

IMPACT OF TRAUMA HELICOPTERS ON AIR QUALITY INSIDE HOSPITALS**J.F.W. Koopmans***Peutz Consulting Engineers, Mook, The Netherlands*

Many modern hospitals utilize trauma helicopters to fly trauma teams to patients in need of urgent medical care. The helicopter deck is often situated on the roof of the hospital, where many of the hospitals air-conditioning vents are also located. As a result, the activities of a trauma helicopter can become a serious threat to the air quality inside the hospital. On many occasions wide spread complaints about unpleasant odors and related health problems manifested themselves throughout the hospital, even from staff in the operating theaters. In order to determine the complex dispersion of air pollution, a scale-model (1:200) of the hospital was built. The dispersion of exhaust fumes was thoroughly researched using tracer gas measurements executed in an atmospheric boundary layer wind tunnel in our laboratory in the Netherlands, in combination with air velocity and concentration measurements on site. Various helicopter activities (take-off and landing, engine idling), different wind conditions (direction and speeds) were simulated and analyzed. Local wind speeds, rotor blades induced air speeds and air pollutant concentrations measured on site, were used to verify results obtained by the scale model in the wind tunnel. For the maximum deployment of the helicopter, pollution levels both outside and inside the hospital were determined. For the latter the ventilation-rate of different rooms plays an important role. Based on the wind tunnel study a plan is made to improve the indoor air quality by means of, for example deflection, use of air filtration or repositioning the air-conditioning vents to clean surroundings.