

Interactive Workshop
on
Earthing Systems

17-18 September 2012
Venue: CBIP Conference Hall
Malcha Marg, Chanakyapuri, New Delhi



Organized by

Central Board of Irrigation & Power



In association with

**INTERNATIONAL ASSOCIATION ON ELECTRICITY GENERATION, TRANSMISSION
AND DISTRIBUTION (Afro-Asian Region)**

Sponsored by



MANAV
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James Durrans Group – South Yorkshire U.K.

Introduction:

The Central Board of Irrigation & Power in association with International Association on Electricity Generation, Transmission and Distribution (Afro-Asian Region) is organizing an Interactive Workshop on "Earthing Systems" on 17-18 September 2012 at Conference Hall of Central Board of Irrigation & Power, Malcha Marg, Chanakyapuri, New Delhi 110021. M/s. Manav Energy Pvt. Ltd. and M/s. Marconite are the main sponsor for this workshop.

Aims and objective:

CBIP has been organizing workshops on earthing of electric power stations from time to time. The last one was held in September 2011 which was much appreciated by delegates who had come from all over India. Since then, numerous requests have been received by CBIP to organize another workshop on this subject. In view of the pressing demand, CBIP has again taken initiative to organize another **Interactive Workshop on "Earthing Systems" on 17-18 September 2012** with the aim to update the knowledge of professionals about the current techniques in Earthing Systems and to discuss the various problems related thereto. Proceedings of this workshop will also help the professionals in improving the performance and reliability of electrical power system, which is the need of the hour.

It is pertinent to mention that Earthing plays an important role in proper operation of generation, transmission and distribution systems. The function of earthing in an electric power system is to (i) maintain the potential of current carrying as well as non-current carrying parts of equipment, apparatus and appliances connected to the system, and (ii) to ensure safety of equipment and personnel and correct operation of protective devices during earth faults. Earthing also provides safety during lightning strikes on equipment or structures and on occurrence of induced voltages and currents on equipments of an electric system. A proper earthing system provides easy and shortest path to the flow of earth fault current without adversely affecting the continuity of service. It also ensures that a person present in the station area is not exposed to danger of electric shock.

The efficacy of an earthing system depends on various factors like resistivity of general mass of earth in and around the area where earth grid is buried and also that of surface layer of soil, duration and magnitude of fault current and grid current, shock duration, the maximum safe current that a human body can tolerate and the permissible values of dangerous voltages that shall arise due to the flow of grid current. Earthing of fence is another issue of importance.

TOPICS: Various topics of interest have been identified for deliberation during this workshop.

- Types of earthing and design parameters
- Latest International concepts of Earthing
- New concepts of Earthing – SIGMA Earth; dissipating faults of Variable frequencies
- IEEE 80 2000 (Grounding substation earthing)
- Earthing of generating plants, modern electric grid substations, transmission lines, distribution lines, generating plants, and load distribution centers
- Use of computer software for earthing design
- Current for design of earthing system
- Earthing of electronic equipment in power stations
- Role of earthing in protection of installations and equipment from lightening
- Soil resistivity measurements and interpretation
- Requirements of earthing in hilly, and corrosion prone areas
- Testing, installation, and inspection and maintenance together with their periodicity
- Case studies.

Software for (i) computation of grid current and for (ii) evaluation of two layer soil model shall be included with the workshop proceeding to be distributed to the participants. In order to make participants conversant with the use of software, practical sessions on the use of the software for evaluation of grid current and two layer soil model shall be held. The focus and the extent of these sessions will be adjusted depending on the need and interest of the participants.

FACULTY

Eminent experts from Utilities, Manufacturing organizations and Academic field shall be drawn as faculty. The following renowned experts in field of Earthing have confirmed to deliver the lecture during the Workshop.

Shri Mata Prasad, Former President CIGRE India, Dr. Hans R. Seedher, Ex Professor & Head, Electrical Engineering Department, Punjab Engineering College, Ms. Anjali Chandra, Executive Director, Delhi Electricity Regulatory Commission, Shri Sonjib Banerjee, Technical Director - Duval Messien, France and Manav Energy Pvt. Ltd., Shri Sujeet Mishra, Director, RDSO, Shri S. K. Ray Mohapatra, SE/Director, North Eastern Regional Power Committee/ Central Electricity Authority, Shri H. Jayakumar, Former Joint Director, CPRI, Shri V. Venkatesh, Dy. General Manager, NTPC Ltd., Shri K. K. Sarkar, Chief Design Engineer, Power Grid Corporation of India Ltd., Shri Arunabha Basu, Vice President and Head (Technology), NDPL and Shri Nihar Raj, Assistant Vice President, ABB Ltd.

DATES AND VENUE

The Workshop will be held on **17-18 September 2012** in the Conference Hall of Central Board of Irrigation & Power, Malcha Marg, Chanakyapuri, New Delhi - 110 021.

CALL FOR PAPERS

Experts who desire to participate by delivering lectures on different aspects of Earthing including case studies are requested to furnish the write-ups to reach CBIP office latest by 10th September 2012.

WHO SHOULD ATTEND

The workshop will be of special interest to:

- Planners, Independent power producers, Operators, Consultants, Electrical Contractors
- Researchers / Academicians, Manufacturers, Power Utilities / Corporations, State Govt. / SEBs, etc.

REGISTRATION

The perspective participants, desirous of attending the Workshop may register themselves by sending the following details to CBIP along with necessary payments:

Delegate Name: _____

Designation: _____

Organisation: _____

Mailing address: _____

Phone/Fax/E-mail: _____

Registration Fee for CBIP/AARO Members Rs. 9,000/- and for Non-Members Rs. 10,000/-. Service Tax 12.36% extra.

The registration fees includes, working lunch, tea during the programme, a copy of the workshop proceeding (including software for evaluation of grid current and two layer soil model) and a copy of the latest **"Manual on Earthing of AC Power Systems"**. Registration fee does not include payment for hotel accommodation or meals except those specifically indicated in the programme. The participants will have to make their own arrangements for boarding and lodging, transport etc. at New Delhi.

OTHER ATTRACTIONS

Scope exists for organizations to be sponsor on lump sum payment with following attendant benefits:

Category	Fee	Delegates free	Colored advt.
Sponsor	Rs. 2,00,000	10	2 pages
Co-sponsor	Rs. 1,00,000	5	1 pages

PAYMENTS

All payments are to be made by the following methods:

By DD/Cheque in favour of 'Central Board of Irrigation and Power' payable at New Delhi



ADDRESS FOR CORRESPONDENCE

All correspondences relating to the event should be addressed to:

V. K. Kanjlia <i>Secretary</i> Central Board of Irrigation & Power CBIP Building, Malcha Marg, Chanakyapuri, New Delhi-110021	Phone : 91 11 2611 5984/2611 1294/2611 6567; Fax : 91 11 2611 6347 E-Mail : batra@cbip.org ; cbip.batra@yahoo.com , cbip@cbip.org ;
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FACULTY

Eminent experts from Utilities, Manufacturing organisation and academic institutes shall be drawn as faculty. The lists of experts who have confirmed to deliver the lecture are:

 <p>Shri Mata Prasad</p>	<p>Shri Mata Prasad is Internationally known expert and recipient prestigious Technical Committee award from CIGRE, Paris and also Founder President, CIGRE India. Shri Mata Prasad did his B. Sc (Engg) from BHU in 1954 and served UPSEB from 1954 till 1984 in various capacities from Assistant Engineer to Chief Engineer handling Hydro Generation Project (6*50 MW units), Thermal Power Plants at Obra and Harduaganj. He was responsible for developing the 400 kV substations and optimizing the parameters through field tests. From 1984 to 1993 he was with NTPC responsible for 400 kV network expansions interconnecting all the regions of India. During the same period he was also involved in bringing HVDC Back-to- Back and Bulk Power Long distance HVDC transmissions. From 1993 to 2003 he was with ABB as Technical Advisor. Presently he is associated with CPRI, PGCIL in various activities of R&D and UHVDC Transmission. He is recipient of several prestigious awards from CBIP, IEEMA, Institution of Engineers (I), CIGRE (Paris) as Distinguished Member and also CIGRE Technical Committee Award. He was conferred with Life Time Achievement Award for his contribution in Power System in 2008 and in the same year was adjudged as Protection Guri by PAC World from California USA. Shri Mata Prasad has presented about 116 papers in various Indian and International Journals, Workshops and Conferences.</p>
 <p>Dr. H. R. Seedher</p>	<p>Dr. H. R. Seedher received the B.Sc. Engg., M.Sc. Engg., and Ph.D degrees in Electrical Engineering from Panjab University, Chandigarh in 1968, 1971, and 1980 respectively. Dr Seedher joined the teaching faculty of Panjab Engineering College, Chandigarh in August 1969 and retired there from as Professor and Head of Electrical Engineering Department in February 2004. He worked as Professor of Electrical Engineering with UIET, Panjab University, Chandigarh from June 2004 to May 2007.</p> <p>The main area of research of Dr Seedher is Power System Grounding. He has published a number of research papers in this area in reputed national and international journals. He has coordinated a CBIP Workshop on Design of Earthing System at Punjab Engineering College. He has also coordinated a CBIP funded research project on earthing system at Punjab engineering College. He has worked as a consultant for design of grounding system for a number of power stations. He has made significant contribution in the writing of the 'Manual on Earthing of AC Power Systems' published by CBIP.</p>
<p>Ms. Anjali Chandra</p>	<p>Ms Anjali Chandra, Executive Director, DERC is B.E. Electrical and MBA from Punjab University, Patiala and is currently working as Director, Delhi Electricity Regulatory Commission. Ms. Anjali Chandra has work experience of over 28 years in different capacities in the various formations / Divisions of Central Electricity Authority and Punjab State Electricity Board. She has acquired technical expertise during her service in the field of planning, design, monitoring, supervision and administration. She has authored 37 papers and is an active member of the Institution of engineers. She is actively involved in the formulation of construction standards for lines of 33 kV and below and Sub-stations of 33 kV and below. She is also involved in evaluation of the latest technologies in the field of Distribution for loss reduction, improvement in quality and reliability of power. She has prepared guidelines for foundation of project report for development of sub transmission and distribution system under the guidance of committee of experts and the guidelines are well recognized by the distribution engineers.</p>



Shri Sonjib Banerjee

Shri Sonjib Banerjee is Technical Director - Duval Messien (France based 178 years old company) known worldwide for hi-tech Earthing solutions & Lightning protection technologies. He has brought new innovative solutions on critical and sensitive electrical installations through his companies-SGI Engineers (India) and Manav Enterprises (Dubai). He has been awarded the Man of The Year (2010) for Infrastructure Safety by US-Asia Business Forum in Los Angeles. He has successfully revamped and strengthened earthing systems for various Power, Oil & Gas, Defence organizations in India. He has trained many engineers and corporate teams for updated International Standards for earthing and lightning protection. He is currently researching on Remote monitoring of earthing systems, EMF & electro-statics. He has uniquely combined soil-science, metallurgy and chemical engineering to offer long-term & maintenance free solutions for high resistance and sensitive electrical earthings.



Shri Sujeet Mishra

Shri Sujeet Mishra, belongs to the Indian Railways Service of Electrical Engineers. He has been instrumental in the design of new classes of electric locomotives and laid framework for the introduction of new generation of control & communication and drives for the electric locomotives for the Indian Railways. He is currently Director (Traction Installations Directorate) with Research, Designs & Standards Organisation under the Ministry of Railways and responsible for the traction power supply which includes transformers, switchgear, SCADA, protection and power quality for the Indian Railways' electrified network. He is actively involved with BIS and CEA on introduction of safer transformer fluids in the country. His work in simulation of rolling stock forms the basis of train performance calculator of Software Aided Train Scheduling and Network Governance a pioneering project being done by Centre for Railway Information Systems.



Shri Arunabha Basu

Shri Arunabha Basu is an Electrical engineer with specialization in Industrial Electronics and Automation. He has more than three decades of rich work experience in various industries ranging from power plants to specialized Industrial Electronics and Automation Companies like National Thermal Power Corporation, India (NTPC), Rockwell Automation and Lahmeyer International. Arunabha has significant achievements in his career including introduction of microprocessor based control system in Indian Industries and has been a strong advocate for new technology adaption. Currently, he is Vice President and Head (Technology) with North Delhi Power Limited (NDPL, a TATA group company) in India, responsible for distribution of electricity in a significant portion of India's capital. In NDPL, he is responsible for major technology intervention including Smart Grid Initiatives. At work, the challenge before him is to build a smart distribution network and have a detailed and accurate record of NDPL's distribution assets.



Shri S.K. Ray Mohapatra

Shri Sushant Kumar Ray Mohapatra is the SE/Director, North Eastern Regional Power Committee (CEA). He was born in Orissa, India in 1961. He graduated in Electrical Engineering from Sambalpur University, Orissa in 1982 and had his Master's Degrees and MBA from Indian Institute of Technology, Kharagpur and Faculty of Management Studies, University of Delhi in 1984 and 2003 respectively. His professional experience of more than 20 years includes Project appraisal, tendering & procurement, design and engineering of EHV substations with the Central Electricity Authority of Government of India, identification and investigation work for harnessing hydro power potential (micro / mini / small hydroelectric power projects) and assessment of wind power potential with Govt. of Orissa(India) and testing & quality control of PVC & XLPE cables of 11kV and 33kV grade with M/s NICCO Orissa Ltd., India. He has already contributed many papers and articles in various Seminars & Journals and representing as a member in various technical committees of CBI&P, India.



Shri H. Jayakumar

Shri H. Jayakumar is Director Galaxy Earthing Electrode, Chennai. Prior to this he worked with Central Power Research Institute as Joint Director. Worked with various departments of CPRI. Setup Insulation Lab & developed Indigenous Electrical Grade Paper; Setup Polymer Lab and developed PVC granules suitable for 11KV Cable; Took training on TNA (Transient Network Analyzer) at CESI – Italy – 1986; Setup Calibration Lab & Accredited to NCTCF & NABL Norms; As a Technical Assessor assessed calibration Laboratories; Soil Resistivity & Ground Resistance measurement of Large Grounding system of AC/DC stations in various parts of this country; Measurement of Surface Potentials (Mesh, step & touch Potentials) of Large Grounding systems by injecting high current through the Grounding system; Identified suitable land for DC Ground Electrode at Talcher & Kolar, the longest HVDC Transmission Line in Asia between Talcher & Kolar. As a faculty delivered number of lectures & demonstration on "Power system Grounding & Calibration of Electrical Measuring instruments" at various forums in the country.



Shri Nihar Raj

Shri Nihar Raj is the Assistant Vice President - Technical, ABB Ltd. Shri Nihar S. Raj was born in Vadodara. He received his engineering degree from M.S. University Vadodara. Since 2001 he is working with ABB Ltd, substation design department. He has designed several air & gas insulated substations ranging from 11kV to 400kV. He is also involved for design of 800kV AIS. His area of expertise includes Power Systems & Substation Design. He is life member of Society of Power Engineers (Vadodara Chapter) & has presented several technical papers at various national level conferences.



Shri V. Venkatesh

Shri V. Venkatesh is B. Tech (Electrical & Electronics Engg.) from JNTU College of Engineering, Kakinada (A.P). Presently he is Deputy General Manager (PE-Electrical), NTPC Ltd., Noida. He Joined NTPC in 1985 as EET. Posted at Vindhyaachal Super Thermal Power Station, Sidhi Dist. M.P. Worked in Testing, Commissioning and Maintenance of 210MW and 500MW Generators and Excitation System, EHV Transformers, HT / LT Switchgears and Battery System from 1986 to 2006. Posted in Corporate Engineering division from 2006 till date. In the year 1994-95, received CBIP Young Engineers Award.



Shri K.K. Sarkar

Shri K. K. SARKAR is B. Tech (Hons.) in Electrical Engineering (1995) from Indian Institute of Technology, Kharagpur. Since joining as executive trainee in 1995 he is with POWERGRID serving mostly in corporate substation engineering division and is presently Deputy Chief Design Engineer at POWERGRID. He is mainly involved in design, engineering and standardization of substation layout & equipments at voltage levels of 11 kV, 33 kV, 66 kV, 110 kV, 132 kV, 220 kV, 400 kV and also trained from Canada in 800 kV substation design. He has wide experience in designing of earthing system at difficult conditions and has published paper on earthing system.



Central Board of Irrigation & Power

An ISO 9001 : 2008 Organization

No. 1-1000 /Power/Wks/Earthing 2012

Dated 9th August 2012

To

All Concerned

Sub: Interactive Workshop on "Earthing Systems" on 17-18 September 2012 – CBIP Conference Hall, New Delhi - Request for nominations - reg.

Dear Sir,

Central Board of Irrigation & Power with the aim to disseminating the latest technological developments & innovations in the field is organizing an Interactive Workshop on "Earthing Systems" on 17-18 September 2012 at Conference Hall, CBIP Building, Malcha Marg, New Delhi 110021.

Following renowned experts are going to make presentation the Workshop:

<ul style="list-style-type: none">• Shri Mata Prasad, Founder President CIGRE India• Prof. H.R. Seedhar, HOD (Retd.), PEC, Chandigarh	<ul style="list-style-type: none">• Shri S.K. Ray Mohapatra, SE/Director, North Eastern Regional Power Committee, CEA.• Mr. Arunabha Basu, Vice President and Head (Technology), NDPL
<ul style="list-style-type: none">• Ms. Anjali Chandra, Executive Director – Engineering, Delhi Electricity Regulatory Commission	<ul style="list-style-type: none">• Shri Nihar Raj, Assistant Vice President - Technical, ABB Ltd.• Shri H. Jayakumar, Former Jt. Director, CPRI
<ul style="list-style-type: none">• Shri Sonjib Banerjee, Technical Director - Duval Messien, France and Manav Energy Pvt. Limited	<ul style="list-style-type: none">• Shri K.K. Sarkar, Chief Design Engineer, POWERGRID• Shri Sujeet Mishra, Director, RDSO

The topics for Workshop as mentioned in the Information Bulletin have been identified keeping in view the present-day scenario and we are sure that the deliberations during workshop will go a long way in updating the knowledge of participants and they will have an excellent opportunity to interact and exchange their views.

The major attraction of this workshop is a Special Two hour laboratory practical session on the use of the software for evaluation of grid current and two layer soil model being arranged to make participants conversant with the use of software.

We seek your kind cooperation in making the event successful and request you to kindly arrange to nominate a few officers from your organization to participate in the Workshop. The registration fee for attending the workshop is Rs. 10,000/- per participant (Rs. 9000/- for CBIP and AARO member) Service Tax 12.36% extra. The fee is to be sent through DD/Cheque in favour of 'Central Board of Irrigation & Power', payable at Delhi.

Thanking you,

Yours faithfully

V.K. Kanjlia
Secretary

DA: As above