



**ANNUAL SALARY: \$54,000 - \$93,000\* | NOC: 2261 | Skilled Trade (Not Designated in Nova Scotia)**

*\*Based on a 40-hour work week at current collective agreement rates for journeypersons. Does not include benefits.*

## WHAT WE DO

NDTers (non-destructive testers) use sophisticated scientific methods to assess the integrity and properties of a material without damaging it.<sup>1</sup> They use techniques such as:

- **Eddy current testing (ET)**, which identifies materials and measures material thickness through electromagnetic induction, where alternating currents are applied to a conductor like copper wire to make a magnetic field. Based on disruptions in this, NDTers are able to tell how much heat damage, wear or corrosion, and erosion a material has which may not be visible on the surface. A variation on this is called pulsed eddy current testing, where inspections can be performed even through weather treatment and insulation. National Resources Canada (NRCan)<sup>2</sup> certifies individuals in this and other methods of testing.
- **Liquid penetrant testing (PT)**, which, combined with **visual inspection**, lets you identify small imperfections as a dye is applied to a material to highlight defects and reveal discontinuities in the material that you would not be able to see with your naked eye.
- **Magnetic particle testing (MT)**, which works off the principles of magnetism to show damage on a material. NDTers use iron particles that are attracted to magnetic fields to show visible signs of wear and tear in materials under investigation. A variation on the work is to use brightly lit fluorescent particles under black light conditions instead of using normal daylight.
- **Radiographic testing (RT)**, which is commonly performed by exposing a material to controlled amounts of what is usually gamma ray or x-ray radiation. Techniques include digital radiography (computed radiography, real-time radiography, direct radiographic imaging, and computed tomography) and film radiography. NDTers working in this area must have EDO (exposure device operator) certification (available through the Canadian Nuclear Safety Commission<sup>3</sup>). (Operator of Portable X-Ray Fluorescence Analyzers - XRF - certification is also available from NRCan.)
- **Ultrasonic testing (UT)**, which uses high frequency sound energy to detect and provide information about a material under investigation. This area of non-destructive testing is divided into pulse-echo and through transmission, normal beam and angle beam, and contact and immersion techniques, which can be used to determine an object's thickness or defects.<sup>4</sup>

Persons working in this field typically have **math and science abilities**, are **organized, able to create and interpret drawings and tables, analyze data, problem solve**, and **use computer testing systems**. **Hand-eye coordination, climbing, working in uncomfortable positions, continuous learning**, and **heavy lifting** are all part of the daily work of NDTers.

Entry into this field can be done through applying to be a trainee (assistant) for qualified NDTers. Vocational training can also be obtained through providers such as the Canadian Institute for Nondestructive Evaluation<sup>5</sup>, College of the North Atlantic<sup>6</sup>, Quality Control Council of Canada (QCC)<sup>7</sup>, Canadian Welding Bureau (CWB) Group (NDT courses)<sup>8</sup>, and other accepted training organizations on the NRCan website.<sup>9</sup>

Students should note that a high school diploma or equivalent is a requirement for many postsecondary programs. Employers may also want you to obtain CWB Welding Inspector certification or Boiler and Pressure Vessel Inspector, Process Pipeline Inspector, or Aboveground Storage Tank Inspector Certification from the American Petroleum Institute.<sup>10</sup>

<sup>1</sup> <http://www5.hrsdc.gc.ca/noc>

<sup>2</sup> <http://www.nrcan.gc.ca>

<sup>3</sup> <http://nuclearsafety.gc.ca>

<sup>4</sup> From technicians at Boomer Technical Resources in the province of NS (<http://www.boomertechresources.ca>) and QCC

<sup>5</sup> <http://www.cinde.ca>

<sup>6</sup> <http://www.cna.nl.ca>

<sup>7</sup> <http://www.qcccanada.com>

<sup>8</sup> <http://eng.cwbgroup.org>

<sup>9</sup> <http://www.nrcan.gc.ca/mining-materials/non-destructive-testing/training-test/8628>

<sup>10</sup> <http://www.api.org>

ET = Eddy Current Testing  
 PT = Liquid Penetrant Testing  
 MT = Magnetic Particle Testing  
 RT = Radiographic Testing  
 UT = Ultrasonic Testing

# NON-DESTRUCTIVE TESTING CAREER PATHWAY

## Engineering, Materials and Components (EMC) Sector

**\$14.09 –  
\$38.00 / hr\***

**Grade Twelve Diploma or Equivalent**

**Trade School or College-Level Program:**  
 Complete a college or trade school program to obtain vocational training  
 (work terms with qualifying experience).

**Direct Entry:**  
 Obtain employment on own or contact a union for indenturing.

ET Trainee      PT Trainee      MT Trainee      RT Trainee (EDO)\*\*      UT Trainee

**Materials & processes exam, vision testing & math skills test requirements for training & initial NDTer certifications\*\*\***

3 mos. work experience, 40 hrs. of coursework & exam****	1 mo. work experience, 16 hrs. of coursework (no exam)	1 mo. work experience, 16 hrs. of coursework (no exam)	3 mos. work experience, 40 hrs. of coursework & exam	3 mos. work experience, 40 hrs. of coursework & exam
ET Level 1	PT Level 1	MT Level 1	RT Level 1	UT Level 1
12 mos. work experience, 104 hrs. of coursework & exam	4 mos. work experience, 40 hrs. of coursework & exam	4 mos. work experience, 40 hrs. of coursework & exam	12 mos. work experience, 120 hrs. of coursework & exam	12 mos. work experience, 120 hrs. of coursework & exam
ET Level 2	PT Level 2	MT Level 2	RT Level 2	UT Level 2
30 mos. work experience, 150 hrs. of coursework & exam	16 mos. work experience, 60 hrs. of coursework & exam	16 mos. work experience, 60 hrs. of coursework & exam	30 mos. work experience, 160 hrs. of coursework & exam	30 mos. work experience, 160 hrs. of coursework & exam
ET Level 3	PT Level 3	MT Level 3	RT Level 3	UT Level 3

CWB Welding Inspector Levels 1, 2 & 3      API Boiler & Pressure Vessel / Process Pipeline / Aboveground Storage Tank Inspector Certification      XRF Operator Certification Levels 1 & 2

\* Average hourly pay for trainees to technicians under the Quality Control Agreement from the QCC of Canada, involved unions, Construction Labour Relations Associations of Newfoundland and Labrador and NS, NDT Management Association, and non-destructive testing companies on mainland NS as of 2014. Levels of certification and additional qualifications (e.g., CWB Welding Inspector, EDO, etc.) may create wage rate adjustments under collective bargaining units.

\*\* EDO certification should be obtained prior to becoming a trainee in radiographic testing. It involves a separate process further detailed on the NRCan website.

\*\*\* First-time applicants must pass a math skills test, then a materials and processes exam (training not needed if sufficient evidence of prior coursework is obtained with a passing exam grade) and vision assessment. Requirements may change with the method of NDT. (From NRCan)

\*\*\*\* Work experience in months is based on a standard 40-hour workweek, 175 working hours a month, or what is considered a legal week of work. Excess hours or practical workshop time may be credited if evidence is supplied. Exams may be taken before or after gaining the work experience and remain valid for five years. Coursework must be obtained prior to application for an exam from providers that are pre-approved by the national certification body. Examinations are both written and practical. Persons applying for NDT and related certifications should also note that fees are required to be paid at each level. (From NRCan)