عنوان مقاله:

A Simulation Study of Attenuation Factors in a Gas Pipeline Guided Wave Testing

محل انتشار:

چهارمین کنفرانس بین‌المللی آزمون‌های غیرمخرب ایران (سال: 1395)

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نویسندگان:

M. J. Ranjbar Naserabadi - *MSc Graduate, Faculty of Technical Inspection Engineering, Petroleum University of Technology*,

B. S. Hayatgheib - *MSc Graduate, Faculty of Technical Inspection Engineering, Petroleum University of Technology*,

Sina Sodagar - *Assistant Professor, Faculty of Technical Inspection Engineering, Petroleum University of Technology*,

خلاصه مقاله:

Damage detection capabilities in pipes are under influence of attenuation factors as high values of attenuation and large variability with pipe condition result in unpredictable guided wave test (GWT) range. In this paper, an accurate finite element model (FEM) is prepared by applying pigging data of a gas pipeline for simulating existing local and pitting corrosion areas including material properties and thickness loss. The scanned data can be processed with reduction in radius against circumference and axial direction. Importing pigging datasets to ABAQUS software is carried out by use of Python scripting in order to automatic assignment of material properties for each single element of the model. Finally, the effects of attenuation factors such as scattering due to corrosion damages, material damping of coating and leakage into surrounding soil media are investigated through exciting longitudinal L(0,2) and torsional T(0,1) modes. The attenuation values are found to be larger for T(0,1) mode in all of the investigated cases.

کلمات کلیدی:

Guided wave, Finite element method, Pipeline, Pigging Data