

# NDT FOR TECHNICAL AND QUALITY OVERSIGHT PROFESSIONALS

## *Improving Product Reliability Training Module*

Discontinuities that arise during the manufacturing process can have an adverse impact on product performance and reliability. Nondestructive testing (NDT) methods assist in the discovery and evaluation of many types of discontinuities on or hidden beneath the surface of materials. Surveillance of critical NDT activities requires knowledgeable oversight staff... so are you ready?

### PROTECT YOUR INVESTMENT

Reliability of structures, systems, and components depends on factors such as design, materials, manufacturing, installation, and operation. For items that really matter, NDT methods are often employed to provide assurance that many types of material and manufacturing discontinuities are discovered and evaluated with respect to acceptable limits. Diligence is required on all fronts, including the use of experienced oversight staff during the manufacturing/construction stage to assess NDT inspections and activities.

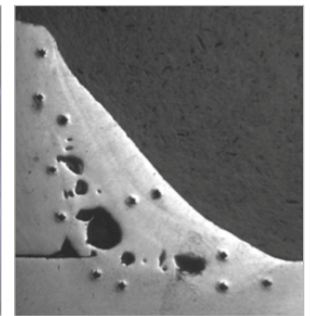
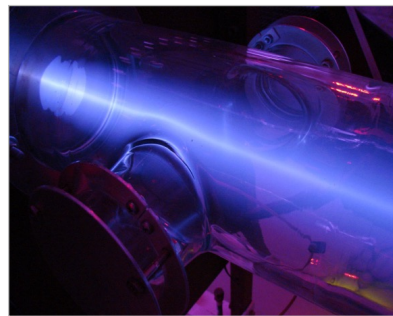
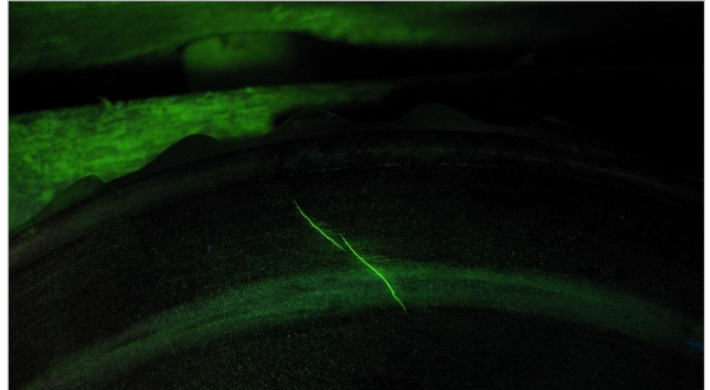
### IMPROVE THE EFFECTIVENESS OF YOUR OVERSIGHT STAFF

NDT methods can be complex, requiring trained and certified individuals to perform these tests, inspections, and evaluations. But what about staff that performs the oversight of these activities? Do they have the necessary skills and knowledge to adequately assess these activities?

With NAC's training, you can better position oversight staff to identify strengths and weaknesses in the many complex NDT methods and inspections encountered during technical and quality surveillance of these activities.

### WHO CAN BENEFIT FROM THE TRAINING?

Engineers, technical personnel, and QA oversight staff at the manager or individual contributor level that are involved with design, manufacturing, construction, receiving-inspection, handling, performance and reliability of products



and equipment will benefit from this training. The training is applicable to individuals at all levels of experience, from new hires to your most seasoned professional.

### WHAT DOES THE TRAINING COVER?

The four-day training seminar begins with a review of various types of discontinuities and their associated origins and causes. We will depict and discuss typical discontinuities (or flaws) that can exist in ingots, castings, plates, bars, forgings, or from welding, processing, or service. We will also cover requirements for certification of personnel performing NDT (e.g., Level I, Level II, and Level III per the American Society for Nondestructive Testing SNT-TC-1A).

*Continued*

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Following these introductory topics, our Level III trainers and other NAC staff will lead detailed sessions covering the principles, limitations, equipment, techniques, applications, and interpretation of results for each of the following major NDT methods: Visual Testing (VT), Liquid Penetrant Testing (PT), Magnetic Particle Testing (MT), Ultrasonic Testing (UT), Radiographic Testing (RT), Eddy Current Testing (ECT), Helium Mass Spectrometry Leak Testing (He-MSLT), and Active/Passive Gamma Scanning (GS). The last two methods include discussions regarding applicability to the manufacture of nuclear fuel rods.

Due to the broad range of methods covered, the training hours are not sufficient for achieving Level I certification, but portions of the content can be credited toward certification in one or more methods if follow-on training is pursued with our affiliate Level III instructors from Applied Technical Services (ATS).

## COURSE CONTENTS

### DAY 1

- NDT Introduction
- Discontinuities and Origins
- Destructive and Nondestructive
- Testing
- Personal Certification for NDT
- VT – Visual Testing
- Vision requirements for VT
- Oversight for welding and welds
- Other observations and inspections (corrosion, nuclear fuel)
- PT – Liquid Penetrant Testing
- Principals and limitations
- Penetrant and developer application/removal
- Interpretation of test results

### DAY 2

- MT – Magnetic Particle Testing
- MT principles and limitations
- Equipment and inspection methods
- Relevant and nonrelevant indications
- UT – Ultrasonic Testing
- UT principles and limitations
- Equipment and inspection techniques

- Data displays and interpretation of test results
- Calibration and standards

### DAY 3

- RT – Radiographic Testing
- Film Radiography
- Computed Radiography (CR)
- Techniques and applications
- Interpretation of test results
- ET – Eddy Current Testing
- ET principles and equipment
- Techniques and applications
- Interpretation of test results

### DAY 4

- ET – Eddy Current Testing (continued)
- LT – Helium Leak Testing
- HLT principles and equipment
- Techniques and applications
- Interpretation of test results
- GS – Active and Passive Gamma Scan
- Active/Passive GS principles and equipment
- Techniques and applications
- Interpretation of test results

## ABOUT THE INSTRUCTORS

*NAC and ATS have joined forces to provide industry oversight personnel with a comprehensive learning experience on NDT methods.*

### **JOHN RIVERA** *(NAC International)*

#### **Director of Nuclear Fuel Performance**

*An MIT graduate with advanced degrees in Nuclear Engineering and Materials, and over 35 years of experience providing technical and quality services to the nuclear utility industry in the areas of nuclear fuel procurement, contracts, fuel and core component design, materials, performance, and technical/quality manufacturing oversight. Qualified NQA-1 Lead Auditor and Six Sigma Green Belt certified.*

### **ED GOSSELIN** *(Applied Technical Services)* **NDT Level III**

*A highly accomplished NDT Level III and award-winning instructor with over 26 years of experience in NDT, certified by ASNT in multiple methods including PT, MT, ET, UT, and RT. Effective and impassioned X-ray Radiation Safety Officer with a keen appreciation for safe and efficient operations. Esteemed QA manager, focused on process and product improvement, safety, and efficiency.*

### **JIM MACMILLAN** *(Applied Technical Services)* **NDT Level III**

*Over 27 years of NDT experience in all major methods. United States industry certification with ASNT Level III; certified for 24 years. Currently certified in seven NDT methods. Highly experienced instructor and auditor in all major NDT methods, and contributor to industry specifications for NDT methods and quality procedures.*

For additional information, please contact John Rivera at [jrivera@nacintl.com](mailto:jrivera@nacintl.com) or call 770-595-4929.

***Examinations and course completion certificates provided at customer request.***