

REPORT ON THE SYMPOSIUM ON  
NONDESTRUCTIVE TESTING STANDARDS  
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A symposium on nondestructive testing (NDT) standards reflecting widespread current concern with this area was held at the National Bureau of Standards (NBS) May 19-21, 1976. The symposium was co-sponsored by the National Bureau of Standards (NBS), the American Society for Testing and Materials (ASTM), the American Society for Nondestructive Testing (ASNT), with the American National Standards Institute (ANSI) cooperating. The meeting provided the first general forum encompassing discussions on the processes by which NDT codes, standards, and specifications become accepted, and discussions on the status and needs that exist in all NDT methods. Major themes included standards documents, the status of standards in the major methods used in NDT and future directions.

The initial series of papers were devoted to standards documents preparation by such authoritative bodies as ASTM, ASNT, and ANSI giving recommended practices and procedures, and on the needs in this area of various society and government organizations. C. H. Hastings (Army Materials and Mechanics Research Center) outlined the problem of NDT specifications in military standards. He estimated that there are probably 0.25 megaspecks existing in the Department of Defense, a situation attributable to the relegation of NDT specifications and procedures to the low tiers of the procurement/specification pyramid and to the writing of NDT specifications by non-NDT personnel. The important matter of nondestructive testing personnel and the certification of their qualifications were discussed by F. C. Berry (Chicago Bridge and Iron) from his vantage point of ASNT personnel certification experience.

The bulk of the papers dealt with standards for the major NDT methods including radiography, ultrasonics, acoustic emission, liquid penetrants and magnetic particles, visual and optical methods, electromagnetic testing and leak testing. Because of the interest of the ARPA/AFML program in ultrasonic and acoustic methods, we will mention some contributions in these areas.

In his review of the NBS program in NDT standards, H. Berger (NBS) noted that a recent round-robin program initiated by NBS revealed unexpectedly large variations in the results obtained with different sets of aluminum reference blocks. These discrepancies were traced to variations of velocity and attenuation in the material. It was announced that there would be soon available for loan from NBS a set of certified test blocks.

The role of the transducer and ultrasonic instrumentation in obtaining reliable results was discussed respectively by J. T. McElroy (Southwest Research Institute) and C. E. Burley (Reynolds Aluminum). Efforts to improve reproducibility in acoustic emission were discussed by W. F. Hartman (Trodyne Corp.).

The final series of papers dealt with future directions and included discussions of quantitative test results. Methods for quantitative ultrasonic standards based on the theory of ultrasonic scattering from a spherical inclusion or void were described by B. R. Tittmann, D. O. Thompson and R. B. Thompson (Rockwell International Science Center). Other speakers discussed the needs for improvement in techniques, equipment and standards. As emphasized by E. T. Wessel (Westinghouse Research Labs.), such improvements are needed if fracture mechanics as a method for establishing an acceptable flaw size is to play a future role in quality control.

Among the general comments voiced at the Symposium, concern was expressed regarding the added cost of NDT testing, and that NDT standards may engender an unwarranted sense of reliability in products conforming, in fact, to inadequate standards. In discussing the economic benefits of NDT to a manufacturer, J. E. Doherty (Pratt and Whitney) pointed out that improving the yield of an acceptable product would reduce unit cost. Although some expressed the view that NDT standards are presently inadequate and the efforts are overlapping and uncoordinated, many others expressed the belief that effective and realistic NDT standards are not only possible but essential.

A question that was implicitly raised but not directly addressed was the role of the government in the generation and imposition of NDT standards. It may be expected as a result of the Alaskan pipeline problem that there will be greater awareness and greater focus on NDT inspection. As evidence of government interest in NDT are two proposed congressional bills: The Tunney-Hart bill in the Senate; and the Teague bill in the House, which recognize that NDT plays a role in material conservation.

In summary, the increasing awareness of the benefits of NDT and the need for higher confidence in its results are causing attention to be focused on code specifications, procedures, and personnel certification, and are causing standards and code generating groups and others to re-evaluate existing standards and recognize the need for new ones.