

NTIAC's capabilities cover the full spectrum of Nondestructive Evaluation (NDE) including the following applications:

- Aging Systems
- Condition Based Maintenance
- Corrosion Detection
- Equipment Readiness
- Fatigue Assessment
- Flaw Sizing/Metals, Ceramics, Composites
- Life Assessment/Prediction
- Manufacturing Quality Improvement
- On-board Health Monitoring
- On-line Sensors for Process Control
- Product & Process Design
- Residual Stress

And the following technologies:

- Acoustic Emission
- Eddy Currents
- Electromagnetic/Microwave
- Infrared/Thermal
- Magnetic Particle
- Optical/Holography
- Penetrants
- Probability of Detection (POD)
- Radiography
- Ultrasonics

NTIAC provides technical expertise, authoritative analysis, engineering services, and laboratory support in responding to DoD, other Government agency, and industry requests and needs in areas related to Nondestructive Evaluation (NDE). Present day advanced technology requires materials, components, and structures of unprecedented efficiency, operating nearly at their ultimate capability; at the same time, approaches are being sought to cut costs by extending the life of many aging structures and operating systems. As a result, there are increasing requirements for capabilities to test, inspect, and evaluate nondestructively to ensure quality, reliability and safety.

NTIAC specializes in all aspects of nondestructive evaluation, inspection, and testing in the broadest possible sense. NTIAC applies NDE technology to meet DoD, other government agency, and industry needs: in designing new advanced materials and processes, for on-line process control during the manufacture of advanced materials and systems, for in-service inspection to increase life expectancy, and to provide a basis for condition based maintenance decisions.

TATs & Products

Nondestructive Inspection of Submarine Towed Arrays

The Navy uses towed arrays as critical elements in data gathering for submarine combat systems. NTIAC is evaluating NDE approaches to inspect towed array components which are candidates for potential failure during deployment or service at sea. NDE methods developed by NTIAC for towed array components will prevent catastrophic failure, assure reliable service of these components, and provide for more quantitative retirement decisions leading to saving the Navy money.

Nondestructive Detection of Corrosion on Shipboard Piping

NTIAC provided an advanced technology demonstration of ultra-sonic guided wave inspection technology on insulated piping aboard the USS Stump. This technology will be used by the Navy to determine the integrity of bleed air piping systems by detecting defects such as pitting and generalized wall thinning. Information obtained as a result of NTIAC's efforts will be used by the Navy to direct monitoring of piping systems during sea operations thereby helping to ensure fleet readiness.

Tactical Data for Special Operation Forces

Because requisite logistic support may not always be available for strategic or special reconnaissance in theatre, Special Operations Forces and



Nondestructive Testing Information Analysis Center

Light Infantry need methods to gather and analyze information in adverse environments. NTIAC determined which aspects of special reconnaissance missions and tactical situations lent themselves to NDE information collection and analysis techniques and identified a variety of NDE methodologies that could aid in gathering information for mission requirements.

NDE of Aging Systems

Under Air Force sponsorship, NTIAC has collected, organized and assessed research and engineering information on NDE of aging aerospace systems. Specific areas reviewed include detection of hidden corrosion and cracks in aircraft, and applications of digital radiography to aerospace systems. NTIAC identified overlapping areas of work as well as technology gaps where additional effort is needed. The information provided by NTIAC will help the Air Force develop plans to increase service life of aircraft and to reduce maintenance costs of aging aircraft through applying cost saving condition based maintenance.

Nondestructive Inspection of High Pressure Gas Cylinders

The U.S. Department of Transportation, Research and Special Programs Administration, has the responsibility of assuring the safe operation of high pressure gas cylinders during transportation. Under DOT sponsorship, NTIAC is evaluating NDE data from aluminum high

pressure gas cylinders for the detection of sustained load cracking (SLC). This cracking, which occurs in the neck and shoulder region of the cylinders often results in leaks and occasionally a rupture.

Nondestructive Evaluation (NDE) Capabilities Data Book

This Data Book consolidates and organizes available reference data for demonstrated NDE performance capabilities into a single source. The Data Book contains over 400 Probability of Detection (POD) curves dealing with a large variety of nondestructive evaluation applications, such as cracks in compressor disk bolt holes and cracks in aircraft aluminum lap splice joints. The Data Book is an excellent source of information for selecting options for use of NDE to assure fracture critical structural integrity design requirements and in life cycle maintenance operations.

State-of-the-Art Reports:

- Neutron Radiography
- Heat Damage in Composites
- NDE of Hidden Corrosion
- NDE of Cracks in Aircraft
- NDE of Residual Stress in Metals

Technology Assessments:

- Laser Ultrasonics
- NDE for Process Control of Polymer Matrix Composites
- Micro-ElectroMechanical Systems (MEMS) for NDE of Navy Aircraft
- Magnetic Particle Inspection
- Digital Radiography
- Advanced X-Ray NDE Techniques

For a listing of products, prices, and availability, contact NTIAC or visit our Web site at <http://iac.dtic.mil/ntiac>

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