

FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM



Visit to Georgia Tech: March 27, 2015

This report summarizes the visit of **Annie Kammerer** from Annie Kammerer consulting firm that took place at the Georgia Institute of Technology on March 27, 2015.

ITINERARY OR AGENDA

TIME:	ACTIVITY:
9:00 AM – 9.30 AM	Student Chapter President (Sujith Mangalathu) and vice president (Jiqing Jiang) meets & welcomes Dr. Annie Kammerer to campus
9:30 AM – 10:00 AM	Meeting with the student chapter leadership from this year and next year's leaders
10:00 AM – 10:30 AM	Tour of campus with Visiting Professional, especially departments or labs related to EERI disciplines
10.30 AM – 10.50 AM	Meeting with School chair and EERI faculty coordinator – Dr. DesRoches
11:00 AM – 12:15 PM	Guest lecture by Visiting Professional – " <i>Seismic Design and Re-evaluation of Nuclear Plants: Past, Present and Future</i> "
12:15 PM – 1:30 PM	Lunch – Sponsored by Georgia Tech EERI chapter
1.30 PM – 3:00 PM	Informal meeting with department graduate students (soon to be graduating) for career guidance

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S):

- Reginald DesRoches, Faculty Advisor, reginald.desroches@ce.gatech.edu
- Sujith Mangalathu, President, sujithmss@gatech.edu
- Jiqing Jiang, Vice president, jjiqing@gmail.com
- Parsa Banihashemi, Secretary, parsa@gatech.edu
- Farahnaz Soleimani, Secretary, farahnazsoleimani@gmail.com
- Ajay Saini, Treasurer, ajaytrc@gmail.com

VISITING PROFESSIONAL LECTURE OVERVIEW

Lecture Abstract

Since the beginning of the nuclear power industry, the framework and methods used in the seismic design and re-evaluation of the fleet of nuclear power plants in the US has gone through significant change and advancement. This presentation—targeted to the technically-inclined layperson—will cover a wide variety of topics including:

- Basic nuclear plant design concepts (how they work and what can go wrong)
- Why the engineering of nuclear plants is unique and challenging

- Brief history of seismic regulations, design approaches, and reevaluation efforts
- The performance-based and risk-informed methods used in the industry today,
- The impact of the Fukushima Daiichi accident, including current and future NRC efforts
- The NRC, IAEA, and the new global nuclear picture

Professional Bio

Dr. Annie Kammerer is a private seismic hazard and risk consultant and a visiting scholar at the Pacific Earthquake Engineering Research Center at UC Berkeley. Her work is focused on analysis and regulatory processes associated with probabilistic seismic and tsunami hazard and risk assessments for nuclear plants and other critical facilities.

She recently finished a year as a Principal Seismologist with the Bechtel Corporation in San Francisco. Prior to that, she spent 7 years at the US Nuclear Regulatory Commission, where she coordinated the NRC Seismic Research Program. She was the project manager and contributing author of the current US guidance on performing seismic hazard assessments and seismic margin analysis for nuclear facilities. Starting in 2011, Dr. Kammerer was a member of the NRC's seismic technical team developing post-fukushima response and re-evaluation guidance. From 2012 to 2013, she was also the NRC's technical lead for a special program conducting Seismic Walkdowns of all 104 operating US nuclear plants in response to the Fukushima Daiichi accident. Dr. Kammerer is active internationally and has chaired IAEA Working Groups on seismic re-evaluation of operating reactors, tsunami, and seismic isolation.

Prior to joining the NRC in 2006, she was a consultant in the Risk and Advanced Technology groups in the international design firm, Arup. As seismic hazard lead for the Americas, her consulting work encompassed a wide variety of technical areas including geotechnical earthquake engineering, structural dynamics, seismology and risk assessment. She holds three degrees from UC Berkeley, including a PhD in geotechnical engineering with minors in strong motion seismology and structural engineering.

SUPPLEMENTAL ACTIVITIES

Welcoming the speaker (9.00 AM to 9.30 AM)

The president (Sujith Mangalathu) and vice president (Jiqing Jiang) of the GT EERI chapter welcomed the speaker from the bus station and accompanied Dr. Kammerer on a walking tour of Georgia Tech's campus. They explained some of the history and background of Georgia Tech and its buildings. They showed the speaker the various facilities across the campus and had a healthy discussion on various researches being performed by graduate students and faculty at Georgia Tech. Dr. Annie Kammerer is generous to share her experience and various roles she played in her career. She shared a brief outline of the various nuclear policies across the world and how international Atomic Energy Agency (IAEA) is working closely with various countries for the policies. The campus tour allowed her to enjoy some of the great spring weather in Atlanta.

Guest Lecture (11.00 AM – 12.15 PM)

EERI hosted the seminar which was open to the whole Civil Engineering Department at Georgia Tech. The feature of the seminar was Dr. Kammerer's presentation on "*Seismic Design and Re-evaluation of Nuclear Plants: Past, Present and Future*". Approximately 50 faculty, undergraduates, graduates, and staff attended the presentation which focused on the needs of a practical structural/nuclear engineer today. The initial part of the presentation was focused on the various nuclear plants existing in the world and the evolution of various nuclear plants. She discussed the importance of considering seismic forces in the design of nuclear structures and necessitated the need for probabilistic risk assessment. She also discussed the failure of various nuclear

plans and reasons behind those failures. The highlight of the presentation was the impact of the Fukushima Daiichi accident and its impact on the current nuclear design. She pointed out the current efforts to avoid such further issues. Dr. Kammerer was generous enough to answer all the questions regarding the policies, technical challenges and environmental issues. The presentation was concluded by recognizing the fact that structural engineers need to go beyond just the basic technical engineering mechanics and dynamics and the structures should be prepared for the worst design scenario. The seminar was well received by all in attendance with many of the faculty and students saying that it was one of the best seminars that they had attended.



Figure 1a: GT EERI President introducing Dr. Kammerer, 1b: Enthusiastic students listening to the presentation



Figure 2a: Dr. Kammerer explains the nuclear plants, 2b: GT EERI officers with the speaker (From left: Sujith Mangalathu, Parsa Banihashemi, Farahnaz Soleimani, Dr. Kammerer, Jiqing Jiang, Ajai Saini and Edwin Lim)

Lunch

The visit reached its pinnacle during the lunch time at a local restaurant with a couple of the EERI members and faculties (Sujith Mangalathu, Farahnaz Soleimani, Jiqing Jiang, Edwin Lim, Parsa Banihashemi, Dr. Iris Tien, Xiaojia Zhang, Ke Liu, Heng Chi and Ajai Saini). Further discussion continued over lunch about some of the aspects of

nuclear engineering brought up earlier in that day. Various topics such as vulnerability of various nuclear plants, limitations of various software's, future of nuclear engineers etc. were discussed. Dr. Kammerer shared her industrial experience and how she was able to manage the various roles in her career. Lunch also provided a means of feedback on how the visit ran from both Kammerer's perspective and those at Georgia Tech. It was concluded that David's visit was entirely successful in reaching the goals of the visiting professionals program and all were pleased with how the day had progressed.



Figure 3: Lunch meeting (From left- Dr. Kammerer, Dr. Tien, Xiaojia Zhang, Ke Liu, Heng Chi, Parsa Banihashemi, Sujith Mangalathu, Jiqing Jiang, Farahnaz Soleimani and Ajai Saini)

ACKNOWLEDGEMENTS

The Georgia Tech EERI student chapter is grateful for the support that EERI and the Friedman Family Visiting Professional Program has given in regards to Dr. Kammerer's visit. The success of the visit is a true testament to the programs ability to bring the professional side of earthquake engineering together and provide a unique opportunity for students to see what their future may hold. The experience and knowledge brought by Dr. Kammerer was both interesting and educational for the Department of Civil Engineering at Georgia Tech. An immense thanks goes out to Dr. Annie Kammerer and all of those involved with making this visit possible.

LIST OF ATTACHMENTS

Included at the end of this report are various attachments to supplement the information included above. A list of the attachments is included below:

- Item 1, Slides of the lecture

Photo Courtesies: Ajai Saini, Edwin Lim