



Potential tsunami impact on a refinery in North-Eastern Sicily

A.M. Cruz, G. Franchello, and E. Krausmann

European Commission, Joint Research Centre, IPSC, Major Accident Hazards Bureau, Ispra, Italy (Email: ana-maria.cruz@jrc.it, Tel: +39-0332-785381)

Industrial facilities located in coastal areas subject to tsunami hazards may be at risk of tsunami impact and damage. Furthermore, if hazardous materials are present these can be accidentally released impacting nearby residents and dispersing into the environment. We have analysed the potential impact of two tsunami scenarios originating in the Tyrrhenian Sea and their consequences at an industrial facility located on the coast in North-Eastern Sicily. The results of the tsunami simulations indicate that in both scenarios there would be between 30-45 storage tanks at the industrial facility (potentially exposing up to 1.4 million m³ of chemicals) subject to flooding, with tanks closer to the beach suffering up to 1.6 m inundation. Flow velocities in most areas are less than 1 m/s. This indicates that any damage would occur due to hydrostatic uplift forces due to buoyancy particularly in the western part of the facility where inundation levels are higher and storage tanks are less protected. Damage to the facility due to impact of floating debris may be a problem at the eastern most tip of the refinery where the distance between the waterline and the refinery fence line is less than 20 m. Foundation soils and foundation systems could also be at risk from shear- and liquefaction-induced scour in this section of the plant. The likelihood for hazardous materials releases from inundated storage tanks is low but could occur due to breakage of connected pipelines and flanges due to floating off of storage tanks and other connected appurtenances. Flooding of electrical equipment such as control panels, pumps and motors, not raised above the inundation level could suffer water intrusion.