Parthkumar Patel

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Dear Prof. ,

I am a PhD scholar working under the guidance of Prof. A. John Arul, Homi Bhabha National Institute (HBNI), Indira Gandhi Centre for Atomic Research, India. I plan to submit my Ph.D. thesis in December, 2022.

I have carried out my Ph.D. in severe accident analysis with prime focus on development of mechanistic modelling of the severe accident source term for sodium cooled fast reactor. We have developed/used both Python and OpenFOAM based tools to analyze in-vessel, interface and in-containment source term. For in-vessel assessment, I have developed two tools namely i) percolation based mechanistic model to determine fission gas release and ii) thermo-chemical equilibrium approach based tool MINICHEM. The model would be not only helpful to determine gap release under accident conditions, but would be helpful to locate failed fuel elements. The developed tool was also used to analyze the allowable failed fuel elements during reactor operation for Prototype Fast Breeder Reactor (PFBR). Apart from these, I have developed python based tool to analyze in-vessel source term which is available as an open source at GitHub.

For the interface and in-containment source term, where the dynamics of aerosol evolution and release are important from the point of source term analysis. We have developed python based tool which is having capability to analyze the aerosol evolution with time. The model is available as an open source at GitHub. Further, by utilizing the capability of OpenFOAM, we have performed 3D simulations for the cover gas and containment facilisis (scaled experimental facilities) in order to have realistic feedback of aerosol evolution during accident conditions.

I am extremely eager to pursue a post-doctoral research on any challenging problems in the field of multiphysics simulation of future generation reactors and related research topics. My formal training, academic background and research experience should perimt me to carry on my work in any research problem related to fission gas release, coupled neutronic-thermal hydraulics problems and aerosol related problems. My field of research interests matches with the work carried out in your research group on [   ]. I would like to work on research problems related to the [   ]. As an aspiring researcher I ensure that I will give my best to create and innovate in the field of [   ] and work hard in order to probe my self worthy.

I will be happy to provide you with any additional information that is necessary to support my application. Looking forward to hearing from you.

Sincerely,

Parthkumar Rajendrabhai Patel