Contribution ID: **149** Type: **Invited Oral (30min)**

[Invited Oral] Controlled Cold Helium Spill Test in the LHC Tunnel at CERN

Wednesday, 9 July 2014 11:00 (30 minutes)

The helium cooled magnets of the LHC particle accelerator are installed in a confined space, formed by a 27 km circumference 3.8 m diameter underground tunnel. The vacuum enclosures of the superconducting LHC magnets are protected by a lift plate against excessive overpressure created by eventual leaks from the magnet helium bath, or from the helium supply headers. A three-meter long no stay zone has been defined, based on earlier scale model studies, on both sides of these plates, protecting the personnel against the consequences of an eventual opening of such a lifting plate. More recently several simulation studies have been carried out modelling the propagation of the resulting helium/air mixture along the tunnel in case of such a cold helium release at a rate in the range of 1 kg/s.

To validate the different scale models and simulation studies, real life mock-up tests have been performed in the LHC, releasing about 1000 liters of liquid helium under standard operational tunnel conditions. Data recorded during these tests include oxygen level, temperature and flow speed measurements as well as video recordings, taken up- and downstream of the spill point (-100 m to +200 m) with respect to the ventilation direction in the LHC tunnel. The experimental set-up and measurement results will be presented enriched with recorded video. Generic effects found during the tests will be discussed to allow the transposal to possible cold helium release cases in similar facilities.

Primary author: KOETTIG, Torsten (CERN)

Co-authors: JEDRUSYNA, Artur (Wroclaw University of Technology); BREMER, Johan (CERN); CASAS-CUBILLOS, Juan (CERN); LINDELL, Karl Gunnar (CERN); DUFAY-CHANAT, Laetitia (CERN); CHOROWSKI, Maciej (Wroclaw University of Technology); GRABOWSKI, Maciej (Wroclaw University of Technology); NONIS, Mauro (CERN); VAUTHIER, Nicolas (CERN); Dr VAN WEELDEREN, Rob (CERN); WINKLER, Tiemo (Twente Technical University (NL))

Presenter: KOETTIG, Torsten (CERN)

Session Classification: Wed-Mo-Orals Session 7

Track Classification: C-17: Safety, reliability and standards