



The self potential of underground heating system pipeline

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Underground heating system pipelines are the component part of the municipal infrastructure in cities. The citizen everyday life in many respects depends on safe functioning of the heating supply system. The low reliability of heating system web represents one of the principal problems in normal heat supply in Russian and CIS countries cities, also in some of East European countries (Baltic countries). Pipe's defects can appear on any section of pipeline on account of irreversible physicochemical processes of deterioration and destruction of pipe's isolation coat and metal. Therefore, the important tasks for heating supply enterprises are the decrease of emergency conditions, reduction of the failure number in heating system pipelines functioning. The many years' experience of heat transportation system aging process observation made by authors allows us to make a conclusion that the basic destruction factor for underground heating system relates to external pipe's corrosion. In the judgment of authors, the actual condition of underground pipelines can be estimated at properties of physical fields, which appear over pipelines with destructed hydro- and heat-isolation, and presence of corrosion processes. The integrated heat flow normalized to pipe's surface can be considered as an energetic attribute of the loss of the heat-protection conditions by pipe's coat. The activity of corrosion processes can be rated on the self potential value and the character of electrical field produced by buried pipeline. The geophysical self potential (SP) method is likely to use to study the electrochemical fields over underground pipelines. The physical model of isolated underground pipe was made by authors to rise the reliable of field results interpretation. This model contains equivalents for principal underground pipeline elements. The trustworthiness of the model was made by comparison of modeling results with the electrical fields observed over visual inspected pipelines.