PUT PAPER TITLE HERE EXPERIMENTAL STUDY FOR NON-INVASIVE PIPELINE LEAK DETECTION AND LOCALIZATION IN NOISY ENVIRONMENT

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ABSTRACT

An innovative non-invasive method for pipe leak detection and localization in noisy environment is presented in this paper. Nowadays, it is well known that complex pipeline networks are used for operational purposes and fluid transportation in every high-end technology heavy industry such as refineries, combined heat and power cycles, cement and steel industries, etc. In all these cases, safety is the key parameter in order to ensure the efficient plant operation and to avoid any possible accident with devastating consequences that may lead to a turn down of the production process. For this reason, it is mandatory to develop reliable enough methods for detection of fluid leakages which represent the most common threaten in pipeline networks.

INTRODUCTION

Towards this direction a certain algorithm was developed in order to detect and locate the artificial leakages that made in an experimental setup (figure 1) that was built for the purposes of the present study. The test rig operates with pure water and consists of 120 m of steel pipes in the diameter of 10 cm, 27 holes which are scattered/dispersed in certain distances and represent the leakages, data acquisition equipment and a room that hosts all the appropriate electro-mechanical component such as the feeding-pump, the circulation-pump, the inverter, the water heater and the expansion tank. Apart from the high-efficient accuracy of the developed algorithm in the leakage detection and localization, the proposed method was designed with extra focus on the reduced CAPEX and OPEX costs.

RESULTS AND DISCUSSION

Finally, according to the results the proposed system gives sufficiently low false alarm regarding the leakage detection, while the mean percentage error of the leakage localization is around 6% which may be considered as an acceptable value.

Figure 1. Experimental setup for pipe leakage detection and localization

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