

Detection of the Propagation of Defects in Pressurized Tubes through the Test of Acoustic Emission using Artificial Neural Networks

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KEYWORDS

Propagation of Defects; Pressurized Tubes; Acoustic Emission; Pattern Recognition; Artificial Neural Networks.

ABSTRACT

The acoustic emission test has distinguished relevance among the non-destructive assays and, therefore, existing research abound at present aiming at the improvement of the reliability of their results. In this work, the methodologies and the results obtained in a study performed are presented to implement pattern classifiers by using artificial neural networks, aiming at the propagation of existing defects in pressurized tubes by means of the Acoustic Emission assay (AE). Parameters that are characteristic of the AE signals were used as input data for the classifiers. Several tests were performed and the classification performances were in the range of 80/90% for most of the instances analyzed. Studies of parameter relevance were also performed and showed that only a few of the parameters are actually important for the separation of the classes of signals corresponding to *No Propagation* (NP) of defects and *Propagation* (P) of defects. The results obtained are pioneering in this type of research and encouraged the present publication.