Numerical Simulation of the Air Pollutants Dispersion Emitted by CPH Using ANSYS CFX

Authors : Oliver Mărunţălu, Gheorghe Lăzăroiu, Elena Elisabeta Manea, Dana Andreya Bondrea, Lăcrămioara Diana Robescu

Abstract : This paper presents the results obtained by numerical simulation of the pollutants dispersion in the atmosphere coming from the evacuation of combustion gases resulting from the fuel combustion used by electric thermal power plant using the software ANSYS CFX-CFD. The model uses the Navier-Stokes equation to simulate the dispersion of pollutants in the atmosphere. We considered as important factors in elaboration of simulation the atmospheric conditions (pressure, temperature, wind speed, wind direction), the exhaust velocity of the combustion gases, chimney height and the obstacles (buildings). Using the air quality monitoring stations we have measured the concentrations of main pollutants (SO_2, NO_x and PM). The pollutants were monitored over a period of 3 months, after that we calculated the average concentration, which is used by the software. The concentrations are: 8.915 µg/m3 (NO_x), 9.587 µg/m3 (SO_2) and 42 µg/m3 (PM). A comparison of test data with simulation results demonstrated that CFX was able to describe the dispersion of the pollutant as well the concentration of this pollutants in the atmosphere.
Keywords : air pollutants, computational fluid dynamics, dispersion, simulation
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