

Innovative Simulation Tools for Safe and Efficient Nuclear Energy Supply - Fluidyn at WNE 2025

Our Expertise serving the Nuclear Industry

As the fight against climate change accelerates the transition to a low carbon-society has become essential - and nuclear energy is emerging as a key source of reliable, continuous and clear power.

FLUIDYN empowers the nuclear industry with **advanced 3D CFD numerical solutions** that cover the entire life cycle of facilities — from **safety and ventilation** to **reactor optimization**, **radioactive dispersion**, **waste management**, and **environmental impact reduction**.

By combining **CFD**, **heat** and **multi-physics analysis**, in a single tool, **FLUIDYN** delivers robust, high-value solutions applied to complex industrial and nuclear processes — including vortex-induced vibrations (VIV) in piping systems, heat exchanger and wall cooling in reactors, Tokamak blanket evaluations, hydrogen emission and explosion risk in containment, design optimization of safety devices, etc.

Case Studies for Nuclear Safety and Ventilation

FLUIDYN will showcase some of its nuclear CFD expertise at the CFD4NRS event in Japan, this year, through a presentation, in collaboration with **ORANO**, on the numerical simulation of particle mixing inside a duct—demonstrating how CFD can optimize the placement of representative sampling points for reliable radionuclide measurements in nuclear ventilation systems.

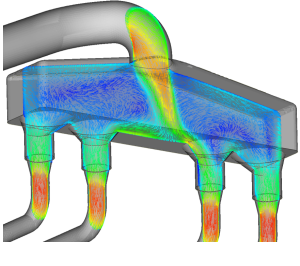
FLUIDYN will also present a second paper, in collaboration with the **SRM Institute of Science and Technology**, Chennai (India), on modeling uncertainty in CFD simulations using interval arithmetic for radon flux prediction. By combining **Fluidyn-MP**, Artificial Neural Networks (ANN), and Particle Swarm Optimization (PSO), the study quantified uncertainty effects and precisely identified parameter bounds for diffusion flux under varying conditions.

At the ROOMVENT Conference 2024 in Stockholm, **FLUIDYN** In collaboration with **ORANO**, France's leading actor in civil nuclear energy, presented case studies on enhancing **safety and user comfort** in laboratory environments through optimized airflow management and improved mixing in ventilation ducts and exhaust systems ensuring accurate radionuclide sampling.

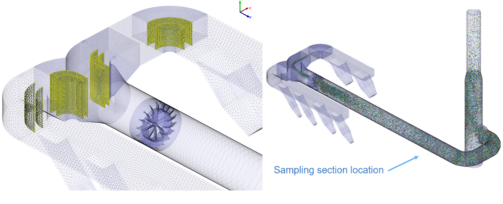
For **BARC**, India's leading nuclear research organization, **FLUIDYN** conducted CFD studies **on hydrogen recombiners**, **radionculide transport**, and **fire door design** for nuclear plants to withstand accidental hazards.

Innovation in Action

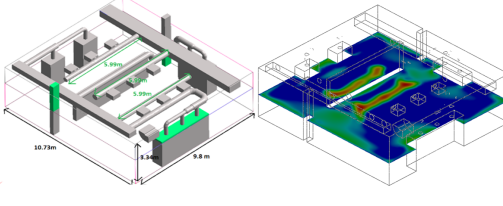
Through continuous innovation and collaboration, **FLUIDYN** delivers solutions that enhance safety, efficiency, and sustainability in nuclear and environmental engineering — shaping a cleaner and safer energy future.



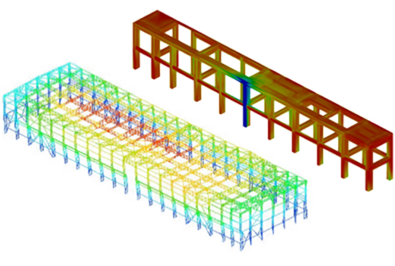
Flow and pressure losses in an injection circuit.



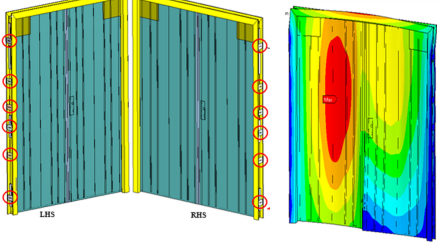
Evaluation of mixing in ventilation ducts.



User comfort optimization in a laboratory



Structural deformation during a fire in closed spaces



Verification of the performance of a fire door

To learn more, visit our booth C001 and discover our innovative solutions for CIVIL NUCLEAR ENERGY !



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