



University at Buffalo

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Structural Fire Engineering and the Roadmap to Resiliency

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Abstract

Fire-structure interaction has been the topic of many experimental and analytical researches in recent years. The majority of existing studies on fire performance of buildings have been overwhelmingly focused at the component level (columns, beams, connections, etc.). The design for fire safety has traditionally followed prescriptive approaches at element level, which neglects the interaction between structural members and the realistic behavior of the structural system. Although there has been progress in the field of fire engineering in the United States since the early 2000s; yet, methodologies to perform systematic and integrated building-level structural analyses at elevated temperatures are not available.

Dr. Khorasani's research group at UB is seeking to develop a framework, through experimental, numerical, and risk-based approaches, for increased safety and more economical design of structures and communities under extreme loading and multi-hazard scenarios, especially fire and fire following earthquake. This presentation provides an overview of three on-going projects: (1) hybrid simulation and testing technique in fire engineering, (2) a comparison of performance-based fire design and the U.S. prescriptive guidelines, and (3) post-earthquake fire response in a community context. The first two projects introduce methodologies to verify safety and achieve more economical designs by looking at the behavior of a structural system rather than individual components. The last part of the presentation discusses fire as a secondary event in a cascading multi-hazard scenario, and will investigate post-earthquake response of a community and buildings under fire.

Date: Friday, October 13th, 2017 Time: 11.00 am

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