

Simulating nuclear safety

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Commercial operation of the CHASNUPP-1 996 megawatt intermediate type pressurised water reactor began in May 2000 in Pakistan. It is a conventional two-loop PWR and is run by the Pakistan Atomic Energy Commission. Now, scientists Khurram Mehboob and Mohammad Aljohani of the Department of Nuclear Engineering at King Abdul Aziz University in Saudi Arabia have carried out simulations of the activity of

the unit using MATLAB to probe the risks associated with a putative coolant leak that might see radioactivity entering the environment. The team reports details of their study in the *International Journal of Nuclear Energy Science and Technology*.

The researchers point out that as energy demands growing around the world, there is a pressing need to meet this demand and nuclear power or sustainable sources can provide the alternatives that avoid the burning of fossil fuels. However, there are perennial concerns with the operation of [nuclear power stations](#) and the associated risks of radiation leaks that might be caused by human error, systems failure, accident, or even criminal activity.

Mehboob and Aljohani have used a kinetic model in MATLAB to simulate the anticipated amount of radioactivity that might be released from the CHASNUPP-1 [nuclear power](#) plant in the form of contaminated coolant following an accident leading to core damage. The model suggests that leakage would be similar to another reactor, the South Korean KORI-1 reactor, and that the containment would be sufficient to preclude anything but negligible leakage into the outside world. Given the potential global impact of a leak from a [nuclear reactor](#) anywhere in the world, it is important to model worst-case scenarios and to understand the implications for the local and wider environment.

More information: Mohammad S. Aljohani et al. Estimation of radioactivity released from CHASNUPP-1 nuclear power plant during loss of coolant accident, *International Journal of Nuclear Energy Science and Technology* (2018). [DOI: 10.1504/IJNEST.2018.10015404](https://doi.org/10.1504/IJNEST.2018.10015404)

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