

1.3.10. ESTIMATION OF STRUCTURAL-PHASE CONDITION OF WELDED JOINTS BY SPECTRAL-ACOUSTIC METHOD

Smirnov A.N., Muraviev V.V., Folmer S.V., Ababkov N.V., Russia

This work is presented in definition of surface acoustic waves employment possibility for estimation of stressed-deformed condition of long-term working welded joints of power equipment on their origin stage inside the welded joint metal in the operation process on different stages of life cycle with the nondestructive testing employment.

Welded joints were investigated by raster- and electronic microscopy. Acoustic characteristics were measured with “Astron” – multipurpose acoustic system.

The determination between the density of bending-torsion contours that were created with the internal stress fields sources, the quantity of stresses and the long-term strength of investigated steel was revealed. By spectral-acoustic method it was established the maximal delay time of the surface acoustic waves was fixed in welding thermal influence zone and was caused by attenuation of ultrasound vibrations on local long-range internal stress fields sources. Microstructure change of long-term technical equipment welded joints metal and structural damage accumulation in exploitation process results in change of acoustic characteristics.

Thus, the analysis of research result shows high sensitivity of spectral-acoustic method for the microstructure parameters change definition and internal stress fields in welded joints.