7th European Conference on Non-Destructive Testing, 26-29 May 1998

Volume net 1998 Aug, Vol.3, Issue No.8, 1998, Pages 1258-1266

CESOP: Computer Aided Ultrasonic Testing with Expertise and Arc Welding Parameters Optimization

F.BETTAYEB, K.Alem, B.MAAMACHE

Abstract: In metallic constructions, the assemblage techniques are in continual evolution dealing with the technological progress. However one can not insure the quality of an assemblage without proceeding to a quality control. A comparative study on DDT methods, presented during the SMIRT10 in Montrey 1989 has shown that the radiography appears better than the manual ultrasonic testing for the detection of almost welding defects type. Neither it is efficient for the diagnostic, the manual ultrasonic testing gives performances about 50% of detection. On the other hand, the mechanized or automatic ultrasonic testing, insures a probability of detection for plan or volume defects in the order of 80%.On the basis of these estimations, we have judged that it would be judicious to encourage the automatic ultrasonic testing. For this purpose and in the goal to approach the ultrasonic testing method by the radiography on adopting the imagery and the signal processing to the ultrasonic techniques, we present the system, that allows the interpretation automation of the ultrasonic signals identified (1), and simulates the recognition of the defect shape according to the radiography principle (2). Results of this interpretation, provided by << ARCUS >> will be confided to the expert system << SYSO >> (3) for the diagnostic of the defects causes. The exploitation of<< SYSO >> has shown that, a bad determination of welding parameters is the most current defect cause. The << OPTIMA >> system, modeled on the computer methods basis, help to the optimization of the arc welding parameters. These three [3] processes << ARCUS >>, << SYSO>> and << OPTIMA >> cooperate through coupling interfaces to create the: Computer aided Ultrasonic Testing, with Expertise and Arc Welding Parameters Optimization, called << CESOP >>,whose purpose is improving the arc welding quality and increasing as well as the security of the assembled construction.

Keywords : Welds, During Manufacture