UNIT-3

SYLLABUS

Visual inspection, Liquid penetrant test, Magnetic particle test, Thermography test - Principles, Techniques, Advantages and Limitations, Applications. Radiographic test, Eddy current test, Ultrasonic test, Acoustic emission- Principles, Techniques, Methods, Advantages and Limitations, Applications.

3.1. OVERVIEW OF NDT

- Non-destructive testing (NDT) is a testing and analysis technique used by industry to evaluate the properties of a material, component, structure or system for characteristic differences or defects and discontinuities without causing damage to the original part.

- NDT also known as non-destructive examination (NDE), non-destructive inspection (NDI) and non-destructive evaluation (NDE).

1. IMPORTANCE OF NDT

- To Accident prevention and to reduce cost.
- For routine or periodic determination of quality of the plants and structures during service.
- To determine acceptance to a given requirement.
- To give information on repair criteria. To ensure product reliability.
- To ensure the safety of operation.
- To ensure customer satisfaction and to maintain the manufacturer's reputation.
- To control manufacturing processes and lower manufacturing costsTo maintain uniform quality level,

2. ADVANTAGES

i) Reusable

- There are a number of distinct advantages, the most obvious of which that the pieces being tested are left undamaged by the process, allowing an item to be repaired rather than replaced should any problem be found.

ii) Safe

- It is also a very safe testing method for operators, with most techni being harmless to humans, although some types of test - radiographic testing-still need to be conducted under strict conditions.
- This testing technique can also help prevent injury or fatalities by ensure such structures, components and machinery is safe.
- This testing technique also offers operators peace of mind, knowing the equipment is functioning as it should, preventing future accidents determining any measures that can be taken for life extension.

iii) Accurate

- Non-destructive testing is also a very accurate way of inspection since the tests are repeatable and a number of tests can be used together to correlate results.

(iv) Cost effective

- These testing methods are also economical. Unlike destructive testing NDT is cost effective as it can prevent the need to replace an item before malfunction occurs without destroying the piece itself.

(v) Quality control

- It is also useful for testing of welds and verification of welding procedures to ensure that a welding process has been completed to the correct specification within the bounds of quality control, for example to make sure that the base metal has reached the correct temperature, cooled at the specific rate and that compatible materials have been used to prevent welding defects.

4. STAGES OF WORKING IN NDT

1. Testing

- The first step testing involves in preparation of test material. With help of primary source (dye, ac source, loading), probe, receiver etc. the material is surveyed.

2. Recording & Reporting

- The most of output is displayed in computer.

3. Interpretation & Evaluation

- Based the output report, remedial action is take place and service life in also determined.

TESTING

REPORTING

INTERPRETATION

EVALUATION

NDT PRCEDURE FLOWCHART

NDT work flow chart