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Core Convergence, Hyundai Steel and Contaminant Diffusion Modeling

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Analyze
 the impact of nearby residents by predicting the atmospheric
 diffusion path



Core Convergence, a company specializing in environmental engineering and engineering, established integrated modeling of the interior of Hyundai Steel and atmospheric diffusion modeling of pollutants such as TSP, SOx, and NOx generated from the internal chimney of the steel mill together with Hyundai Steel, and influences neighboring residents by predicting the atmospheric diffusion path. It is also interesting to conduct an analysis. Photo = Correspondent Choi Ji-heung

Core Convergence, a company specializing in environmental engineering and engineering, together with Hyundai Steel, conducts an analysis of the impact of neighboring residents by predicting the atmospheric diffusion path. In particular, for this analysis, Core Convergence built an integrated modeling of the interior of the Hyundai Steelworks and atmospheric diffusion modeling of pollutants such as TSP, SO_x, and NO_x generated from the internal chimney of the steelworks.

Due to rapid industrialization, the number of densely populated areas of factories is increasing, and the increase in risk factors such as typhoons and earthquakes due to environmental changes is increasing social awareness about the leakage of harmful (toxic) substances. Harmful (toxic) substances have already been exposed to the human body and the environment and have various effects, so concerns about the occurrence of hazardous substances have been constantly raised. In particular, a hazardous substance leak accident causes secondary pollution and has a characteristic that restoration is difficult. If the accident is not controlled in the early stage, it will consume a long time and a lot of economic cost to restore it to its original state as well as a serious accident.

Accordingly, there is a continuous need to analyze the influence of nearby residents through atmospheric diffusion modeling in a densely populated factory area and to prepare countermeasures.

The software applied by Core Convergence in this project is Fluidyn-PANEIA, a sub-module of Fluidyn-PANACHE developed by Fluidyn. Fluidyn-PANEIA is a dedicated tool for planning and evaluating environmental impacts on air quality in industrial areas, and can be applied to atmospheric diffusion modeling of industrial pollutant emissions from points or chimney sources.

The atmospheric diffusion model conducted by Core Convergence uses a computational fluid dynamics program (Fluidyn-PANEIA) that can quantitatively calculate the concentration of discharged pollutants in the atmosphere based on physicochemical theory.

Currently, Gaussian model is the most widely used in environmental impact assessment, etc., but Fluidyn-PANEIA is a 3D numerical model that requires very sophisticated and advanced technology such as Lagrangian and Oilian models, and more accurate results can be seen.

In addition, users can easily model it, and users can easily access it by inputting meteorological data and source data to derive atmospheric diffusion results.

Core Convergence CEO Hyun-doo Ahn said, "In general, atmospheric diffusion models are used for scenario analysis, so they are not suitable for real-time atmospheric diffusion modeling. It is necessary, and Core Convergence builds Fluidyn-REALTIME for this, and can maximize the effect of the control system by checking the degree of diffusion of substances and dangerous parts based on real-time monitoring and predictive models."

In addition, "Through long know-how and technological competitiveness, Core Convergence uses Fluidyn-REALTIME to not only predict the spread of hazardous substances, but also perform backtracking simulations to identify the source of hazardous substances," he said. We hope that it will help to reduce the occurrence and build a system that can respond quickly."

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