Contribution ID: **2** Type: **not specified**

ECART analysis of the STARDUST dust resuspension tests with an obstacle presence

Monday, 17 September 2018 11:00 (2 hours)

The activated/toxic dust resuspension inside the vacuum vessel of future fusion devices as ITER or DEMO is a safety issue of main concern. In case of a LOVA or a LOCA, dusts produced during the normal and off-normal conditions can be released inside the tokamak building or towards the external environment. These accidents are not expected during the whole lifetime of the ITER machine, though in the past they were considered in the ITER Generic Site Safety Report with a conservative assumption for the lack of reliable resuspension models in the employed safety codes. To relax this strong assumption and validate resuspension models in fusion like conditions, different experimental campaigns in the STARDUST facility were performed at the ENEA laboratories in Frascati (Rome). In the first experimental campaign (2004), the resuspension of Tungsten (W), Carbon (C) and Stainless Steel (SS) dusts was investigated in an “empty tank” configuration, while the resuspension of the same dust types in presence of an internal obstacle was studied in the second campaign (2005). The obtained experimental results stressed that only a minor fraction of dusts is effectively resuspended. In the present work, focalized on the ECART code validation for the safety analysis of future fusion installations, a further step in the assessment of the semi-empirical “force balance” resuspension model implemented in the ECART code against the data obtained during the second experimental campaign (tank with an inner obstacle) is performed. The code predictions are quite in agreement with these STARDUST experimental data, and three charts (one for each dust type) were elaborated to predict the resuspension magnitude basing on the flow velocity on the structure where the dusts are initially collected.

Co-authors: Dr PACI, Sandro (Pisa University); Dr BRUNO, Gonfiotti (Pisa University); Dr PORFIRI, Maria Teresa (ENEA)

Presenter: Dr PACI, Sandro (Pisa University)

Session Classification: P1

Track Classification: Power Plants Safety and Environment, Socio-Economics and Technology Transfer