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Researchers Develop New Method to Measure Bubble Size Distribution in Pipelines

Published on May 16, 2012 at 8:33 AM

By Gary Thomas

The University of Southampton has carried out a new research and developed a new process to precisely measure gas bubbles present in pipelines.

Measuring gas bubbles in pipelines is considered to be significant in petrochemical, power and manufacturing industries. When petrochemicals are being harvested from the seabed, it is important that personnel are alerted if there are bubbles present in the crude oil. Since if these bubbles are brought up from the seabed, a high-pressure region to the rig surface, a low pressure region, the bubbles may expand and result in a blow out. The release of oil or gas or both suddenly from a well is called a blow out.

Sending sound waves via the bubble liquid and comparing the calculated attenuation of the waves with that estimated through theory is the prominent method that is being currently used for calculating the gas bubble size distribution (BSD).

A new method has been developed by a research group, led by Professor Tim Leighton from the University of Southampton's Institute of Sound and Vibration Research. Professor Tim Leighton and his team were specifically commissioned to carry out the work, as part of a current program, in order to develop methods to precisely calculate the BSD for the steel pipelines, filled with mercury, of the target test facility (TTF) of the Spallation Source (SNS) at Oak Ridge National Laboratory (ORNL) in USA.

The research is exploring on how to invert the measured attenuations and phase speeds in bubbly liquid present in a pipe to calculate the BSD. This new method gives good estimations of BSD, provided with suitably wide range of frequency.

Professor Leighton has stated that the engineers at the SNS plant are considered to introduce correct size and number of helium bubbles to the mercury in order to absorb the shock waves before striking on the wall, therefore the cavitation bubbles will not cause steel erosion. ORNL and the [Science](#) and Facilities Research Council specifically commissioned the team as a part of the program to develop devices for confirming whether their bubble generators can possibly provide the bubbles in correct number and size to the location, where the pipelines can be protected from erosion, according to him.

Source: <http://www.southampton.ac.uk/>

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