Armin Wolski, M.Sc., PE

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Professional Profile

Armin Wolski is a fire protection engineer and fire-life safety building code consultant with more than 25 years experience in the building design and construction industry. He is an internationally recognized expert on prescriptive and performance building codes and standards including: the International Codes (International Building Code/International Fire Code), National Fire Protection Association, UL Standards, FM-Global, and ASTM Standards. Holding a M.Sc. degree from Worcester Polytechnic Institute and a B.Sc. Degree from U.C. Berkeley, he has published extensively on the subject of acceptable risk and fire safety regulations.

Armin is regularly appointed to regulatory and standards making organizations to assist in the development of codes and standards, including the International Code Council (ICC), the National Fire Protection Association, the State of California and the City of San Francisco. He was appointed to the ICC Means of Egress Committee three times for the development of the 2015 and 2018 and the 2021 International Building Codes.

His experience in supporting the design and construction of buildings spans a variety of types: high-rise office, multi-family residential, resort casinos, health care, multi-modal transportation, and museums. Armin was the lead fire safety code and smoke control consultant on the first LEED platinum museum and first LEED platinum high-rise office building in California. His consulting activities have a global reach, having worked on projects in South America, Europe, and Asia. He is a contributing author of the SFPE *Guide for Fire Safety Design of Tall Buildings,* and co-author of the chapter *Fire Risk in Mass Transportation* in the SFPE Handbook of Fire Protection Engineering and *Fire Safety Challenges of Tall Wood Buildings,* NFPA Research Foundation.

During his career, Armin has also been involved with fire testing and commissioning of a variety of building fire safety and fire protection systems, including fire sprinkler, smoke control, and fire alarm systems. Armin is experienced with using computer fire and egress modeling and understands the role of such quantitative tools in both prescriptive and performance-based codes and standards. He recognized by the City of San Francisco and the California State Fire Marshal's office as a qualified smoke control system peer reviewer.

Armin is a recognized Fulbright Specialist and two-time grant recipient. In 2012, he was appointed as a visiting lecturer at Universidad Pontificia de Comillas, Madrid, Spain and in 2014 in Seoul, Korea as a touring lecturer, on the subjects of Performance-Based Design, High Rise Fire Safety, Smoke Control and the International Building Code. He is often invited as a guest lecturer on fire safety topics at Cal Poly, San Luis Obispo, and the California Academy of Arts.

Education

MSc – Fire Protection Engineering, Worcester Polytechnic Institute, 1999
- Thesis topic: Acceptable Risk and Building Code Development

BS – Civil Engineering, University of California, Berkeley, 1989

Professional Licensure and Certification

Licensed Professional Engineer, State of California,
Licensed Professional Engineer, State of Nevada,
Licensed Professional Engineer, State of Washington
Licensed Professional Engineer, State of Oregon
Licensed Professional Engineer, State of Texas

Representative Project List

San Francisco Conservatory of Music

The new San Francisco Conservatory of Music building is a high-rise residential, educational and performing arts building. Armin provided both fire life safety and smoke control design consulting services for this 12-story structure. The challenges included the mixture of assembly and residential occupancies, unique interior finish, and egress from the performing arts (assembly) venue at the uppermost levels of the building. Construction 2019-2021.

415 Natoma Street

The 415 Natoma Street project is part of the H1 development in the middle of San Francisco. The project is a high-rise office more than 300 feet in height with adjacent existing buildings. The fire safety codes normally require facades close to property lines to be fire resistive; however, with a performance-based approach to protecting the facades, the building was permitted to have sprinkler protected glass on key elevations in lieu of 1-hour fire resistive walls. Armin provided both fire life safety code as well as smoke control and fire service access elevator consulting. Construction 2019-2021.

Precision Cancer Medicine Building, San Francisco, California

The UCSF Precisions Cancer Medicine Building was built as an addition to the adjacent UCSF Ron Conway Family Gateway Medical Office Building. As a high rise, it was required to meet smoke control, fire alarm and fire service access elevator requirements. As a medical facility, it needed to also comply with NFPA 101. Armin assisted the Stantec Integrated Project Delivery team in meeting all the requirements without impacting the design. As part of this process he developed a passive smoke control approach to reduce complications. Finished construction 2019.

California Academy of Sciences, San Francisco, California

Fire Safety Project Director responsible for developing fire safety design for a five story, 37,000 square meter natural history museum and research facility. Coordinated compliance with building and fire codes with the architects, engineers and contractors. Directed full-scale fire testing for the protection of the research collections to meet the intent of NFPA 30, *Flammable and Combustible Liquids Code*. The collection consists of more than a million specimen preserved in ethanol in glass containers, stored in compactor shelving. Finished construction 2008.

UCSF Mission Bay Medical Center

Armin Wolski acted as fire safety design director through construction documents and permitting phases. The high rise, million square foot plus UCSF Mission Bay Medical Center includes the

Benioff Children's Hospital and the Ron Conway Family Medical Office Building. The challenges included fire life safety review and approval by different two state agencies, smoke control and stair pressurization systems, extraordinarily large floor plates sectioned off with strategic placement of smoke barriers, and fire separations of different occupancies. Opened 2015.

Salesforce Tower, Tenant Improvements, Ohana Levels 60-61, 301 Mission Street, San Francisco, California

Armin was fire life safety code consultant and smoke control design consultant for the tenant improvement for Salesforce of the two top floors of this new (2016) high-rise building. Challenges overcome included addressing changes of occupancies from Group B to Group A, re-calculating the egress needs and helping Mark Cavagnero Architects establish appropriate occupant loads and uses for the spaces. This avoided the need for unsightly and awkward horizontal exit walls dividing the two stories. In addition, a new open stairway was introduced, interconnected the stories. Negotiations with the building and fire department were key factors in the success of the project. The project also required a recalculation of the smoke control system and the development of an amendment to the smoke control system report for the building.

Salesforce East Tower Tenant Improvements Ohana Levels 27-30 (350 Mission Street), San Francisco, California

Armin was fire life safety and smoke control design consultant for the tenant improvement for Salesforce of the four top floors of this new (2016) high-rise building. Challenges overcome included addressing changes of occupancies from Group B to Group A, re-calculating the egress needs and helping Mark Cavagnero Architects establish appropriate occupant loads and uses for the spaces. This avoided the need for additional exits for these stories. In addition, a new open stairway was introduced, interconnected all the stories. This required a recalculation of the smoke control system and the development of an amendment to the smoke control system report for the building.

Seattle Library Atrium Smoke Control, (High-Rise), Seattle, Washington

Performance based analysis and specification of new high-rise library atrium smoke control system. Assisted architect and mechanical engineer with a number of smoke control challenges. With the analysis it was shown that the code prescribed 350 cm/s could be reduced to approximately 125 cm/s. Opened 2004.

Museum of Flight, Tukwila, Washington

Assisted design team in developing code conforming plans for the new Museum of Flight in Tukwila, Washington. Worked directly with NBBJ architects in resolving numerous challenges. Among the challenges, proper sprinkler system design requirements, issues with an adjacent existing historic building, and the use of a fire wall specially protected with an automatic fire sprinkler system. Opened 2004.

Venetian Sands Macau, (High-Rise), Cotai. China, SAR

Provided IBC and NFPA code and standards consultation and assisted in preparation of a fire strategy report to address significant portions of a new 10 million square foot resort high-rise casino facility. Prepared alternate methods of code compliance supported by performance-based design tools. Opened 2007.

Intercontinental Hotel (High-Rise), Mendoza, Argentina

Assessed a high-rise hotel under construction for compliance with international standards and the Intercontinental Hotel Group Fire Safety Guidelines. Major design defect was the sole exit stair provided for one of the towers. Although under construction, was tasked to identify a cost effective, practical and economical solution to address IHG's safety concerns.

San Francisco Trans-bay Terminal, San Francisco, California
The terminal, a three-city block long, 6-story, above ground and underground, elevated multi-modal bus and underground train station for California High Speed Rail. Acted as prime fire life safety code consultant which included risk and vulnerability analysis, development of performance-based fire safety egress design, structural fire engineering and both natural and active smoke control system design. Opened 2018.

Kaiser Hospitals, California
Provided building fire safety code consulting services for the design of new hospitals throughout California: Kaiser Santa Clara, Kaiser Modesto, Kaiser Sand Canyon. Key issues involved developing or resolving egress design issues with the architect, stair pressurization smoke control, and developing fire life safety strategies so the designs can meet the requirements of the *California Building Code* and NFPA 101*, Life Safety Code.*

Hard Rock Hotel Resort Casino Expansion (High-Rise), Las Vegas, Nevada.
Fire life safety director of the 35,000 square meter expansion of an existing high-rise hotel casino resort. The project included two new high-rise towers with smoke control, new convention center as well as a new live theater venue. Existing smoke control and fire alarm systems required integration with the proposed expansion in a way such that phasing could be accomplished without business interruptions. Expansion opened 2010.

Mandalay Bay Convention Center, (High-Rise Addition), Las Vegas, Nevada
The analysis of a unique egress design system for the convention center halls. Performance based design resulting in the permission of extending the exit travel distances in excess of prescriptive standards. The extension permitted larger halls and greater flexibility of the spaces. Expansion opened 2003.

San Jose State Student Union Expansion/Atrium
Reax provided assistance in the development of an atrium smoke control system during the renovation of a major building on campus. The renovation included the introduction of a new atrium, which required smoke control. Reax supplied the necessary expertise and analysis in providing the appropriate smoke exhaust and make up air supply for safe design. Armin was involved in peer review of the project and negotiations with the State Fire Marshal on related issues. Opened 2015.

Bay Area Rapid Transit (BART), San Francisco Bay Area, California
Project Fire Engineer for the design of seven stations that form the extension of the current BART network. The work includes the review of architectural designs, development and assistance of egress design calculations and overall coordination of national fire safety standards and code requirements of the *California Building Code*. Also involved with analyzing train station and vehicle safety according to building standards utilizing fire simulation tools to better understand the fire hazard.

UCLA Seismic Retrofit Program Study: Wheeler Hall, Royce Hall, Men's Gym, Clark Library
Project code consultant for the concept and programmatic stage of a proposed seismic retrofit effort of a number of UCLA buildings. Armin's role was to survey the buildings' fire safety systems for compliance with California Building and Fire Codes and prepare a report tailored to each building on the regulatory impact of the retrofit work to each structure. Among the elements studies were egress, fire separations, fire alarm and fire sprinkler systems.

U.C. Berkeley Haas Pavilion: Expansion
The Haas Pavilion was developed from the existing gymnasium building in order to add substantially more seating to an existing stadium for the purposes of obtaining television coverage. As project engineer during the design, Armin provided guidance to Ellerbe Becket Architects in developing code conforming seating, aisle and egress plans. Armin also assisted in designing the Pavilion's new smoke protected assembly seating smoke exhaust system. The system allowed for maximizing the efficiency of the seating bowl, which was key to the expansion.

U.C. Berkeley Martin Luther King Junior Student Union/Eshleman Hall Fire Sprinkler and Fire Alarm Retrofit
Armin was project engineer/owner's representative during the construction phase of the retrofitting of a sprinkler system and fire alarm system in this existing, significant, multi-story, mixed use, campus building. The project required ongoing student union operations, including the Pauley Ballroom. The project also included the retrofitting of a nearby seven-story building (Eshleman Hall) with the same systems, however this latter building was recently demolished.

Los Angeles Federal Courthouse
Provided fire life safety code consulting and atrium smoke control analysis and report to Perkins and Will, Chicago for a high-rise courthouse project in Los Angeles, California. The project included a 100 foot + tall atrium. As fire safety design director for the project, the team employed computational fluid dynamic modeling for the smoke control system and found that less than half the required smoke exhaust and make up air was necessary compared to the prescriptive method. The design was reviewed and accepted by the General Services Administration. (Project was significantly revised based on value engineering in 2006 and the atrium was removed.)

Fana Four (High-Rise), Bellevue, Washington
Under design in 2015-2017, Armin provided smoke control and fire safety code consulting services to the design team for a proposed dual high rise residential and hotel tower. Stair pressurization of 300+ foot tall stairshafts, stack effect, and assembly uses inclusive of a 4th story pool deck were among the key fire safety code challenges. Armin proposed alternative options to the design team to address the challenges, including either additional fire separations or additional smoke control fans. The challenges require significant discussions with the authorities having jurisdiction and finalizing decisions in written, countersigned reports. Services provided through permitting.

Bellevue Elev8 (High-Rise), Bellevue, Washington
Under design in 2015-2017, Armin provided smoke control and fire safety code consulting services to the design team for a proposed 400 foot+ story residential tower. Stair pressurization of 400+ foot tall stairshaft, stack effect, and assembly uses were among the key fire safety code challenges. Armin proposed alternative options to the design team to address the challenges, including either additional fire separations or additional smoke control fans. The challenges

require significant discussions with the authorities having jurisdiction and finalizing decisions in written, countersigned reports. Services provided through permitting.

Professional Experience

2013 – present **Reax Engineering, Inc.** Berkeley, CA *Principal Fire Protection Engineer/Building Code Consultant*

- Fire protection engineer/building code consultant for Reax Engineering, Inc., providing consulting assistance, advice, analysis and engineering for all things fire safety.
- Building fire safety design lead at Reax including capabilities from fundamentals of combustion and fire growth analysis to fire and smoke spread modeling to building fire safety code development and appropriate application.

2001 – 2013 **Arup,** San Francisco, CA *Associate Principal, Fire Engineering/Building Code Consulting*

- Fire protection engineering and code consulting discipline leader.
- Responsibilities included client care, management of local team, and technical discipline lead for Arup in the Western United States.
- Fire safety code consulting, (IBC/NFPA/SFPE codes, standards and guidelines), directing and reviewing fire protection systems designs, coordination of mechanical, electrical and plumbing designs for code conformance, and existing building site surveys.

1994 – 1999 **Schirmer Engineering Corporation (now Jensen Hughes),** Concord, CA *Fire Protection Engineer/Code Consultant*

- Major projects included high rise residential (condominium and hotels, San Francisco), high rise shopping center (Westfield Mall, San Francisco), and a number of large hotel resorts in Las Vegas, Nevada.

1990 – 1993 **Fire Specialist, Rolf Jensen and Associates (now Jensen Hughes),** Brea, CA *Code Consultant*

- Major projects included March Air Force Base Hospital, Long Beach Naval Hospital, Brentwood VA Hospital, American Airlines Terminal, LAX, retrofit of fire safety systems for 12 air traffic control towers/airports in the United States including American Samoa and the Marshall Islands.

1988 – 1998 **Fire Research Laboratory University of California,** Berkeley, CA Lab Technician

- Worked in the fire research laboratory at the University of California, Berkeley.
- Responsible for setting up and deconstructing experiments and tests including but not limited to room corner fire tests and fire resistance-wall tests.

Selected Publications, Presentations, and Seminars

1. *Acceptable Risk In Performance Based Fire Safety Design Importance of Perception and Communication, 20 years later,* SFPE Performance Based Fire Safety Design and Expo, Auckland, New Zealand, 2020, Society of Fire Protection Engineers, March 2002.
2. *Fire Safety Challenges of Tall Wood Buildings,* NFPA Research Foundation, co-author and project manager, December 2013.
3. *Fire Risk Assessment in Mass Transportation,* (Chapter) Society of Fire Protection Engineers Handbook Fifth Edition, 2015.
4. *Designers, Reviewers, Builders and Owners: We are all Risk Managers, Part 1,* Building Safety Journal, International Code Council, April, 2011.
5. *Designers, Reviewers, Builders and Owners: We are all Risk Managers, Part 2,* Building Safety Journal, International Code Council, May, 2011.
6. *Addressing Building Fire Safety as an Acceptable Risk Problem: A Guide for Developing Performance Based Fire-Safety Regulations,* Worcester Polytechnic Institute Master's Thesis, Worcester MA, 1998.
7. *Seven Criteria for Addressing Acceptable Risk in Building Fire Safety Codes (Presentation* & Paper) SFPE International Conference on Performance Based Fire

Safety Engineering and Design and World Conference of Building Officials, Maui, HI, 1999.

8. *Application of Seven Criteria for Risk Acceptability in Fire Safety Codes,* (Presentation and Paper) SFPE Symposium on Risk in Fire Protection Engineering, Baltimore, MD, 1999.
9. *Accommodating perceptions of risk in performance-based building fire safety code development,* (Peer Reviewed) Fire Safety Journal, v. 34, no. 3, 2000.
10. *Introduction to Computer Fire Modeling,* (Educational Course) Educode, International Conference of Building Officials, Southern Nevada Chapter, 2000.
11. *Introduction to Computer Fire Modeling,* Educode, International Conference of Building Officials, Southern Nevada Chapter, 2000.
12. *The Importance of Risk Perceptions in Building Fire Safety Codes*, Fire Protection Engineering Magazine, Spring, 2001.
13. *The Use of Computational Fluid Dynamics (CFD) for Atrium Smoke Control Design: Two Case Studies,* American Society of Heating, Refrigerating and Air-Conditioning Engineers Annual Conference, California, 2004.
14. *Building Code Alternative Materials, Design and Methods of Construction: Case Studies,* Colorado Chapter International Code Conference Educational Seminar, Denver, CO 2004 and 2005.
15. *Accommodating perceptions of risk in performance-based building fire safety code development,* Interflam 1999, Edinburgh, Scotland (Primary author).
16. *The Use of Computational Fluid Dynamics (CFD) for Atrium Smoke Control Design: Two Case Studies* American Society of Heating, Refrigerating and Air-Conditioning Engineers Annual Conference, Anaheim, CA Winter, 2004.
17. *Alternative Materials, Design and Methods of Construction and Equipment: Case Studies,* (Educational Course) Colorado Chapter International Code Conference Educational Seminar, Denver, CO 2004 and 2005.
18. *Building Code Requirements for Performance Based Designs and Fire Modeling.* American Composites Manufacturers Association Journal (Peer Reviewed), 2006 (Co-authored).
19. *Engineering Best Practices for Hazard Mitigation, a Presentation to the World Bank. April 2007.* (Co-Presenter).
20. *Using Fire Dynamics Simulator for Flame Spread and Fire Growth Modeling,* (Paper and Poster) Interflam 2007, London, 2007 (Co-authored).

Professional Associations and Appointments

- International Code Council, Means of Egress Committee Appointee, *International Building Code 2015, 2018, 2021*
- Fulbright Senior Specialist *(Grantee 2012 and 2014)*
- Member, *Society of Fire Protection Engineers*
- Member, *National Fire Protection Association*
- Member, NFPA *Fire Risk Assessment Committee*
- Member, SFPE *Committee for Development of the Engineering Guide for Fire Risk Assessment*
- Member, SFPE *Committee for development of the Engineering Guide for Fire Safety Design of Tall Buildings*
- California State Building Standards Commissioner *Technical Committee on Building, Fire, and Other,* 2007 - 2019
- City of San Francisco Commissioner *Board of Examiners*
- Member, Salamander Honor Society