

VALIDATION OF AIR POLLUTION (ISCST3) MODEL UNDER THE METEOROLOGICAL CONDITIONS OF KUWAIT

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Abstract: Air dispersion models provide powerful tools to estimate the impact of nearby pollutant sources, such as tall chimneys in petrochemical refineries and power plants, on their surrounding areas. After calibration and validation of these models under the meteorological conditions of specific areas they can be used as management tools to monitor and control the sources of air pollution. In this paper we investigate and validate a widely used dispersion model called the US-EPA. The model, we focus is on the version 3 of this model specified as Industrial Sources Complex for Short Term prediction (US-EPA, ISCST3) under the meteorological conditions of the state of Kuwait. The model was implemented to examine the effects of sulphur dioxide (SO₂) emissions in the residential areas of Kuwait from the Doha power complex which consists of Eastern and Western power generation plants. The emissions of SO₂ were monitored at Rabia station and were used to validate the model. The results indicate that most of the residential areas of Kuwait are heavily affected by the SO₂ plume emitted from Doha power complex, especially when the wind is from north-west direction. The statistical judgment between the daily model predictions and the measurements at Rabia station for the period of August-September, 2001 (60 day samples) show that the model is capable of generating results with an accuracy of about 90%. An important conclusion derived from this work is that the ISCST3 model can be used to predict the air quality under the meteorological conditions of Kuwait with a high degree of accuracy.