

**Department of Structural Engineering
University of California, San Diego
SE 290 Seminar**



Professor Gilberto Mosqueda
Structural Engineering
University of California, San Diego

“Seismically Isolated Nuclear Power Plants Subjected to Beyond Design Basis Shaking”

Wednesday, January 9, 2019

1:00 pm - 1:50 pm, Cognitive Science Building, Room 001

<https://structures.ucsd.edu/seminars>

Abstract

Seismic isolation has been proven as an effective strategy to protect critical facilities including Nuclear Power Plants (NPPs) from the damaging effects of horizontal earthquake ground shaking. The increased flexibility and resulting elongation of the natural vibration period of the structure leads to significant reductions in acceleration and forces transmitted to the structure above the isolation level at the expense of large displacements in the isolation system. These large displacements need to be accommodated by the isolation bearings while sustaining the weight of the structure above. Further, the isolated structure requires a large horizontal clearance at the basement level that is often limited by a moat wall that can also function as a hard stop for the isolation system. In the case of beyond design basis earthquake, there is a potential for impact of the isolated structure to the hard stop or failure of the bearings that can be a significant safety concern. Through a combination of numerical and experimental studies, the stability of seismic isolation bearings and the effects of moat wall impact on the response of seismically isolated NPPs is evaluated. Experimental research includes hybrid simulation with testing of full scale seismic isolation bearings under combined three-dimensional seismic loads and shake table testing to evaluate pounding forces. The experimental data is being used to develop models able to capture the behavior of nuclear power plants for beyond design basis shaking.

Biography

Gilberto Mosqueda is a professor in the Department Structural Engineering at the University at California San Diego. He received his Ph.D. from the University of California at Berkeley, M.S. from Massachusetts Institute of Technology, and B.S. from the University of California at Irvine all in civil engineering. He received the NSF CAREER award in 2008 and is currently on the editorial board for the journal Earthquake Spectra. The focus of his research is in the area of structural and earthquake engineering, particularly on understanding and improving the seismic performance of structural and nonstructural systems under seismic loads. Recent research has examined the seismic response of structural systems under extreme loads including the collapse of steel structures and limit states in seismic isolation system using hybrid simulation. He has led and participated in various reconnaissance mission following earthquakes around the world. Most recently he co-led the team organized by the Earthquake Engineering Research Institute to investigate damage from the 2017 Puebla-Morelos Earthquake in Mexico.

*Sponsored by Professor Ken Loh
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