Comparative analysis between Ancient and present non-distractive testing methods in the fields of Mechanical and civil Engineering

B.Koteswararao

Abstract— India is the world ancient country it has its own manufacturing technics and testing methods. This paper showing how the olden Non-distractive technics modified into new methods. In accumulation to those methods a complete detail given about NDT-II and NDT-III. The olden house construction methods, road construction methods and war weapons manufacturing process discussed. The modern all NDT methods compared with Ancient Technics. The Indian Famous Epics Sriramayanam and Mahabharathm gave the required date. Ancient Dwarka city is all gave so many details to complete this article and also discussed in the filed of structural engineering, concrete testing, composite materials and quality testing.

Keywords: Ancient; India; Mahabharathm; NDT; Sriramayanam.

INTRODUCTION

Every manufacturing industry should have to test its products based on specifications to measure the eminence of the product. In the present Kali yuga upto 17 th century we ensured not have specific instruments to measure the products with out distracting. When the NDT concept introduced it brought so many advancements, safety features and also reduced wastage of material in the field of manufacturing and construction. It starts new era in the technology to produce more goods innless time with accurate dimensions

NDT indicates Non-distractive testing which means the testing occur without breaking or distraction of the specimen. The NDT Methods [1] and its applications are as follows. Basically, NDT categorised into two ways NDET Level-II and NDT Level-III. The Level-II tests are [1]

1. Magnetic particle test (MT),
2. Liquid penetrant test (PT),
3. Radiographic test (RT)
4. Ultrasonic test (UT),
5. Electromagnetic test (ET) and
6. visual testing (VT) etc.

Visual testing needs adequate brilliance of the exam external and correct eye-sight of the sample.

The Level-III tests are as follows [1]

1. Acoustic emission Test (AE)
2. Guided wave Testing (GW)
3. Neutron Radiographic Test (NR)
4. Thermal /Infrared Test (IR)
5. Magnetic Flux Leakage (MFL)
6. Vibration Analysis (VA)
7. Laser Testing Methods (LM)
8. Leak Testing (LT)

Standing of NDT: It dramas an significant role in the eminence control of a merchandise.

LITERATURE REVIEW

So many researched done on NDT in various fields like Power sector, Manufacturing sector, Defence sector, construction field and inspection sector.

Akhtar, S. et al [5] gave a review on concrete structure and its condition motoring technics by the use of NDT methods.

Helal, J., [6] et al review the common NDT methods in Structural industry. The empirical relationship provided gave unsatisfactory results when compared with manufacturer.

Agunwamba,[7] et al done a study on comparison on rebound hammer and ultrasonic pulse velocity in concrete testing. A sample of eight and two mixtures analysed in this article. It explains the rebound hammer properties when concrete mixtures and also sensitivity of ultrasonic pulse velocity when concrete gain strenth

Grosse, C. U[8] et al evaluated NDT techniques in CFRP bonding. The results obtained based on robin test. The CFRP materials used in various fields like aviation, rotor blades and automobiles.

Koteswararao, B[9] et al used NDT methods for testing of the specimen. They used C-Scan instrument for testing of the Copper-copper specimen. It used for detecting internal welding join defects and molecular behaviours after load application

Jolly, M. R.[10] et al reviewed NDT techniques in Composite thick walls. This include so many reviews like flywheel effects, robot hand effects. The over view done in radiography test, ultrasonic test and thermography.

Ravi, D.[11] et all used NDT testing methods for various materials at different load conditions. The manufacturing defects identified by NDT methods.

These all researches completed on the existing

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B.Koteswararao, Lecturer, Department of mechanical Engineering, Maddawalabu university, Bale robe, Ethiopia-247 (Email : basam.koteswararao@gmail.com)

problems. These studies show the application and use of NDT Techniques in construction field, concrete technology, structural engineering, CFRP composites, quality testing and inspection. Where as there is no specific research on ancient India and its manufacturing technics.

COMPARATIVE DISCUSSION WITH ANCIENT INDIA TECHNOLOGIES

India technically developed country. According to Indian epics India having Kruta yuga, Tretha yuga, dwapara yuga and kaliyuga. From the beginning of Indian history, the ancient people used to manufacture their home need things. When the centuries completed the technology also updated in the form of war weapons making, coin printing, currency printing.

Let us compare the modern technologies like internal combustion engines with ancient horse carts. Those does not have any pollution and also the quality of the cart suitable for those people with eco friendly output that was animal dunk. Whereas now this IC engines emitting more pollution which h causing global warming and ozone layer depletion. Here is the lot of gap in transportation. May be by the next century we can get eco friendly vehicles like electrical cars, solar vehicles or magnetic vehicles.

The war weapons manufactured by the technic based weight analysis. Heavy materials like doll, body shields and helmets they used technic called vibration analysis.

The construction of dams or houses they used method of strength analysis by physical test with distractive method. Most common material used wood. The famers can say directly about its quality by looking. It is like visual test in NDT.

The bow, arrows, knives and mace were used for wars. Those quality tested by the blacksmith person with their own techniques those methods still not full filled by present NDT methods.

The house construction methods and its applications also much more different. The brick testing method they used was almost same in the present days expect strength analysis. To test the quality of the brick they used to immerse sample brick in the water for some time.

The ancient houses constructed by the use of white cement its not present one. The mansion himself know the quality of the walls, slab and life time of the house. Even now a days in the villages the houses having 120 years 150 years with out damage after facing so many floods and cyclones.

When there were wars, they can get target at a distance of 200 metres,300 metres and 500 metres with the help of bow and arrow. That greatness not only the archery person but also blacksmith. The quality manufacturer taken care a lot while manufacturing the bow and arrows.

The Dwarka city is the great example to the Indian construction standards. Even though we have plenty amount of constructions but the great Dwarka is fulfilled all modern testing's and visible to every one now a days. It sank in the salt water but the pillars, roads and houses we can see still in ocean. Those thins with stand so many earth cakes, tsunamis, tides and floods. Still the city is there under the water.

The RAMSETHU is another best example of our ancient people construction method. They constructed with wood, sand and stones. It was sunk by water so many years ago. Where as the quality of the RAMSETHU is very fine. Even the governments thinking to make a road on RAMASETHU.

Like this we have plenty number of ancient technics involved in every work. Those things simply we cannot suspect.

CONCLUSION

The modern NDT methods having so many applications even though still there is testing gap especially in roads and bullet proof things. These NDT-II and NDT-III methods not at all suitable for the next century. The scientists and engineers should have to adopt more technics from our Indian epics like Sri Ramayanam and Mahabharathm. The Ancient Dwarka city is the best example for our ancient construction standards. Weapons used in the war also another great thing of our Indians when there were no so-called NDT methods they made accurate and extraordinary things with the help of our prehistoric people thoughts.

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