The Technion Center of Excellence in Exposure Science and Environmental Health

מרכז מצוינות בחשיפה סביבתית ובריאות בטכניון

Seminar Invitation

Quantitative Risk Assessment, Risk Reduction and Land Use Planning of and around an Ammonia Terminal

Menso Molag, TNO & Saxion University for Applied Science, The Netherlands

December 21, 2011 at 12:30
Grand Water Research Institute auditorium

Ammonia is an important raw material for the fertilizer and chemical industry. However, most plants do not produce the ammonia on-site but rather import the ammonia from overseas using an ammonia terminal near the import harbour. This is the case in the port of Haifa, where pressurised tankers unload ammonia and transfer it via a pipeline to a refrigerated 20,000 m^3 storage tank. The liquefied ammonia is send from this storage tank to the users via a 6" pipeline.

Ammonia is a flammable and very toxic material. Hence, storage and transport of ammonia poses risks to people in the vicinity of the storage tank and the pipeline. These risks were assessed following a Quantitative Risk Assessment (QRA) procedure by the TNO, the Netherlands, which determined both individual and societal risk levels. The Dutch guidelines for risk assessment will be presented and demonstrated for the ammonia activities in Haifa Port. The influence of risk mitigating measures such as emergency shut down valves and water curtains will also be presented.

In the land use planning, vulnerable buildings (dwellings, schools, and hospitals) cannot be located in areas where the individual risk is above 10^{-6} per year. The level of the societal risk can be acceptable depending on:

- assessment of the area evacuation time and the ability to control the consequences of the ammonia release, and
- analysis of a societal cost benefit of the proposed land use plan

Dr. Menso Molag is a professor in risk management at Saxion University for Applied Science. From 1976-1986 he worked in the department of Environmental Sciences of the University of Groningen. Since 1987 he has worked in the department of Industrial Safety of the TNO. Dr. Molag led numerous project teams on the development and application of probabilistic and deterministic risk assessment models for the transport of persons and dangerous goods, and has been the project manager of TNO's quantitative risk assessment of all activities with hazardous materials in the Haifa Bay area. He also coordinated the EC thematic network on tunnel safety, SafeT. In the last years he has studied ways to protect road and rail tanks by an insulating heat resistant coating, to avoid a BLEVE when the tank is engulfed in a fire.