



COLLOQUIUM

In accordance with article 4.6.8 of the SSNS-wb.

Group: Engineering Fluid Dynamics

As part of his MSc thesis assignment

Sander van der Veen

will give a presentation, entitled:

Numerical Study of Melting Hydrate Plugs using Direct Electrical Heating

Date: Friday July 29, 2011

Time: 14:00

Room: Horstring N 109

Summary:

In the oil and gas industry increasingly harsh circumstances are encountered in the production and transportation of oil and gas. When a gas and water mixture is flowing through a subsea pipeline a hydrate blockage can form, causing the production to stop. In recent years, a novel technique called Direct Electrical Heating (DEH) has been developed to prevent the formation of hydrates in subsea pipelines by heating the pipeline wall. In theory, this system can also be used to melt a hydrate plug once it is present. However, due to large amounts of gas and water released when melting hydrate, there is a potential risk of over-pressurizing the pipeline, leading to a burst.

In the present study, a mathematical model is developed to describe the process of melting a hydrate using DEH. Numerical simulations have been carried out in order to assess the risk of a potential pipe burst. Important parameters that describe the process are varied to investigate the sensitivity of the system to these parameters. It is found that it is highly unlikely that, under the assumptions of the present model, a pipe burst will occur.

Assessment committee:

Prof.dr.ir. H.W.M. Hoeijmakers (chairman)
ir. J.J. Slot (mentor)
dr.ir. U.C. Klomp (mentor)
dr.ir. R.H.A. IJzermans
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