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Vijay K. Saraf, Ph.D., P.E.
Senior Managing Engineer

Professional Profile

Dr. Vijay K. Saraf is a Senior Managing Engineer in Exponent's Buildings and Structures practice. He specializes in structural failure analysis, design, damage assessment and repair design of wood, steel, concrete and composite structures; and blast and impact loading on structures. Dr. Saraf's expertise in structural engineering also extends to structural evaluation of bridges, pipelines and other buried structures, storage tanks and silos, shoring systems, cranes and mechanical equipment, marine structures, and nonlinear and dynamic finite element analysis of structures under extreme loadings such as blast, wind and earthquake. He has performed extensive research focused on reliability-based risk analysis, development of LRFD-based design codes, and nondestructive field evaluation of bridges and other structures.

Prior to joining Exponent, Dr. Saraf held several research positions at the University of Michigan in Ann Arbor, the University of Cincinnati, and the Indian Institute of Technology in Kanpur.

Academic Credentials and Professional Honors

Ph.D., Civil Engineering, University of Michigan, Ann Arbor, 1997
M.S., Civil Engineering, University of Cincinnati, 1994
B.Tech., Civil Engineering, Indian Institute of Technology, Kanpur, India, 1992

Rackham Pre-Doctoral Fellow, University of Michigan, Ann Arbor, 1996–1997

Licenses and Certifications

Registered Professional Civil Engineer, California, #C61004

Publications

"Big Blue Goes Down. The Miller Park Crane Accident," *Engineering Failure Analysis*, Vol. 14, Issue 6, September 2007 (with B. McDonald and B. Ross).

"Big Blue Goes Down: The Miller Park Crane Accident," Proceedings of the 6th International Symposium on Risk, Economy and Safety, Failure Minimization and Analysis, Capetown South Africa, March 8–12, 2004 (with B. Ross and B. McDonald).

"A Spectacular Collapse: The Koror-Babeldaob (Palau) Balanced Cantilever Prestressed Post-Tensioned Bridge," The Indian Construction Journal, Vol. 77, No. 3, March 2003 (with B. McDonald and B. Ross).

"Response of Slab Bridges Before, During, and After Repair," Journal of Bridge Engineering, ASCE, Vol. 7, No. 5, pp. 267–275, September 2002 (with B. Shahrooz, B. Godbole and R. Miller).

"A Spectacular Collapse: The Koror-Babeldaob (Palau) Balanced Cantilever Prestressed Post-Tensioned Bridge," Proceedings, 27th Conference on Our World in Concrete and Structures, Vol. XXI, pp. 57–68, Singapore, August 29–30 2002 (with B. McDonald and B. Ross).

"Bhuj, India Earthquake of January 26, 2001, Reconnaissance Report—Chapter 19: Roads and Bridges," Supplement A to Volume 18, Earthquake Spectra, July 2002.

"Prestressing Wire Failures in Prestressed Concrete Pipeline," Proceedings, Awarie Budowlane, 20th Engineering Conference on Construction Failures, Szczecin-Miedzyzdroje, Poland, May 22–26 2001, (in Polish) (with L. Eiselstein and P. Moncarz).

"Proof Load Testing of Deteriorated Steel Girder Bridges," *Journal of Bridge Engineering*, ASCE, Vol. 3, No. 2, pp. 82–89, May 1998 (with A.S. Nowak).

"Evaluation of Existing RC Slab Bridges," *Journal of Performance of Constructed Facilities*, ASCE, Vol. 12, No. 1, pp. 20–24, February 1998.

"Evaluation of Bridges by Field Testing," 13th U.S.-Japan Bridge Engineering Workshop, Tsukuba, Japan, pp. 305–319, October 1997 (with A.S. Nowak and S. Kim).

"Field Evaluation of a Steel Girder Bridge," Transportation Research Record, No. 1594, pp. 140–146, 1997 (with A.S. Nowak).

"Reliability-Based Criteria for Proof Load Testing of Bridges," Ph.D. Dissertation, Department of Civil and Environmental Engineering, University of Michigan, Ann Arbor, MI, August 1997.

"Diagnostic and Proof Load Testing for Bridge Evaluation," Proceedings, Conference on Structural Faults and Repair, Edinburgh, UK, Vol. 1, pp. 571–580, July 1997 (with S. Kim and A.S. Nowak).

"Field Evaluation of Existing Bridges," Proceedings, US-Canada-Europe Workshop on Bridge Engineering, Zurich, Switzerland, July 1997 (with S. Kim and A.S. Nowak).

"Evaluation of Bridges using Field Testing," Proceedings, International Conference on Rehabilitation and Development of Civil Engineering Infrastructure Systems, Beirut, Lebanon, Vol. 1, pp. 391–402, June 1997 (with S. Kim and A.S. Nowak).

"Verification of Capacity by Proof Loading," Proceedings, IABSE Workshop on Evaluation of Existing Steel and Composite Bridges, Lausanne, Switzerland, Vol. 76, pp. 121–127, March 1997 (with A.S. Nowak).

"Experimental Evaluation of Fundamental Period of R.C. Frame Buildings with Brick Infills," *Journal of Structural Engineering*, Structural Engineering Research Center, India, Vol. 23, No. 4, pp. 189–196, January 1997 (with S.K. Jain and B. Mehrotra).

"Monitoring Truck Loads and Field Testing of Bridges," International Seminar on New Technologies in Bridge Management, Seoul, Korea, pp. 221–248, December 1996 (with A.S. Nowak and S. Kim).

"Proof Load Testing of Highway Bridges," Transportation Research Record, No. 1541, pp. 51-57, 1996 (with A.F. Sokolik and A.S. Nowak).

"Monitoring Truck Loads and Field Testing of Bridges," Proceedings, International Seminar on New Technologies in Bridge Management, Seoul, Korea, pp. 221–248, December 1996 (with A.S. Nowak and S. Kim).

"Proof Load Testing of Michigan's Highway Bridges," Proceedings, Second RILEM International Conference on Diagnosis of Concrete Structures, Strbske Pleso, Slovakia, pp. 370-375, October 1996 (with A.F. Sokolik and A.S. Nowak).

"Reliability Analysis of Plank Decks for Bridges," Proceedings, National Conference on Wooden Transportation Structures, Madison, WI, pp. 225–231, October 1996 (with A.S. Nowak).

"Verification of Load Capacity of an Old Bridge," Proceedings, Third Conference on Nondestructive Evaluation of Civil Structures and Materials, Boulder, CO, September 1996, pp. 431–440 (with A.S. Nowak).

"Proof Load Testing of Bridges," Proceedings, ASCE Seventh Specialty Conference on Probabilistic Mechanics and Structural Reliability, Worcester, MA, pp. 526–529, August 1996 (with A.S. Nowak and R. Till).

"Bridge Evaluation using Proof Load Testing," Recent Advances in Bridge Engineering - Evaluation, Management and Repair, Proceedings, US-Europe Workshop on Bridge Engineering, Barcelona, Spain, pp. 383–403, July 1996 (with A.S. Nowak).

"Nondestructive Testing of Bridges," Proceedings, Fourth National Workshop on Bridge Research in Progress, NCEER, Buffalo, NY, pp. 47–50, June 1996 (with A.S. Nowak and S. Kim).

"Reliability Analysis for Buried Structures," IFIP WG 7.5 Working Conference on Reliability and Optimization of Structural Systems, Boulder, CO, pp. 281–288, April 1996 (with A.S. Nowak and C.-H. Park).

"Target Safety Level for Bridges," Proceedings, ASCE Structures Congress XIV, Chicago, Vol. 2, pp. 696–703, April 1996 (with A.S. Nowak).

"Behavior of Reinforced Concrete Slab Bridges During and After Repair," Transportation Research Record, No. 1442, pp. 128–135, 1995 (with B.M. Shahrooz, R.A. Miller, and B. Godbole).

"Measurement of Effect of Truck Load on Bridges," Proceedings, First Scientific Conference on New Quality of Transportation, University Pardubice, Czech Republic, Vol. III, pp. 211–218, September 1995 (with A.F. Sokolik and A.S. Nowak).

"Effect of Repair on Behavior of Reinforced Concrete Slab Bridges," M.S. Thesis, Department of Civil and Environmental Engineering, University of Cincinnati, Cincinnati, OH, June 1994.

Presentations and Published Abstracts

"Performance of Bridges in Bhuj, India Earthquake of January 26, 2001," India and Nisqually Earthquake Briefings, EERI, San Francisco, CA, April 3, 2001.

"Performance of Bridges in Bhuj, India Earthquake of January 26, 2001," India and Nisqually Earthquake Briefings, EERI, California Institute of Technology, Pasadena, CA, April 4, 2001.

"Performance of Buildings in Bhuj, India Earthquake of January 26, 2001," ASCE Structures Congress and Exposition, Washington D.C., May 21, 2001.

"Case Studies in Failure Analysis," Engineering Seminar Series, Department of Engineering Science and Mechanics, Virginia Tech, Blacksburg, VA, November 7, 2001.

"Load Capacity Evaluation of Highway Bridges," International Seminar on Bridge Engineering and Management in Asian Countries, Jakarta, Indonesia, September 1996 (with A.S. Nowak).

"Proof Load Testing of Steel Girder Bridges," presentation at 1996 meeting of ASCE Committee on Safety of Bridges, ASCE Structures Congress XIV, Chicago, IL, April 1996 (with A.S. Nowak and A.F. Sokolik).

Reports

"Load Testing of Bridges," Research Report UMCEE 96-10 submitted to Michigan Department of Transportation, Lansing, MI, October 1996 (with A.S. Nowak).

"Pre-Test Analysis of New Lothrop Bridge," Research Report UMCEE 96-15 submitted to Carl Walker Inc., Kalamazoo, MI, June 1996 (with A.S. Nowak).

"Reliability Analysis for Selected Bridges (for Euro Code)," Research Report submitted to Highway Agency (UK), London, UK, December 1995 (with A.S. Nowak and C.-H. Park).

"Calibration of Load and Resistance Factors for TTC Structural Design Manual," Research Report submitted to D.S. Lea Associates Ltd., Toronto, Canada, December 1995 (with A.S. Nowak and C.-H. Park).

"Load Distribution for Plank Decks," Research Report UMCE 95-02 submitted to USDA Forest Service, Madison, WI, January 1995 (with A.S. Nowak and S. Kim).

"Truck Loads on Selected Bridges in the Detroit Area," Research Report UMCE 94-34, Department of Civil and Environmental Engineering, University of Michigan, Ann Arbor, Michigan, December 1994 (with A.S. Nowak, S. Kim, J.A. Laman and A.F. Sokolik).

"Strength Continuity of Deteriorated Continuous Slab Bridges," Report No. UC-CII 94/01, Cincinnati Infrastructure Institute, January 1994 (with B.M. Shahrooz and R.A. Miller).

Professional Affiliations

- American Society of Civil Engineers (member)
- American Concrete Institute (member)
- Structural Engineers Association of Northern California (associate member)
- SEAONC Building Code Committee (member)
- ASCE Committee on Safety of Buildings (member)
- ASCE Committee on Safety of Bridges (member)