Proceedings of 7th National Conference on Wind Engineering (VII-NCWE)

Nov 21-22, 2014

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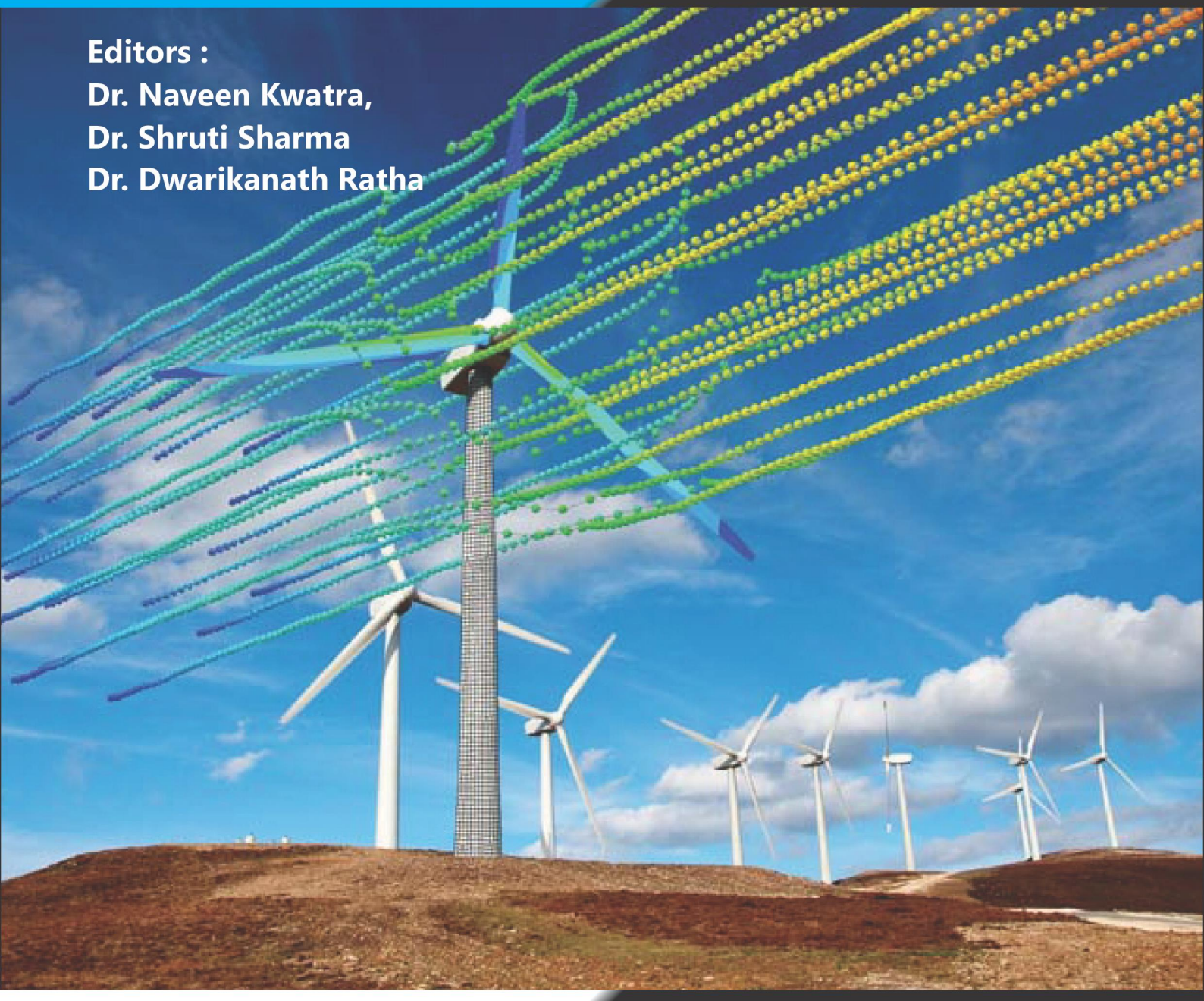

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ISWE

INDIAN SOCIETY FOR WIND ENGINEERING

Proceedings of the 7th National Conference on "Wind Engineering (VII-NCWE)

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Organized by

Department of Civil Engineering

Thapar University, Patiala

and

Indian Society for Wind Engineering

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Foreword

It gives me immense pleasure in writing this foreword to the proceedings of the 7thNational Conference on Wind Engineering being organized from November 21-22,2014 jointly by the Department of Civil Engineering and The Indian Society for Wind Engineering.The proceedings comprise of seven keynote papers and thirty contributed technical papers. All these papers are significant and focus on the latest developments in wind engineering.

Wind engineering deals with effect of wind on the natural and the built environment and the possible damage, inconvenience or benefit with may result from wind in the field of structural engineering. It includes strong winds, which may cause discomfort as well as extreme winds such as tornado, hurricane or heavy storm, which may cause widespread destruction. In the fields of wind energy and air pollution, it also includes low and moderate winds as these are relevant to electricity production and dispersion of contaminants. Wind Engineering draws upon meteorology, fluid dynamics, mechanics, geographic information systems and a number of specialized engineering disciplines including aerodynamics and structural dynamics.

I am pleased to see that the almost all the current aspects of concrete, there pomposities and techniques are being presented in this conference by the various research groups across the country.

I do hope that the results and techniques which are compiled in the proceedings will be useful to all concerned i.e. users, researchers, teachers, scientists and technologists alike for the welfare of humankind and society at large.

I wish the National Conference all success.

(Dr. PrakashGoplan)
Director
Thapar University

PREFACE

Wind storms and their effects on infrastructures have always been an area of wide and vital interest to the engineers worldwide. The subject of wind engineering comprises of various aspects of effect of wind on structures, mitigation of devastation caused by wind storms, dispersion of effluents in the air etc. While investigating the effects of winds on structures remains a key area of research using sophisticated instrumentation and wind tunnel studies, computational fluid dynamics is an emerging area of interest among the researchers worldwide.

Wind produces three different types of effects on structures: static, dynamic and aero dynamic. The response of wind load depends on type of structure. When the structure deflects in response to wind load then the dynamic and aerodynamic effects should be analysed in addition to static effect. Sound knowledge of fluid and structural mechanics helps in understanding of details of interaction between wind flow and civil engineering structures or buildings. Flexible slender structures and structural elements are subjected to wind induced along and across the direction of wind. When considering the response of a tall building to wind gusts, both along-wind and across-wind responses must be considered. These arise from different the former being primarily due to buffeting effects caused by turbulence; the latter being primarily due to alternate-side vortex shedding. The cross-wind response may be of particular importance because it is likely to exceed along-wind accelerations if the building is slender about both axes.

India is a country affected by frequent wind storms and fast growing air pollution problems due to rapid industrial growth. This is one of the reasons for active wind related research activities in India. Researchers in India have to continuously meet the demands and requirements of construction industry vis-à-vis wind effects as well as play an important role in the reconstruction and rehabilitation programmes due to damaging effects of wind storm in coastal areas. On of the major challenges is the design and construction of long span , slender and high rise steel buildings on account of their sensitivity to wind induced effects. Most of the research is focussed on small scale models in wind tunnels, the validation of the results thus obtained by instrumenting some full scale models is fast emerging as an important area of research.

Efforts in Industrial Wind Engineering in India were initiated by Indian Institute of Science, Bangalore in 1960's. Further SERC, Chennai and IIT Roorkee are few institutions in India

actively involved in wind related research activities. Indian Society of Wind Engineering (ISWE) offers a common platform for all the people working in the area of wind related research to share their research ideas and inputs. The society organizes national conference on Wind Engineering every year. This year the 7th National Conference on Wind Engineering is being organized by Thapar University, Patiala and ISWE jointly. We hope that the key note lectures and the research papers will benefit the wind engineering fraternity and will pave the way for future strategies to meet the demands of the nation in the new era. The editors of the conference thank the key note speakers and the authors of the research papers for their useful contributions which will go a long way in making this conference a big success.

Dr. Naveen Kwatra

Dr. Shruti Sharma

Dr. Dwarika Nath Ratha

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