B.S. Abdur Rahman ™ Crescent Institute of Science & Technology
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SCHOOL OF INFRASTRUCTURE

DEPARTMENT OF CIVIL ENGINEERING

Ref.:912 / Dean(Sol) / 0924 **Date: 24.09.2024**

Technical Talk on

Seismic Analysis and Special Concretes for Nuclear Safety related Structures

Date: 23.08.2024 **Time: 10.30 a.m. to 12.30 p.m.**

I. PREAMBLE:

As part of the M.Tech (Structural Engineering) curriculum of the Department of Civil Engineering, B S Abdur Rahman Crescent Institute of Science and Technology, a technical talk was arranged for the courses CEE6101, Advanced Design of Concrete Structures and CEE6102, Dynamics of Structures on 23rd August 2024 from 10.30 a.m. to 12.30 p.m.

II. ABOUT THE SPEAKER

Dr. G. Padmanabhan is a distinguished Senior Scientific Officer working in Bhabha Atomic Research Centre with an experience of 23 years in design and construction of nuclear power plants and other nuclear facilities. He is an expert in Geotechnical earthquake engineering, finite element analysis, geotechnical investigations & ground improvement methods, contract management and construction. He has more than 20 publications in national and international journals. Currently he is a faculty member of Homi Bhabha National Institute, Mumbai and also in reviewer panel board of M.Tech and PhD thesis from various universities. He is in panel board of various reputed journals as a reviewer. He is life member of Indian Geotechnical Society, Indian Nuclear Society, Indian concrete institute etc. He had actively collaborated with various academic and Research institutions namely IISc Bangalore, IIT-Chennai, Anna University, Central Water Power Research Institute -Pune, and Central institute of mining and fuel research.

Technical Talk Brochure

III. ABOUT THE SESSION:

Dr. J. Revathy, Professor of Civil Engineering welcomed the participants and provided an overview on the technical talk organised as part of the M.Tech (Structural Engineering) curriculum. The talk was specifically arranged to supplement two courses: CEE6101 Advanced Design of Concrete Structures and CEE6102 Dynamics of Structures. As the course teacher for CEE6101 Advanced Design of Concrete Structures, Dr. Revathy explained that the session would help students understand how the use of special concrete materials influences the deflection and cracking of structures under various types of loading conditions.

Following this, Dr. P. Gajalakshmi, Professor of Civil Engineering introduced the guest speaker. As a course teacher for CEE6102 Dynamics of Structures, she emphasized that the participants would gain knowledge on the challenges and innovations in sustainable concrete materials, with a particular focus on designing structures subjected to accidental loading, especially in the context of Nuclear Power Plants.

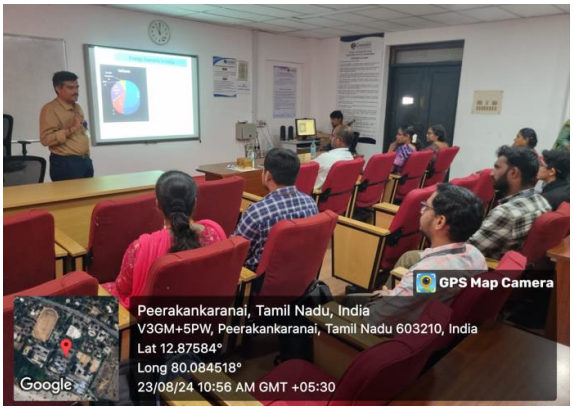
Dr. G. Padmanabhan, the guest speaker, covered the key topics including the importance of deflection and cracking in structures, the use of special concretes and the seismic analysis of nuclear safety-related structures. He explained that nuclear power plants and related facilities must be designed to withstand natural disasters, such as earthquakes, to ensure the safety of the plant and the surrounding environment.

Dr. Padmanabhan's presentation focused on methodologies for seismic analysis, the challenges of excavation for nuclear structures, and the various types of concrete specifically formulated to enhance the safety and durability of nuclear reactors. He highlighted that seismic analysis is a critical component in the design and construction of nuclear safety-related structures. The primary goal is to assess the structure's ability to withstand forces and displacements caused by seismic events, using advanced computational models to simulate earthquake impacts on nuclear facilities.

The importance of considering factors such as soil-structure interaction, dynamic response characteristics, and the potential for seismic-induced structural failures was emphasized. Dr. Padmanabhan stressed that accurate seismic analysis is essential to ensure the resilience of nuclear facilities to seismic activities, thereby minimizing the risk of radiation leaks or catastrophic failures.

He also explained the use of Self-Compacting Concrete (SCC) in nuclear construction, which offers the advantage of high flowability, enabling it to fill complex formwork without the need for mechanical vibration. This reduces the risk of voids and improves the overall quality and integrity of the concrete structure. Such specialized concretes are crucial for ensuring the safety and reliability of nuclear reactors, providing the necessary strength, durability, and radiation protection required for the safe operation of nuclear power plants.

Introduction of Guest by Dr. P. Gajalakshmi, Professor of Civil Engineering



Dr. Padmanabhan, Senior Scientific Officer, BARC delivering the lecture

IV. DETAILS OF PARTICIPANTS:

The following are the list of participants of I & II-year M. Tech (Structural Engineering) & Ph.D. Scholars attended the technical talk:

Sl. No.	Name	RRN
1.	Derrick Shalvin M	241202601001
2.	Giri Ravendar M	241202601002
3.	Gokul Prasadh N	241202601003
4.	Hudson Gnanadurai C	241202601004
5.	Jessica Jenny James	241202601005
6.	Lavanya D	241202601006
7.	C G Lohith	241202601007
8.	Mohamed Zuhairudeen A	241202601008
9.	Sethu Raman	241202601009
10.	Muhammad Ibrahim L	231202601003
11.	A. Hrithik Ramkumar	231202601002
12.	M.Charumathi	231202601001
13.	Saran.T	231202601005
14.	Praveen J	231202601007
15.	Naveen E	231202601004
16.	Shaik Davood	231202601006
17.	Thasmeer Khan	240803701001
18.	S. Mahalakshmi	240803101003

V. OUTCOME:

- Students will be able to select appropriate special concrete materials and describe the design and loading conditions of structures subjected to extreme forces, particularly in nuclear power plants.
- Students will have the opportunity to design and analyse critical concrete structures subjected to seismic loading, with a focus on evaluating deflection and cracking behaviour under various loading conditions.
- Students will learn to assess the seismic performance of structures using advanced computational models, ensuring resilience against seismic events.

24/09/2024	24/09/24	24/09/24
Dr. J. Revathy	**Dr. P. Gajalakshmi**	**Dr. M.S. Haji Sheik Mohammed**
Professor	**Professor**	**Dean, School of Infrastructure**

Dr. M.S. Haji Sheik Mohammed
B.E.,M.S.,Ph.D.,M.ICI.,F.ACCE(I).,M.AMPP.,M.RILEM.,M.ASCE
Dean (School of Infrastructure)
B.S. Abdur Rahman Crescent Institute of Science and Technology
Vandalur, Chennai - 600048, INDIA