



Contribution ID: 72

Type: **Talk**

Investigation of the cold process pipe rupture mechanism

Thursday 22 September 2016 16:05 (20 minutes)

Cryogenic process pipelines are part of the basic subsystem used in installations for fundamental research in physics, as well as in industrial plants which use LNG or liquid nitrogen. The significant increase in importance of cryogenics entails the need to explore phenomena which have direct impact in the design process of cryogenic systems and their safety systems. These aspects are of high priority due to high investment costs, mainly because of safety issues and reliability.

One of the issues which requires thorough investigation is the fracture mechanics of gas pipelines in cryogenic conditions. For this subject, importance is placed not only in when the cracks begin to appear, but also in how they form and how quickly they propagate. Currently, there is a lack of reliable research in the available literature in this area. This is often raised as a significant problem for designers, because knowledge in this topic should be reflected e.g., in the sizing calculations of safety valves for the vacuum systems.

This presentation includes a review of the fundamentals of pipe cracking models, the impact of this phenomenon on the safety system design process, the concept of the test stand, and the method in which these studies have been conducted. The results of this research will be able to improve the selection of safety devices in cryogenic systems.

Primary author: DZIEWIECKI, Maciej (Wroclaw University of Science and Technology)

Co-author: POLINSKI, Jaroslaw (Wroclaw University of Technology)

Presenter: DZIEWIECKI, Maciej (Wroclaw University of Science and Technology)

Session Classification: Risk assessment

Track Classification: Cryogenic Safety