1.10.15. ULTRASONIC TESTING OF ALUMINOTHERMIC WELDED JOINTS OF RAIL TRACKS

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The rail tracks are extremely important part of the infrastructure of a railway system. Increase in the speed of trains, the axial loads of vehicles, the traffic density and ecological issues are intensifying the requirements for high quality of rails. The quality of new rails is regulated by EU standard UIC 860 V–1996 (4 types of steel) and European Standard EN 13674–2003. When in service, the rails are submitted to high internal and external stresses of various types, strength, frequency and direction. The weak points on track are considered to be the welding points, which is the reason why the Long Rail (LR) is produced and installed. The aluminothermic method is usually used for welding of the rails joints in service. The welding of the rail tracks in service is required to be as short as possible in order to keep the disruption of traffic to the minimum. The possible flaws that can occur in welded joints are of the following nature:

– human errors in execution;
– deviation by chemical reaction and casting (metallurgical defects).

The rails have very complex configuration and its necessary to establish following:

– the critical points in cross section of the rail;
– expected deviations (location, type and extent).

The ultrasonic testing represents the most suitable technique for discovering, locating and identifying the faults. In this work is includes the SWOT analysis of advantages and shortcoming when using the ultrasound for testing the faults in welded rail track joints. Some characteristic examples of the faults discovered by using ultrasound and confirmed by the metallographic method of inspection have been included. The summarised procedure introduced at the end represents all phases of process thus ensuring the adequate reliance in examination of the quality of the welded rail track joints.