AMIR RAFINAZARI, Ph.D., E.I.T.

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Profile

An accomplished engineer with more than 8 years of experience in the areas of Fire Protection Engineering, Civil and Structural Engineering. Amir has developed an extensive theoretical and practical base of knowledge in the area of code compliance and alternative solutions through post-graduate studies and complementing practical experience. He is looking forward to positively contribute his skills, knowledge, and experience to his future team.

Key Skills

- **Code compliance**: NFPA, OBC, OFC, NBCC, NFC, UL/ULC, IBC, ISO, ASTM, ASCE, FEMA, NEHRP
- **Fire Protection Engineering software**: FDS, PyroSim, FPETOOL, CFAST, CONTAM, HydraCAD
- **Structural design software**: SAP2000, ETABS, Nonlin, SeismoSignal, SAFIR, ANSYS, ABAQUS
- **Other software**: AutoCAD, LabVIEW, Primavera Project Planner, Microsoft Project, MATLAB
- **Technical knowledge**: Computational fluid mechanics (CFD), fire detection and alarm systems, suppression systems and sprinkler design, structural fire resistance design, fire risk and hazard analysis, smoke management in atria and tunnels, occupant response and evacuation, data analysis, project management

Education

- **Ph.D., Fire Protection Engineering** *Jan. 2011 - Aug. 2015*
  Department of Civil and Environmental Engineering**,** Carleton University, Ottawa, Canada
  Thesis: “Investigation of the make-up air effect on atrium smoke conditions”
  Award: SFPE National Capital Region Chapter Scholarship for 2014-2015
- **M.A.Sc, Structural Engineering** *Sep. 2007 - Jan. 2010*
  Department of Civil Engineering, Sharif University of Technology, Iran
  Thesis: “Investigation of the IBC proposed *R* factor for base isolated structures”
- **B.Sc., Law** *Sep. 2007 - Jan. 2010*
  Department of Law, Payame Noor University, Iran (not completed – transferring courses)
- **B.Sc., Civil Engineering** *Sep. 2003 - Feb. 2007*
  Department of Civil Engineering, Islamic Azad University - Central Tehran Branch, Iran

Work Experience

Project Consultant *Apr. 2017 – Present*

JENSEN HUGHES CONSULTING, Toronto, Canada

- Provided code consulting in the field of Fire Protection Engineering with respect to the Canadian Building Code and Fire Code. Prepared technical reports and alternative solutions for special cases, such as water curtain sprinkler system, standpipe system, hydrant coverage, fire wrap, combustible piping, discontinuity in fire separations, time based egress analysis with CFD modeling using FDS and zone modeling using FPETOOL and CFAST. Calculated special separation and exposure protection. provided fire code consulting and prepared a report for industrial buildings such as electronic recycling facility and commercial cooking using Ontario Fire Code and NFPA codes and standards (NFPA 68, NFPA 30, NFPA 69, NFPA 497, NFPA 499, NFPA 654 and NFPA 96).

Technical Consultant *Sep. 2016 – Mar. 2017*

LRI Engineering, Toronto, Canada

- Provided code consulting in the field of fire protection engineering and proposed alternative solutions for special cases. Reviewed building drawings based on part 3 of Ontario Building Code (OBC), ABC, NBCC and OFC and NFC, prepared technical reports and provided consultation to clients, governmental officials and municipalities. These projects included new and existing buildings with different types of occupancies such as assembly occupancies, residential, care/care and treatment, mercantile and industrial occupancies in several provinces in Canada. The code consulting included services on building classification, fire separation, occupants evacuation, exit analysis, travel distance, barrier free design and etc. for combustible and non-combustible constructions.

Proposed alternative solutions and new approaches for the buildings that did not meet the requirements of building code classification.

- Advised clients about interpretation of building code articles, identified relevant issues and recommended applicable approaches using NFPA standards (NFPA 130, NFPA 502, NFPA 101 and NFPA 220) for designing an unenclosed open-air station (train shed) for non-electric trains.
- Conducted fire risk analysis by developing event tree for several fire scenarios and calculated the probability using computer models.
- Assisted in designing suppression system for Air Canada hangers in Toronto Pearson International Airport based on NFPA 409.
- Attended to technical meetings and recommended solutions to working groups to meet the public safety requirements.

Fire Protection Consultant *Jun. 2016 – Sep. 2016*

Mirenda Inc., Aurora, Canada

- Managed a group of fire safety technicians and successfully designed sprinkler systems for residential condominiums and manufacturing facilities based on NFPA 13, performed hydraulic calculations and prepared drawings using HydraCAD/HydraCalcs software.

Postdoctoral Fellow in Fire Protection Engineering *Sept. 2015 – April 2016*

Carleton University, Ottawa, Canada

- Worked with other professional engineers and researchers on 3 different research and consulting projects in the field of fire safety engineering.
- Efficiently designed tunnel ventilation system and simulated a train fire in a tunnel using FDS (PyroSim). The effect of air velocity on fire development, critical velocity and backlayering of smoke in the tunnel was investigated based on NFPA 130 requirements. The cone calorimeter test data was used to simulate the material properties. This project resulted in a technical paper presented in ISTSS 2016 conference as a keynote paper.
- Performed CFD modeling using FDS (PyroSim) to assess the fire safety of subway train cars based on Korean fire risk assessment manual for railcars. The cone calorimeter data for the subway car materials was used in the FDS model. Prepared a technical report with 3 other professional engineers for client as a part of a project from Korea Railroad Research Institute.
- Developed and presented technical presentations to researchers, clients, inspectors and industry professionals.
- Taught Fire Dynamics II, Enclosure Fire Dynamics, as a graduate course in winter semester 2016.

Research Assistant in Fire Protection Engineering *Jan. 2011 - Aug. 2015*

Carleton University, Ottawa, Canada

- Successfully conducted full-scale tests and CFD modelling of atrium fire to investigate the effect of make-up air on smoke layer height compared to NFPA 92B requirements. This research resulted in proposing a new design correlation for the effect of make-up air on the smoke layer height.
- Responsible for design of fire tests including selection of measurement and instrumentation, production of instruments drawings in AutoCAD, programming of data acquisition systems using LABView, and data analysis.
- Designed pressurization systems for high rise buildings and performed smoke control rational analysis using CONTAM.
- Reviewed design of an 8-storey wood building (cold and fire design), estimated fire resistance rate of structural members based on CWC code.
- Developed event tree for different fire scenarios to estimate the risk.
- Detailed calculation of fire resistance rate of CLT wall and floor assembly using MATLAB and Excel.
- Simulated compartment fires using FDS (PyroSim) and CFAST. This work resulted in a technical paper presented in International Conference on Fire Computer Modeling, GIDAI-Fire Safety- Research and Technology, University of Cantabria, 2012.

Structural Engineer *Jan. 2007 - Nov. 2010*

Pahne Gostar Dejboran Aram Co., Tehran, Iran

- Analyzed and designed earthquake resistant structures (concrete and steel) using SAP2000 and ETABS.
- Performed on-site field inspections of 2 high rise concrete and steel buildings for code and engineering design compliance.

- Assisted with preparation and coordination of overall work plans and schedules, executing construction activities including supervision of crews and equipment to ensure that projects were completed in a timely and cost effective manner.

Research Assistant in Structural Engineering *Sept. 2007 - Jan. 2010*

Sharif University of Technology, Tehran, Iran

- The ASCE proposed response modification factor for base isolated structures was studied by performing extensive nonlinear dynamic analysis of 3-D structural models designed with different *R* factors and different eccentricities under several earthquake excitations using SAP2000. This research resulted in proposing an increase in *R* factor limit for seismic design of base isolated structures.
- Conducted stress and strain analysis of a beam with a hole using Finite Element Method by programing in MATLAB.
- Researched on the seismic rehabilitation of the base isolated structures using FEMA 356.

Project Engineer (Internship) *Jan. 2006 - Dec. 2006*

Pahne Gostar Dejboran Aram Co., Tehran, Iran

Effectively scheduled and tracked progress of projects and quality of work to ensure work was completed as per drawings and standards using Microsoft Project. Processed and reviewed all shop drawings, site instructions and technical inspections.

Publication

Fire Technology journal

- A study of the Effect of Make-Up Air Velocity on the Smoke Layer Height with Symmetric Openings in Atrium Fires

SFPE Conference, Montreal, Canada October 2017

- Impact of Make-Up Air Velocity on the Effectiveness of Smoke Management Systems in Atria

Fire Science and Technology journal

- Full-Scale Tests and CFD Modeling to Investigate the Effect of Opening Arrangement on Smoke Layer Height in Atrium Fires

14th International Conference and Exhibition on Fire Science and Engineering (Interflam 2016), Windsor, UK, July 2016

- Full-Scale Tests to Evaluate the Make-up Air Velocity on the Atrium Smoke Conditions

The 7th International Symposium on Tunnel Safety and Security (ISTSS 2016), Montreal, Canada, March 2016

- Fire Development and Spread in Rail Tunnels (paper accepted)

NFPA 2015 Conference and Expo, Chicago, June 2015.

- Make-up Air Effects on Smoke Interface Height - Full-Scale Tests and CFD Modeling (poster)

IFireSS 2015, University of Coimbra, Portugal, April 2015

- Full-scale Tests and CFD Modelling to Investigate the Effect of Different Make-up Air Velocities on Smoke Layer Height in 1 MW Atrium Fire

11th International Symposium on Fire Safety Science, International Association for Fire Safety Science (IAFSS), University of Canterbury, Feb. 2014

- Investigation of Make-up Air Velocity effect on Smoke Layer Height in Atrium Fires (poster)

International Conference on Fire Computer Modeling, GIDAI-Fire Safety- Research and Technology, University of Cantabria, 2012

- Full Scale Tests and CFD Modeling of a Compartment Fire in an Atrium with Smoke Exhaust

Professional Membership

EIT (passed Ethic & Law exam, pending P.Eng. application), Member of SFPE-SOC, IAFSS, CSCE, OSPE, (P.Eng.) Iran

Awards and Prizes

SFPE National Capital Region Chapter Scholarship for 2014-2015.