Suggested Study Topics
Level II Ultrasonic Testing - General Certification Examination

Note: This is not a complete list of the topics that may be covered on a certification examination. It should be used only as a guide to assist you in preparing to take a certification examination exam.

1. General knowledge of ultrasonic testing application including how to define ultrasonic testing
2. Testing frequency used for ultrasonic testing (relationship to sensitivity and penetration)
3. Ultrasonic testing terms (i.e. velocity, dBs, refraction, frequency, wavelength, attenuation, piezoelectric, impedance, cps, microseconds, scatter, etc)
4. Components of a UT system / instruments
5. Purpose and general method of calibration
6. The purpose and importance of couplant(s)
7. Characteristic of materials and relationship to sound travel (i.e. grain size, density etc)
8. Components and types of the transducers
9. Wave modes and general application (i.e. longitudinal, shear, lamb, etc)
10. Principles of sound penetration and frequency
11. Near, far fields and dead zone
12. Typical pulse echo, angle beam and through-transmission testing application
13. UT presentations (know the differences between A,B and C displays)
14. Familiar with UT codes and specifications (i.e. ASME, API, ASTM etc)
15. The purpose of piezoelectric material
16. What modes of UT is used for thickness testing
17. Basic formula for determining the impedance in a material
18. Converting microseconds to seconds
19. The difference between single and dual element transducers
20. The importance of having a written procedure when doing inspection (as per requirements like ASME)
21. General awareness of codes like API, ASME
22. Method of measuring thickness of a curved part
23. How to minimize the dead zone (i.e. using a delay tip)
24. Type (description and affects) of UT indications for corrosion, material lost, wear, laminations, pitting
25. What occurs when testing a material that is too thin for the transducer

Reference Sources:

- Nondestructive Evaluation and Quality Control Vol. 17
- Handbook of Nondestructive Evaluation – CJ Hellier McGraw-Hill
- ASTM 1316 – terms used in nondestructive testing
- http://www.ndt-ed.org/index_flash.htm NDE/NDT Resources
- www.asnt.org – American Society for Nondestructive Testing