Contribution ID: **378** Type: **Contributed Oral Presentation**

Numerical and experimental verification of physical blast thermodynamic model

Wednesday, 1 July 2015 15:00 (15 minutes)

Helium inventory in big cryogenic systems may be of the order of hundred tons. During the warm up of the machine the helium has to be stored in warm pressurized tanks. A potential rupture of the tank may create a danger to adjacent objects. In order to formulate recommendations concerning storage of compressed gases in close vicinity of nuclear installations, like tokamaks, a thermodynamic model of physical blast has been formulated [1]. The model has been experimentally verified in laboratory scale test rig. To simulate rupture of compressed gas storage tanks, plastic tanks have been used. Scaling of the results to real cases like ITER compressed gas inventory requires good understanding of potential rupture of high volume gas storage tanks. Numerical model of tanks rupture have been elaborated and verified against experimental results. The model allows scaling of thermodynamic simplified description to real gas storage installations.

[1] M. Grabowski et al. Modelling and experimental verification of pressure wave following gaseous helium storage tank rupture, ICEC-25, Twente

Primary author: Prof. CHOROWSKI, Maciej (Wroclaw University of Technology)

Co-authors: Dr ILUK, Artur (Wroclaw University of Technology); Dr JEDRUSYNA, Artur (Wroclaw University of Technology); POLINSKI, Jaroslaw (Wroclaw University of Technology); Mr GRABOWSKI, Maciej (Wroclaw University of Technology)

Presenter: ILUK, Artur (Technical University of Wroclaw)

Session Classification: C3OrH - Cryogenic Safety

Track Classification: CEC-11 - Safety, Reliability, and Standards