

# Non-Destructive Testing, Principles and Applications (NDT)

## INTRODUCTION

Nondestructive testing (NDT) is concerned with a very wide range of practical problems, from detection of defects to the most sophisticated characterization of materials and system behavior. NDT is a very basic inspection tool of industry because of its ability to detect defects in the early stages. Today there is a great deal of effort made to improve the application of NDT and it is hoped that better definition of how the method is applied will lead to more consistent and better results being achieved. One aspect of this is in training and teaching of operators, inspector's supervisors and engineers in the details of the method. The knowledge of NDT will be helpful for any technical person while performing his regular jobs. The course has been prepared on the assumption that the participant has little or no prior knowledge of NDT.

## OBJECTIVES

Upon completion of this short course, the participant should be able to Know

- Basic principles of NDT
- Procedure to perform common NDT techniques
- Applications and limitations of each techniques
- Application and selection criteria of each technique
- Codes and standards applicable
- Safety aspects of NDT
- Read and understand inspection instructions and reports

## PRESENTER

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Mohammed Maqbool Ahmed, received his M.Sc in mechanical engineering from the University of Gulbarga, India, in 1994. He is a registered professional engineer and an active member of several professional bodies such as ASNT (American Society of Non-destructive Testing), BINDT (British Institute of Non-destructive Testing), ISNT (Indian Institute of Non-destructive Testing) and IEI (Indian Institute of Engineers). He has very high profile of NDT & Welding Inspection certification and experience.

Currently, he works as research associate at Materials Technology Unit University of Qatar, Doha, Qatar. He is also providing consultation services in the fields of Welding and NDT for different companies in Qatar.

## PROGRAM

### DAY ONE

- Introduction to NDT
- Defects Characterization
- Basic principle of Liquid Penetrant and Magnetic Particle Testing Techniques
- Advantages and limitations of Liquid Penetrant and Magnetic Particle Testing Techniques.
- Equipments used for Liquid Penetrant and Magnetic Particle Testing Techniques.
- Control checks on equipments performance.
- Interpretation of test results

### DAY TWO

- Basic principle of Ultrasonic Testing Techniques
- Properties of Sound
- Advantages and limitations of Ultrasonic Testing Techniques
- Equipments used for Ultrasonic Testing Techniques.
- Control checks on equipments performance.
- Interpretation of test results.

### DAY THREE

- Basic principle of Radiographic Testing Techniques
- Properties of Ionizing Radiations
- Ionizing Radiation sources used in Radiographic Testing Techniques
- Properties of X and gamma rays

- Advantages and limitations of Radiographic Testing Techniques
- Control checks on equipments performance.
- Types of Radiographic techniques
- Interpretation of radiographic films.

### DAY FOUR

- Basic principle of Eddy Current Testing Techniques
- Properties of electricity
- Advantages and limitations of Eddy Current Testing Techniques
- Equipments used for Eddy Current Testing Techniques.
- Types of probes used in Eddy Current Testing Techniques
- Interpretation of test results.

### DAY FIVE

- Basic principle of Other Non destructive Testing Techniques such as Leak Testing, Acoustic emission testing, Visual Testing, Thermography, etc
- Comparison between different Non destructive Testing Techniques
- Selection Criteria of Non destructive Testing Techniques
- Case studies
- Theory of Radiographic Testing
- Theory & Practical of Interpretation of Radiographic Film
- Theory & Practical of Ultrasonic Testing
- Theory & Practical of Eddy Current Testing