

# Challenges and Innovations in Civil and Environmental Engineering and Earth Sciences

## Nuclear Power Infrastructure: Research Needs in Civil Engineering

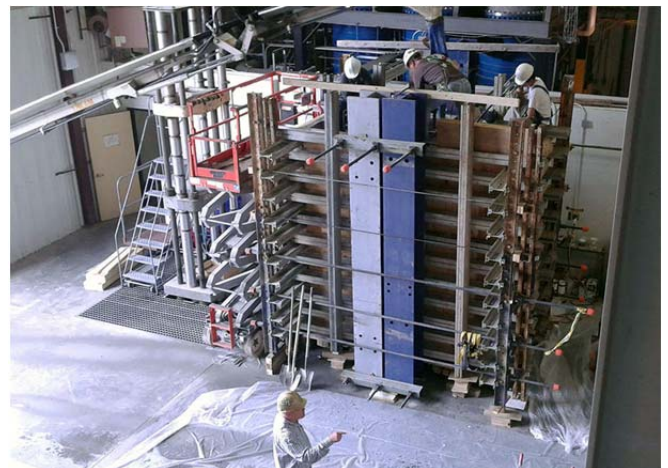
**Kimberly Kurtis, PhD, FACI, FACerS**

Professor, School of Civil and Environmental Engineering  
Associate Dean, College of Engineering  
Georgia Institute of Technology

Thursday, February 11, 2016

3:30pm – 4:30pm  
129 DeBartolo

Currently 104 commercial nuclear power reactors are licensed for operation in the U.S., together generating approximately 20% of the nation's power. Initially licensed for 40 years of operation, 73 reactors have received second-license renewals (SLRs) for an additional 20 years of operation, and 20 more sites are under consideration for SLR or have letters of intent to apply. Massive concrete construction is characteristic of these reactors. As a result, understanding and anticipation of the performance of concrete is central to assessing SLRs. However, because there is limited experience with reactors beyond 40 years of operation, research is needed (1) to understand performance, monitor degradation, and anticipate service life (i.e., durability) (2) to understand (and avoid) failures, and (3) to allow for cost-effective construction of new massive concrete facilities in cases where new construction is needed. This talk will provide an overview of interdisciplinary research ongoing at Georgia Tech which touches on each of these three needs.



*Dr. Kimberly (Kim) E. Kurtis is Associate Dean in Georgia Tech's College of Engineering and Professor in the School of Civil and Environmental Engineering. Dr. Kurtis joined Tech's faculty in January 1999. She earned her BSE (1994) in Civil Engineering from Tulane University under a Deans Honor Scholarship and her PhD (1998) in Civil Engineering from the University of California at Berkeley, where she was a Henry Hilp Fellow and a National Science Foundation (NSF) Fellow. Dr. Kurtis's innovative research on the multi-scale structure and performance of cement-based materials has resulted in more than 100 technical publications and two US patents. In addition to her technical and educational service contributions at the American Concrete Institute (ACI), American Ceramics Society (ACerS), Transportation Research Board (TRB), and Federal Highway Administration (FHWA), she has held two leadership positions – Chairman of ACI Committee 236: Materials Science of Concrete (2006-2012) and Chair of American Ceramic Society's Cements Division (2008-2009) – central to advancing science-based research on cement-based materials. Dr. Kurtis has served as Associate Editor of ASCE Journal of Materials in Civil Engineering, is an Editorial Board member of Cement and Concrete Composites, and is one of twelve members of ACI's Technical Activities Committee (TAC). She has been honored with ACI's Walter P. Moore, Jr. Faculty Achievement Award (2005), ACI's Del Bloem Award for Service (2013), Outstanding Senior Undergraduate Research Mentor Award at Georgia Institute of Technology (2013), the ACI James Instruments Award for Research on NDE of Concrete (2008), Award for Outstanding Article in ASTM's Journal of Testing and Evaluation (2010), and ASCE's Huber Civil Engineering Research Prize (2013). Dr. Kurtis is a member of the Fellow of the American Concrete Institute and the American Ceramics Society.*