confidence.



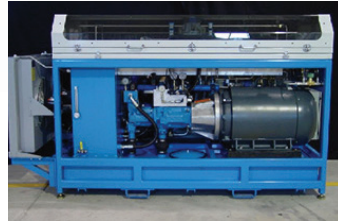
## ARMUT®

Our patented ARMUT® system is used to inspect piping welds and complex geometry and provides the highest data quality regarding elbow welds.



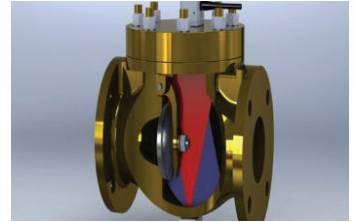
## AIRIS®

IIA's AIRIS® is designed with QR Code scanning technology to thoroughly and accurately inspect components inside tanks and vessels.



## NITROJET®

The portable Nitrojet® high-pressure cleaning system quickly and easily removes contamination, regardless of its location.



## PASS®

PASS® offers more reliable data regarding valve operability and predictive maintenance — without disassembly.



“IIA’s team was professional, courteous, and patient, and they provided honest feedback; they delivered more than I expected, and the final report was excellent.”

~ Stephen M. Clark, Exelon Corporation

## IIA: YOUR ONE-STOP SHOP

As a full-service inspection company, here's what you can expect from IIA:

- An unwavering commitment to safety
- Responsive customer service
- Fast turnaround times
- Highly skilled technicians
- Multidisciplinary engineering expertise
- World-class laboratory services
- State-of-the-art tools & technologies
- Respect for schedule, budget and compliance restraints
- Lower Total Cost of Ownership

## NDE Training

IIA is committed to sharing our expertise by training our customers on the latest NDE tools and techniques. Our Technical Training will build in-house knowledge of NDE and improve your ability to communicate your company's NDE needs to NDE experts.

It's a great way to invest in your team and your company's success.

## RVI

Remote visual inspection (RVI) reveals internal risk factors that might otherwise escape detection, and RVI is one of our specialties at IIA. We're one of few companies whose RVI cameras include explosion-proof models that can navigate tanks, tubes, vessels and pipes with ease.

RVI offers an affordable alternative to disassembly and allows our experts to gather critical information in hazardous environments — without risking worker safety. From access points as small as one-quarter inch in diameter, we can provide internal visual inspections of tanks, tubes, vessels or pipes, as well as foreign object removal.



# BEYOND NDE...

In addition to our expertise in non-destructive evaluation, IIA offers destructive testing that involves applying load on the test item to quantify the mechanical properties of a material. Our destructive testing capabilities include:

- TENSILE & IMPACT TESTING
- HARDNESS TESTING
- PRESSURE TESTING
- FASTENER TESTING
- ABRASION TESTING

## SKILL, SPEED & SERVICE

The team at IIA combines unmatched technical expertise with exceptional customer service to provide the solutions you need to be successful. Everything we do is designed to help customers enhance safety, minimize defects and downtime, and manage total cost of ownership.

“That first inspection made it clear that IIA had the expertise we needed, so we had them come out and do the rest of our fleet.”

~ John Friley, Westerville Electric Division





*Making the World Safer*

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