NATIONAL TECHNICAL UNIVERSITY OF ATHENS
SCHOOL OF CIVIL ENGINEERING
INSTITUTE OF STEEL STRUCTURES
STEEL STRUCTURES RESEARCH SOCIETY

LECTURE

Monday 7 April 2025, 16:00

Auditorium of Institute of Steel Structures, Zografou Campus, NTUA

or you may attend online: https://centralntua.webex.com/centralntua/j.php?MTID=m31c81d5005bf0b88f9595d60d66efe25

DESIGNING FOR CLEAN ENERGY: TWO CASE STUDIES WITH DIVERSE NEEDS

Tracy Becker

Assoc. Professor and Ed & Diane Wilson Presidential Chair in Structural Engineering,
University of California, Berkeley

ABSTRACT

There is significant work for structural engineers to enable the successful transition to clean energy sources. This is true for both nascent and less regulated technologies such as solar as well as for more established and highly regulated technologies such as nuclear. This seminar will look at challenges for both of these technologies. For solar, as the cost of solar photovoltaic (PV) modules declines, the cost of the solar support structures has become a significant portion of the total cost, and thus, there is great impetus to optimize design. However, design is often done without consideration of dynamic effects and using non-standardized components and fasteners, which reduce the reliability of the system. We will discuss how a combination of wind tunnel tests, computational fluid dynamics, and finite element analysis can be used to understand loading on the system. Important to this problem is the interaction of the PV modules and the structure itself. For nuclear, there are well developed codes and standards. However, a major barrier to deployment are First of a Kind (FOAK) costs associated with the civil work, from regulation to construction. To reduce FOAK costs, a method for standardizing reactor buildings is proposed. This is particularly challenging given diverse hazards as well as technology and vendor requirements.

BRIEF CV

Tracy Becker is an Associate Professor and the Ed & Diane Wilson Presidential Chair in Structural Engineering at University of California, Berkeley. She has expertise in the design, modeling, and experimental testing of high-performance structural systems used for limiting structural and component losses in seismic events. Her research has focused on expanding the use of seismic isolation to a broader category of structures, understanding ultimate failure mechanisms of isolated buildings to ensure robust designs, and improving existing control systems to further minimize structural responses in seismic events. She received her BS in Structural Engineering from UC San Diego followed by her MS and PhD in Structural Engineering, Mechanics and Materials from UC Berkeley. Afterwards she spent almost two years as a Japanese Society for the Promotion of Science post-doctoral researcher at the Disaster Prevention Research Institute at Kyoto University.

The lecture will be recorded and the video will be posted on the SSRS or ISS YouTube account. In the video, the names of the participants may be mentioned and their faces may be shown if they have their camera open, or their possible comments or questions may be heard. Attending the lecture implies automatic acceptance of the above.