

**INTERNATIONAL TRAINING PROGRAM
ON
Lightning Protection: DEFENCE AGAINST
the Killer from the Blues
(A VIRTUAL EVENT)**

26TH AUGUST 2020

ORGANISED BY



**CENTRE OF EXCELLENCE IN HIGH
VOLTAGE ENGINEERING
UNIVERSITY OF THE WITWATERSRAND,
JOHANNESBURG, SOUTH AFRICA**



**CENTRE FOR SCIENCE & TECHNOLOGY
OF THE NON-ALIGNED AND OTHER
DEVELOPING COUNTRIES
(NAM S&T CENTRE)
NEW DELHI, INDIA**

INTRODUCTION

Lightning is a naturally occurring electric discharge caused by electromagnetic field imbalances between clouds and the ground, or within the clouds themselves. As a thundercloud (known as Cumulonimbus) matures, colliding particles of rain, ice or snow inside, separate charge with opposite polarity. Typically, the positively charged particles reach upper layers of the cloud whereas negative charge deposits at the lower layers. As the field strengths exceed certain thresholds, discharge takes place inside the cloud and consequently a charged channel starts extending towards ground. Usually, such channels carry negative charge, thus as they approach ground, the objects on ground, like steeples, trees, and the soil or water itself, become positively charged. Thus, those objects send positively charged channels towards the down coming channel tip. As one of the upward channels meets the channel from the cloud, a large current flows through the object that sent the successful channel. Then the object is said to be "lightning struck".

Even though lightning is a spectacular phenomenon, it is dangerous. Lightning often causes death, injury and property damage, most commonly in tropical and subtropical areas where lightning ground flash density and populations are high. Unfortunately, in many such regions in the developing world safe shelters against lightning are not readily available. Thus, the public is at a high risk of lightning injury when they are involved in labour intensive work such as animal husbandry and farming, when they do not have access to lightning safe structures for habitation and work. Apart from human injuries, lightning leads to property damage, service interruptions, data and signal corruption causing financial losses into the tunes of many billion USD per year. Sometimes, downtime losses exceed the recovery cost of physical damages. Thus, lightning safety and protection measures may save a fortune for any country that experiences high density of thunderstorms.

In order to impart basic knowledge on various aspects of the lightning phenomenon to the scientists and professionals of the NAM and other developing countries, the Centre for Science & Technology of the Non-Aligned and Other Developing Countries (**NAM S&T Centre**), New Delhi, India jointly with the Center of Excellence on High Voltage Engineering, **University of the Witwatersrand**, Johannesburg, South Africa announces the organisation of an International Training Program on "**Lightning Protection: Defence Against the Killer from the Blues**" on **26 August 2020**. The event will be hosted by the Center of Excellence on High Voltage Engineering, University of the Witwatersrand and will be organized in Virtual Mode.

OBJECTIVES

The Training Program intends to provide basic knowledge on the lightning as a scientific phenomenon, threats and risks to the human beings and living environment due to lightning, protection of buildings and equipment, lightning safety of underprivileged communities and low cost protection measures. The development of lightning protection and earthing related business models at SME level will also be discussed. For the non-profit-earning organizations, a briefing will be given on how to develop and sustain lightning safety education, advisory and

research centers in developing countries giving examples of success and failure stories. The secondary objective of this program is to strengthen the already established non-formal platform for those who are interested in lightning safety promotion and protection engineering and thunderstorm research, as a result of previously pioneering events in several countries organized by the NAM S&T Centre.

TOPICS TO BE COVERED

The following key topics would be discussed during the Virtual Training Program:

- ❖ Understanding the phenomena of lightning
- ❖ Lightning accidents and levels of risk
- ❖ Introduction to international/national lightning standards
- ❖ Basic concepts of structural protection and earthing
- ❖ Protection of low voltage power systems
- ❖ Protection of signal and data systems including shielding and bonding
- ❖ Lightning safety and education
- ❖ Low cost solutions for lightning protection
- ❖ Lightning protection as a small and medium scale entrepreneurship
- ❖ Development of Lightning Centres

IMPORTANT DATES

Date of the Program	26th August 2020
Submission of Application Starts	15th June 2020
Last Date for Submission of Application	20th July 2020
Confirmation to Selected Applicants	27th July 2020

PROGRAMME

A tentative program of the event is given below:

Date of Program: 26th August 2020		
<i>Time</i> SA Time (GMT+2)	<i>Theme of Training</i> <i>Lecture</i>	<i>Resource Person</i>
9.30 – 10.00	Inauguration and Introduction	Dr. Amitava Bandopadhyay / Prof. Chandima Gomes
10.00 – 10.30	Fundamentals of Lightning	Dr. Shriram Sharma
10.30 – 11.00	Lightning Accidents and Risk Levels	Mr. Ron Holle
11.00 – 12.00	Structural Protections	Mr. Alexis Barwise
12.00 – 13.00	Protection of LV and ELV Systems	Prof. Chandima Gomes
13.00 – 14.00	BREAK	
14.00 – 14.30	Lightning Safety Education	Prof. Mary Ann Cooper
14.30 – 15.30	Entrepreneurship and Development of Training Centres	Prof. Chandima Gomes
15.30 – 16.30	Discussion and Concluding Remarks	Panel of all Speakers

The Participants of the Virtual Training Program will receive a Participation Certificate electronically.

ABOUT THE ORGANISERS

NAM S&T CENTRE

The Centre for Science and Technology of the Non-Aligned and Other Developing Countries (*NAM S&T Centre*; www.namstct.org) is an Inter-governmental Organisation with a Membership of 47 countries spread over Asia, Africa, Middle East and Latin America. The Centre was set up in 1989 in New Delhi, India to undertake a variety of programmes, including organisation of workshops, symposiums and training courses and implementation of collaborative projects. It also offers short-term *Research Fellowships* to scientists from developing countries in association with the *Centres of Excellence* in various countries. The Centre also brings out technical books and other scientific publications in different subjects of interest to developing countries. The Centre's activities provide opportunity for scientist-to-scientist contact and interactions; familiarising participants on the latest

developments and techniques in the subject areas; identification of the requirements of training and expert assistance; locating technologies for transfer between the members and other developing countries, and dissemination of S&T information etc. In addition, the Centre encourages Academic-R&D-Industry interactions in the developing countries through its *NAM S&T-Industry Network*.

UNIVERSITY OF THE WITWATERSRAND, CENTER OF EXCELLENCE ON HIGH VOLTAGE ENGINEERING

The University of the Witwatersrand, Johannesburg (<https://www.wits.ac.za/>) is a multi-campus South African public research university, situated in the northern areas of central Johannesburg. It is more commonly known as Wits University or Wits. The university has its roots in the mining industry, as do Johannesburg and the Witwatersrand in general. Founded in 1896 as the South African School of Mines in Kimberley, it is the third oldest South African university in continuous operation. The 2017 Academic Ranking of World Universities (ARWU) places Wits University, with its overall score, as the highest ranked university in Africa. Wits was ranked as the top university in South Africa in the Center for World University Rankings (CWUR) in 2016. For a long period, Wits remains as one of the highest ranked universities in the African continent. Center of Excellence on High Voltage Engineering, is a key research center at the Faculty of Engineering and Built Environment at Wits University, dedicated to a wide spectrum of electrical engineering subjects including high voltage and discharge engineering, power system protection, lightning protection, grounding and bonding, and energy security.

PARTICIPANTS

Young researchers, scientists, government officials and policy makers, and representatives from industry and non-government organizations - who are engaged in lightning science research and lightning protection programs are invited to participate in this Virtual Training Program. The combination of participants from various developing countries will allow for exchange of knowledge, ideas and experiences as well as opportunities for global networking and collaboration.

RESOURCE PERSONS

The Training Programme would be designed and coordinated by Prof. Chandima Gomes, Director, Center of Excellence on High Voltage Engineering, University of the Witwatersrand, Johannesburg. Other resource persons for the Virtual Training Program will comprise eminent experts and professionals with expertise in the relevant fields from South Africa and other countries, as listed below;

- ❖ Dr. Shriram Sharma: Assistant Professor, Tribuvan University, Nepal
- ❖ Mr. Ron Holle, Senior Scientist, VAISALA, USA
- ❖ Mr. Alexis Barwise, Chairman, TC 81 Mirror Committee (IEC 62305), South Africa
- ❖ Prof. Mary Ann Cooper, Director, African Centers for Lightning and Electromagnetics (ACLENet), Uganda

SUBMISSION OF APPLICATION

Scientists, researchers and other professionals desirous of participating in the Virtual Training Program, **except those from South Africa**, should submit their filled-in application **electronically** directly to the NAM S&T Centre (E-Mail: namstcentre@gmail.com) as early as possible, but latest by **Monday, 20th July 2020**.

Applicants from South Africa should, however, submit their requests directly to the University of the Witwatersrand, Johannesburg (E-Mail: chandima.gomes@wits.ac.za).

The following documents must be submitted as e-mail attachments:

- i. Filled in Application Form (Blank form **enclosed**)
- ii. A short CV (**maximum two pages; in MS-Word format**) [Format **Enclosed**]
- iii. Opinion (**a short para; in MS-Word format**) how you qualify to participate in the Conference.

SELECTION OF APPLICANTS

Selection of applicants will be made based on their academic and professional background, and relevance of their current engagements in the field of lightning science and lightning protection. Only a limited number of participants will be selected from various countries in order to ensure organized deliberations and exchange of information and expertise among the participants. Successful applicants will be electronically informed about their selection by **27th July 2020**. The details about the virtual platform that will be used for the Training Program and *log-in details* for joining the program will also be communicated to the selected applicants. Other details and terms & conditions for the participation of scientists from various countries will be given to the individual candidates on receipt of their applications.

CONTACT DETAILS

NAM S&T CENTRE

Dr. Amitava Bandopadhyay

Director General

Centre for Science & Technology of the Non-Aligned and other Developing Countries (NAM S&T Centre)

Core - 6A, 2nd Floor, India Habitat Centre, Lodhi Road

New Delhi – 110003, India

Tel: +91-11-24645134, 24644974; **Fax:** +91-11-24644973

E-mail: namstcentre@gmail.com, namstct@bol.net.in

Website: <http://www.namstct.org>

UNIVERSITY OF THE WITWATERSRAND

Prof. Chandima Gomes

Chair, ESKOM Power Plant Engineering Institute (EPPEI)-HVAC

Director, Center of Excellence on High Voltage Engineering

School of Electrical & Information Engineering

University of the Witwatersrand

Johannesburg, South Africa

Tel: +27 672179416

E-Mail: chandima.gomes@wits.ac.za

Website: <https://www.wits.ac.za/>