

Dr. S. Shoaib Raza
(Curriculum Vitae)

Syed Shoaib Raza, DCE/DNE

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Academic Qualifications:

1. **B. Sc.** Civil Engineering, University of Engineering & Technology, Lahore (1980-1985).
2. **M.Sc.** Nuclear Engineering, Quaid-i-Azam University, Islamabad (1986-1988).
3. **Ph.D** (Engineering), National Autonomous University of Mexico (UNAM), Mexico (1998-2001), Thesis title "Numerical Simulation of the Transport and Dispersion of a Radionuclide Plume in the Atmosphere".
4. Three weeks course on "Micrometeorology", held at Metropolitan Autonomous University (UAM), Mexico.
5. Certificate Course: SPANISH language for foreigners, CEPE-UNAM, Mexico (1997-98).

Positions held:

1. Assistant Engineer (1988-1991), Nuclear Engineering Division, Pakistan Institute of Nuclear Science and Technology (PINSTECH), Nilore, Islamabad.
2. Senior Engineer (1991-1999), Nuclear Engineering Division, Pakistan Institute of Nuclear Science and Technology (PINSTECH), Nilore, Islamabad.
3. Principal Engineer (1999-2008), Nuclear Engineering Division, Pakistan Institute of Nuclear Science and Technology (PINSTECH), Nilore, Islamabad.
4. Head Coordination; Head Environment Section at GCISC, Islamabad (2005-2007), on secondment from PINSTECH, Islamabad.
5. Deputy Chief Engineer/Associate Professor (2008 to date), Department of Nuclear Engineering (DNE), Pakistan Institute of Engineering & Applied Science (PIEAS), Nilore, Islamabad.
6. Post-doc Researcher - CNRS (Nov. 2009 to Nov. 2010), Laboratory Image, Ville, Environment (LIVE), Faculty of Geography, University of Strasbourg, France.

Research/Teaching Interests:

1. Modeling of atmospheric transport and dispersion, deposition, decay processes for accidental airborne releases of pollutants using Eulerian/Gaussian and Lagrangian approaches. Numerical simulation of the atmospheric dynamics and turbulent properties for plume dispersion applications.

2. Integrated research & development in the area of environmental impact assessment. Use of computational models such as: RAINS/GAINS-ASIA developed by IIASA, Austria. Use of meteorological prediction models such as MM5, RAMS for coupled use with the plume dispersion and environmental impact assessment models.
3. Reactor physics and safety related calculations for nuclear research and power reactors: team member of the core conversion and power up-gradation project of Pakistan Research Reactor (PARR-1) at PINSTECH, Nilore, Islamabad. Radiological dose calculations for routine/accidental releases from nuclear reactors.
4. Teaching at PIEAS as faculty member of the Departments of Nuclear Engineering (DNE) and as adjunct faculty of Department of Chemical & Materials Engineering (DCME), PIEAS.

Publications:

Technical Reports

1. **S. Raza**, T. Hayat, Neutronic Analysis for the Ford Nuclear Reactor, PINSTECH/ NED-135, 1989.
2. **S. Raza**, A. Salahuddin, Reactor Shielding Calculations for PARR-1, PINSTECH-116, 1990.
3. **S. Raza**, A. Salahuddin, K.M. Akhtar, System Response to a Large Break LOCA in PARR-1, PINSTECH-118, 1991.
4. L.A. Khan, **S. Raza**, Radiological Consequence Analysis of LEU Core for PARR-1, PINSTECH-120, 1991.
5. L. A. Khan, **S. Raza**, Radiological Consequence Analysis for Upgradation of PARR-1 from 9 to 10 MW, PINSTECH-134, 1993.
6. L. A. Khan, I. H. Bukhari, **S. Raza**, Transient Analysis for Upgradation of PARR-1 from 9 to 10 MW, PINSTECH-149, 1994.
7. **S. Raza**, RadCon: A Computer Software for Radiological Consequence Analysis, NED-406, 1994.
8. **S. Raza**, Sabiha Bakhtyar, Asif Salahuddin, Excess Reactivity and Shutdown Margin for PARR-1 LEU Core, NED-603, 1996.

Research Papers

1. S. Manzoor, H.A. Khan, **R. Shoaib**, et al., Some Track Registration Characteristics of CR-39 Detectors Fabricated under various Curing Conditions, **Nuclear Tracks and Radiation Measurements**, pp. 207-210, Vol. **15** (1-4), 1988.
2. L.A. Khan, **S. Raza**, N. Ahmad, A Comparative Study of the Safety Related Parameters and Their Effects on Transient Response of HEU and LEU Fueled Research Reactors, **Turkish J. of Atomic Energy Authority**, pp. 15-35, Vol. **22**, 1995
3. S.A. Khan, **S.S Raza**, Steady State Thermal Hydraulic Analysis Using Computer Code Cobra-3C/RERTR for Low Power Research Reactors, **Turkish J. of Atomic Energy Authority**, pp. 5-22, Vol. **23** (1), 1996
4. **S. Shoaib Raza**, A. Salahuddin, Calculation of the Core Melt Fraction Following a Large Break LOCA in Swimming Pool Type Research Reactors, **Nuclear Science Journal**, pp. 265-270, Vol. **34** (4), 1997
5. **S. Raza**, R. Avila, "Numerical Simulation of the Radionuclide Transport and Diffusion in the Atmosphere (A Lagrangian Approach)", "**Mexico Nuclear**" pp. 62-69, Vol. **1** (2), 2000.

6. **S. Raza**, R. Avila, J. Cervantes, "A 3-D Lagrangian Stochastic Model for the Meso-Scale Atmospheric Dispersion Applications," *Nuclear Engineering and Design*, Vol. **208** (1), 2001, pp. 15-28.
7. **S. Raza**, R. Avila, Jaime Cervantes, A Lagrangian Method for Direct Plume Gamma Dose Calculations, *Nuclear Science and Technology*, Vol. **38** (4), 2001, pp. 254-260.
8. **S. Raza**, R. Avila, A 3-D Lagrangian Particle Model for Direct Plume Gamma Dose Rate Calculations, *Journal of Radiological Protection*, Vol. **21** (2), 2001, p. 145-154.
9. **S. Raza**, R. Avila, A 3-D Lagrangian Particle Model for the Atmospheric Dispersion of Toxic Pollutants, *International J. of Energy Research*, Vol. **26** (1), 2002, pp. 93-104.
10. **S. Raza**, R. Avila, A Comparison of Direct Gamma Dose Rates from a Stationary Gaussian Plume, using Different Models (a technical note), *Nuclear Technology*, pp. 211-216, Vol. **138**, 2002.
11. **S. Shoaib Raza**, "Atmospheric Dispersion Modelling", *Science Vision (PK)*, Vol. 8(2), pp. 130-136, 2002.
12. **S. Raza**, M. Iqbal, A. Salahuddin, R. Avila, S. Pervez, Time Integrated Thyroid Dose for Accidental Releases from Pakistan Research Reactor-1, *J. Radiol. Prot.*, Vol. 24(3), pp. 307-314, 2004.
13. S. Bakhtyar, **S. Raza**, M. Tayyab, S. Pervez, A. Salahuddin, Radiological Impact of PARR-1 Operation on the Environment, *Key Engineering Materials*, Vol. 277-279, pp. 631-636, 2005.
14. **S. Raza**, R. Avila, Calculation of Immersion Doses from External Exposure to Radionuclide Plume, *Health Physics*, 89 (3), pp. 247-254, 2005.
15. **S. Shoaib Raza**, M. Iqbal, Atmospheric Dispersion Modeling for an Accidental Release from the Pakistan Research Reactor-1 (PARR-1), *Annals of Nuclear Energy*, 32, pp. 1157-1166, 2005.
16. Avila R., **Raza S.S.**, Dispersion of Particles Released into a Neutral Planetary Boundary Layer Using a Markov Chain-Monte Carlo Model, *J. Applied Meteorology*, Vol. 44 (7), pp. 1106-1115, 2005.
17. A. Basit, **S. Raza**, N. Irfan, Dispersion of radionuclides released into a stable PBL using a Monte Carlo model, *J. Radiol. Prot.*, 26, pp.375-387, 2006.
18. A. Basit, F. Espinosa, R. Avila, **S. Raza** and N. Irfan, 2008, Simulation of Radionuclides Dispersion in the Atmosphere using an Eulerian-Lagrangian Modeling System, *J. Radiol. Prot.*, 28(4), pp. 539-561, 2008
19. Muhammad Ashraf, R. Avila and **S. S. Raza**, 2009, Transformation of dimensionless heat transfer equation for the solution of dynamic domain in phase change problems, *Journal of The Korean Society for Industrial and Applied Mathematics (KSIAM)*, 13(1), pp. 31-40.
20. **S. Raza** and R. Avila, 2009, Numerical Simulation of Particle Trajectory and Atmospheric Dispersion of Airborne Releases, *Meteorological Application (UK)*, 16 (3), pp. 267-273.

Conference Proceedings

1. **S. Raza**, R. Avila, Numerical Simulation of the Radionuclide Transport and Diffusion in the Atmosphere (A Lagrangian Approach), *International Joint Meeting of the Mexican Nuclear Society and the Latin-American Section of the American Nuclear Society*, Acapulco, Mexico, 18-21 July, 1999, pp. 49-56.
2. R. Avila, **S. Raza**, Dispersion of Particles Released into a Neutral Planetary Boundary Layer: A Comparative Study Between Three Stochastic, Discontinuous Trajectory Models, *Mini-Symposium: Turbulence as a Dynamical System, 52nd Annual Meeting of the American Physical Society, Division of Fluid Dynamics*, New Orleans, USA, Nov. 21-23, 1999.

3. **S. Raza**, R. Avila, A. Quintanar, Transport and Dispersion of Particles in a Coastal Environment, Compilation of abstracts for the *First MIT conference on computational fluid and solid mechanics*, Cambridge, MA., 12-15 June, 2001, p. 118.
4. R. Avila, **S. Raza**, Dispersion and Concentration of Lagrangian Particles in a Neutral Atmosphere, Using a Markov Chain-Monte Carlo Model, *First MIT conference on computational fluid and solid mechanics*, Cambridge, MA., 12-15 June, 2001, pp. 1065-1067.
5. **S. Raza**, R. Avila, Numerical Simulation of the Radionuclide Transport and Diffusion in the Atmosphere (A Lagrangian Approach), *XLIV National Conference of the Physics Society of Mexico*, Morelia, Mexico, 15-19 Oct., 2001.
6. **S. Shoaib Raza**, On the Importance of Modelling in Air Pollution Dispersion Studies, *Third International Science Conference*, University of Arid Agriculture, Rawalpindi, Pakistan, 26-28 Sep., 2002, p. 36.
7. R. Avila and **S. S. Raza**, Dispersion of Particles Released into a Neutral Planetary Boundary Layer Using a Markov Chain-Monte Carlo Model, Proceedings of the *Second International Bhurban Conference on Applied Sciences & Technology*, Bhurban, Pakistan, June 16-21, 2003, pp. 681-694.
8. S. Bakhtyar, **S. S. Raza**, M. Tayyab, S. Pervez, A. Salahuddin, Radiological Impact of Research Reactor Operation on the Environment, Proceeding of the International World women conference on BIEN Technology, Nov. 13-16, 2003, Pai Chai University, Daejon, Korea.
9. Abdul Basit Jilani, S. Shoaib Raza, N. Irfan, Atmospheric Dispersion Modelling for Environmental Impact Assessment using Gaussian And Lagrangian Approach, International Conference on Environmental Horizon, Dec. 19-21, 2005, Karachi.
10. S. Shoaib Raza, Abdul Basit, Niaz Ahmad and Muhammad Munir Sheikh, Simulation of Monsoon Precipitation over Pakistan Region using RegCM-3, Scientific Assembly of the International Association of Meteorology and Atmospheric Sciences (IAMAS 2005) August 2-11, 2005, Beijing, China.
11. A. Basit, S. Raza and N. Irfan, 2007: Simulation of Monsoon Precipitation over South Asia using RegCM3, *12th AMS Conference on Mesoscale Processes*, American Meteorological Society, Waterville Valley, New Hampshire (NH), USA, 6-9 August 2007.

Courses Taught/Invited Lectures

1. “Radiological Engineering”, one semester course to the post graduate students of DNE, PIEAS.
2. “Meteorology and Plume Dispersion”, one semester course to the post graduate students of PIEAS, jointly with Dr. Naseem Irfan and Mr. Asim Ebrahim, PIEAS, 2007.
3. “Special Topics in Environmental Engineering”, one semester course to the post graduate students of PIEAS, jointly with Dr. Naseem Irfan and Dr. M. Mansha Chaudhary, PIEAS, 2006.
4. One week intensive course on “Atmospheric Particle Dispersion Modeling”, jointly with Dr. Ruben Avila of Mexico, PIEAS, Islamabad (June, 2004).
5. Atmospheric Dispersion of a Radionuclide Plume: Lagrangian vs Gaussian Approach, INUP Forum, Islamabad, 20-8-03
5. Two weeks duration intensive course on “Atmospheric Turbulence Modeling”, for Scientists/Engineers, PIEAS, August 5-16, 2002.
6. An invited lecture on “Atmospheric Dispersion Modeling” in the First Introductory Workshop on Mathematical Modeling, GCISC, Islamabad, 29-10-02 to 2-11-02.

Post-Graduate Research Thesis (Supervised/Co-supervised)

1. Muhammad Ashraf, "A Study of Shear-Layer Flow Regimes and Reattachments Lengths Downstream of an Abrupt Circular Channel Expansion", M. Phil. Thesis, CASPAM, BZU, Multan, (Sep. 2004).
2. Zeeshan Ahmed, "Atmospheric Effluent Dispersion for a PWR", PIEAS MS Thesis, (Aug. 2004).
3. Raheel Adnan, "Lagrangian Approach for the Assessment of Atmospheric Dispersion of Pollutants", PIEAS MS Thesis, (Sept. 2007).
4. Saeed-ur-Rehman, "Development of a Turbulent Flow Model for Industrial Processes", M. Phil. Thesis, Allama Iqbal Open University, Islamabad (2008).