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SELF AND MUTUAL STATEMENT AND TRANSITIONAL INDUCTANCES OF TRANSIT INTERNAL CIRCULAR EDDY CURRENT TRANSFORMER IN A LEADING PIPE

The question of the technical pipelines state monitoring for providing the reliability and safety of energy materials supply (natural gas) by main pipelines acquires all greater actuality because of the considerable degree of abrasion and aging of domestic oil-gas complex equipment.

The basic task of the technical diagnosticating of pipelines is establishment of actual thickness of pipe wall and exposure of defects like violation of integrity. For the carrying of the technical diagnosticating works on the whole length of pipeline with minimum pipeline outages the most effective way is realization of inwardly pipe diagnostics with the use of intellectual pistons which move under pressure of the transport product. However inwardly pipe diagnostics with the use of magnetic pistons, needs improvement, for providing higher control exactness and accuracy.

Contactless, absence of remaining magnetic effects and possibility to find out superficial cracks with the small opening and defects of stratification of pipeline metal advantages of eddy current method of control

A task of determination of statement and transitional parameters of internal transit eddy current transformers of self-reactance and transformer types at an impulsive feed in order to receive multi-parameter information about the object of control is actual.

While controlling the geometrical sizes, defects and physical and mechanical parameters of electrical conduction materials, details and products (pipes) by an impulsive eddy current method the informing parameters of primary transformer are its transitional self and mutual inductances of excitation and measurable winding and their response characteristic to the parameters of control object.

Expressions for self and mutual operator (converted by Laplace) and transitional basic and inserted inductances of excitation winding of the communicating screened circular primary transformer rectangular transversal to the cut into the controlled leading pipe with the current of free-form which is used as a primary transformer for diagnosticating of the technical state of internal surface of pipelines.

On the basis of operator inductances characteristic their approximate rotation of Laplace transforming for the receipt of the transitional inserted in inductances offered.

The obtained results are expedient to use for determination of informing sizes of primary characteristic to measurable circle with transit primary eddy current transformer and their response the parameters and defects of control object on purpose of compartmentation of multi-parameter information.