TRAINING PROGRAM ON

NDT - Introduction

ABOUT ARRELIC TRAINING INSTITUTE

Arrelic Institute is focused to equip both industry professionals and college graduates with the skills and knowledge required for bridging the desire stare of workforce which industry needs to compete globally.

Arrelic Institute provides over 75 different type of customized training programs in the field of Reliability Engineering, Asset Management, Best Practice, Operation & Maintenance, Predictive Maintenance, NDT, Predictive Analytics, Quality, Risk & Safety.

Arrelic Institute conducts public trainings and workshops in 38 locations across India and 10+ International locations. We are working for large corporate house from 15 different types of industries ranging from Airlines, Automobiles, Cement, Defence Manufacturing, FMCG, Glass, Marine, Metals, Mining, Oil & Gas, Power, Pulp & Paper, Facility Management and Fertilizer.

ARRELIC INSTITUTE: AT A GLANCE

- **50+** E-Learning Training Modules
- **75** Training Modules
- **06** Industry Specific Domain
- **15** Global Locations
- **15** Types of Industries
- **02** University Program
- **40+** Global Experts
- **38** locations in India
- **5+** Associations

www.arrelic.com/offerings/training-and-development

ARRELIC AWARDS & RECOGNITIONS

NASSCOM®

TOP5

Won the Top 5 Startups in eastern India in Thieve 30 by NASSCOM

GLOBAL ENTREPRENEURSHIP SUMMIT INDIA 2017

Selected for GES – 2017, Hyderabad and showcased among top 100 Start-ups from India.

SMART FIFTY
50 Solutions to Transform India

TOP50

Emerged as one of the top 40 startups in #Smartfifty' – a search for solutions to transform India

PULSE THE VENTURE INSPIRING INNOVATION

Top 24 Start-ups selected over 1850 startups across India By CNBC.

NASSCOM® PRODUCT CONCLAVE

Selected for NPC – Bangalore and NPC – Kolkata for Product showcase.

TiE CON DELHI-NCR

Product showcased in TIECON – 2017 and selected through Govt. Of Odisha.

#startupindia

Startup India Recognize

Startup Odisha

STARTUP ODISHA recognised.

birac
Ignite Innovate Incubate

BIRAC finalist in SPARCH - 2017

web summit
LISBON, NOVEMBER 6-9, 2017

Selected for Web summit - Lisbon

hello tomorrow

Selected for Hello tomorrow, Paris Summit.

100 open startups

Selected and presented in 1000 open startups.

ABOUT THE TRAINING COURSE

NDT-Introduction

Arrelic's training program on NDT-Introduction focuses on the importance of NDT. Non-destructive testing is the use of physical methods which will test materials, components and assemblies for flaws in their structure without damaging their future usefulness. The course includes an introduction to NDT history, certification, advantages and limitations of the main methods including visual testing, penetrant testing, magnetic particle testing, radiographic testing, ultrasonic testing, NDT reliability and the future. NDT is concerned with revealing flaws in the structure of a product. It, however, cannot predict where flaws will develop due to the design itself. While there are more than 32 different NDT methods (basic theoretical principal) and even more techniques (the way in which method is applied) only six major methods are primarily used:

Surface and subsurface indications are usually sought by using

- Penetrant Testing (PT)
- Magnetic Testing (MT)
- Visual Testing (VT)
- Eddy Current Testing (ECT)

Volumetric indications, meaning discontinuities inside materials, can be found using

- Radiographic Testing (RT)
- Ultrasonic Testing (UT)

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LEARNING OBJECTIVES &
KEY BENEFITS OF ATTENDING THE WORKSHOP

By attending this technical training on **"NDT-Introduction"** delegates will be able learn and deliver the following things.

- ✓ **Explain the varying certification schemes for NDT personnel**
- ✓ **Explain the basic physics and mechanics behind basic NDT methods including visual testing, penetrant testing, magnetic particle inspection, ultrasonic testing and radiographic testing**
- ✓ **Explain the advantages and disadvantages of the above NDT techniques**
- ✓ **Understand the type of flaws that can be detected by the above NDT techniques**

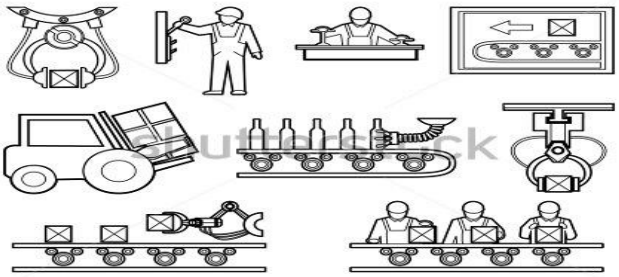
WHO SHOULD ATTEND ?

This course will provide practical understanding as well as techniques for NDT-Introduction of the various types of industrial rotors in-place in the plant. People in the following roles should participate in this training:

- ✓ **Engineers, auditors, managers, quality personnel and newcomers to NDT**
- ✓ **Manager – Maintenance / Process/ Quality /Technical/Reliability**
- ✓ **Engineer - Maintenance / Process/ Quality/ Technical/Reliability**
- ✓ **Supervisor - Maintenance / Process/ Quality/Technical/Reliability**
- ✓ **Front-line Leaders**
- ✓ **Mangers – Business Essentials such as HR, Supply chain, Purchase, Finance etc.**

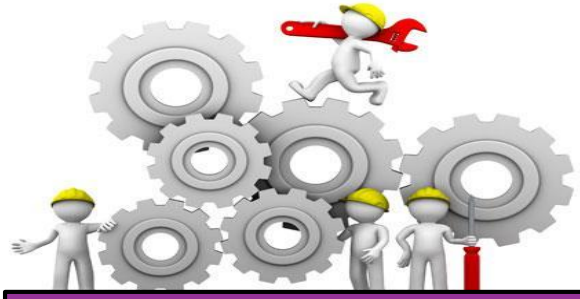
INDUSTRIES THAT CONCERN ABOUT

LOW PRODUCTIVITY



Conventional use of time-based approach for maintenance does not take into consideration the way assets are being utilized, their current condition and real world operating conditions.

HIGH DOWNTIME



Failure to curb unplanned downtime and lack of control over value chain processes lead to high costs , inefficiencies and poor compliance. These severely impacts the profit and industrial growth.

INADEQUATE ASSESS CONTROL

Industries lack the ability to interpret assets data and because of unavailability of proper predictive methods they are unable to predict equipment failures which leads to unplanned downtime.

HIGH MAINTENANCE COST

Increased competition, pressure to grow revenue & profit , tighter regulations, scarcity of raw material, fluctuation demand and obsolete technologies have impacted the way industries are being operated.

COURSE OUTLINE

DAY – 1

MAGNETIC PARTICLE TESTING

- ✓ Theory of Magnetic Principles including Magnetic Fields, Flux Leakage, Magnetic Process, Demagnetization and Basic Principles
- ✓ Use of MT Techniques in Industry
- ✓ Methods of Magnetic Particle Inspection
- ✓ Test Preparation, Testing Process, Evaluation and Reporting

ULTRASONIC TESTING

- ✓ Basic Theory of Ultrasonic Testing.
- ✓ The fundamentals of piezoelectric crystals and the sound they produce.
- ✓ How sound reacts to discontinuities.
- ✓ The fundamentals of Reflection and Attenuation.
- ✓ Calibration of various search units.
- ✓ Longitudinal Wave (Straight beam) Inspections for discontinuities and wall thickness measurements.

DAY – 2

LIQUID PENETRANT TESTING

- ✓ Theory of Liquid Penetrant Testing.
- ✓ Equipment and Type of penetrant combinations.
- ✓ Types of Discontinuities found via PT.
- ✓ Testing Preparation, Testing, Evaluation and Reporting

VISUAL INSPECTION

- ✓ Theory of Visual Inspection and the mechanics of the human eye.
- ✓ Proper Illumination
- ✓ Various discontinuities that may be encountered.
- ✓ Visual tools, gauges and measuring devices.
- ✓ Advanced VT devices.

REVIEW & Q/A

DAY – 3

RADIOGRAPHY TESTING

- ✓ Non-conventional Radiography,
- ✓ Techniques in radiography
- ✓ Codes, standards and Procedures
- ✓ Acceptance Standards,
- ✓ Manufacturing processes and discontinuities
- ✓ Interpretation of Radiographs

RADIOGRAPHIC FILM INTERPRETATION

- ✓ Review Of The Radiographic Variables Related To Film Interpretation
- ✓ Film
- ✓ Radiographic Viewing
- ✓ Radiographic Image Quality
- ✓ Exposure Techniques

POST ASSESSMENT

PROGRAM SCHEDULE

09:00 -10:30	Morning Session 1	13:30 -15:00	Afternoon Session 1
10:30 -11:00	Refreshments & Networking Break	15:00 -15:30	Refreshments & Networking Break
11:00 -12:30	Morning Session 2	15:30 -17:00	Afternoon Session 2
12:30 -13:30	Lunch	17:00 -17:30	Day review & Q/A