6th National Conference on

Earthing Systems

19-20 September 2013

(Thursday & Friday)

Venue: Conference Hall of CBIP, Malcha Marg, Chanakyapuri, New Delhi

Organised by

Central Board of Irrigation & Power

In association with

International Association on Electricity Generation, Transmission and Distribution (Afro-Asian Region)

Sponsored by

Manav Energy Pvt. Ltd.

marconite earth enhancing aggregate
James Durrans Group - South Yorkshire U.K.
**INTRODUCTION**


**AIMS AND OBJECTIVE**

CBIP has been organizing conferences on earthing of electric power stations every year now. The last one was held in September 2012 which was much appreciated by delegates who had come from all over India and abroad. Since, we have received the numerous requests from various stakeholders to organize another conference on this subject and in view of the pressing demand, CBIP has again taken initiative to organize this National Conference on “Earthing Systems” on 19-20 September 2013 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 conference 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 conference.
- 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 conference 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 Conference.

Shri Mata Prasad, Founder President CIGRE India,
Dr. Hans R. Seedher, Ex Professor & Head, Electrical Engineering Department, Punjab Engineering College,
Ms. Anjuli Chandra, 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, NERPC/Central Electricity Authority,
Shri Nihar Raj, Assistant Vice President, ABB Ltd.,
Shri Arunabha Basu, Vice President and Head (Technology), Tata Power Delhi Distribution Ltd. and
Shri K.K. Sarkar, Chief Design Engineer, Power Grid Corp. of India Ltd.

**DATES AND VENUE**

The Conference will be held on 19-20 September 2013 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 2013.

WHO SHOULD ATTEND

The conference 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 conference may register themselves by sending the following details to CBIP along with necessary payments:
Delegate Name: _______________________________
Designation: ___________________________________
Organisation: _________________________________
Mailing address: _______________________________
Phone/Fax/E-mail: _______________________________

<table>
<thead>
<tr>
<th>Registration fee per participant</th>
<th>Discounted fee for</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBIP/ CIGRE Members</td>
<td>Participants from SEBs</td>
</tr>
<tr>
<td>Amount</td>
<td>10,000/-</td>
</tr>
</tbody>
</table>

Service Tax : 12.36% extra.
The registration fees includes, working lunch, tea during the programme, a copy of the conference 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:

<table>
<thead>
<tr>
<th>Category</th>
<th>Fee</th>
<th>Delegates free</th>
<th>Colored advt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponsor</td>
<td>Rs. 2,00,000</td>
<td>10</td>
<td>2 pages</td>
</tr>
<tr>
<td>Co-sponsor</td>
<td>Rs. 1,00,000</td>
<td>5</td>
<td>1 pages</td>
</tr>
</tbody>
</table>

PAYMENTS

All payments should be made by cheque at par/Demand Draft drawn in favour of “Central Board of Irrigation and Power”, payable at New Delhi or by transfer the amount to HDFC Bank; Branch & Address: G-3/4, Suryakiran Building, 19 Kasturba Gandhi Marg, New Delhi 110001; Saving Bank Account No: 00031110004411; Branch/RTG/NEFT IFSC: HDFC0000003; MICR Code: 110240001; Swift code: HDFCINBBDEL

ADDRESS FOR CORRESPONDENCE

All correspondences relating to event should be addressed to:
V.K. Kanjlia
Secretary
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
Contact Person : S.K. Batra - M : 9811943812

CBIP’S Manual on Earthing of AC Power Systems

The CBIP has been serving the nation with great distinction as a premier institution for dissemination of knowledge, exchange of professional experiences in the field of power generation (including hydro, thermal, nuclear), transmission and distribution of electricity, renewable energy besides various fields of water resources. CBIP makes this knowledge distribution possible through a variety of modes including organizing seminars and conferences at national and international levels; publication of technical documents like journals, manuals, technical reports, proceedings or guidelines, besides giving training to its professionals. Till date about 1500 publications have been brought out by CBIP.

The manual on ‘Earthing of AC Power Systems’ was firstly published in 2007. To incorporate the latest developments and facilitate the professional engineers associated in the field; this Manual was modified in 2011.

In this Manual a systematic attempt has been made to bring out details relating to Design of Earthing System, Fault current distribution for design of earthing system, special considerations for earthing design under difficult conditions, earthing of electronic equipment in power stations, field measurement of erected earthing system as well as earthing of GIS. This document is outcome of the ceaseless efforts made by each & every member of the Expert Group.
Shri Mata Prasad is an internationally known expert and recipient of 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 and Thermal Power Plants. 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, PGCIIL 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). 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 Guru by PAC World from California USA. Shri Mata Prasad has presented about 116 papers in various Indian and International Journals, Workshops and Conferences.

Dr. H.R. Seedher received the B.Sc. Engg., M.Sc. Engg., and Ph.D degrees in Electrical Engg. from Punjab University, Chandigarh in 1968, 1971, and 1980 respectively. Dr. Seedher joined the teaching faculty of Punjab 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, Punjab University, Chandigarh from June 2004 to May 2007. 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 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.

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 2 companies-SGI Engineers (India) and Manav Energy Pvt. Ltd. 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-stats. He has uniquely combined soil-science, metallurgy and chemical engineering to offer long-term & maintenance free solutions for high resistance and sensitive electrical earthing.

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 11 kV to 400 kV. He is also involved for design of 800 kV 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 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 NTPC Ltd., 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 Tata Power Delhi Distribution Ltd., responsible for distribution of electricity in a significant portion of India’s capital. In NDP, he is responsible for major technology intervention including Smart Grid Initiatives.
All Concerned


Dear Sir,

The Central Board of Irrigation & Power (CBIP) has been serving the nation with great distinction as a premier institution for dissemination of knowledge and exchange of professional experiences in the field of power generation (including hydro, thermal, nuclear) transmission and distribution of electricity, renewable energy besides various fields of water resources. The objective is achieved by the Board through various modes like preparation of Manuals/imparting Trainings and organizing Conferences/Workshops.

With the above aim CBIP is organizing 6th National Conference on "Earthing Systems" on 19-20 September 2013 at Conference Hall, CBIP Building, Malcha Marg, New Delhi 110021.

Following renowned experts have already consented to make presentations during the Conference:

- Shri Mata Prasad, International renowned expert on Power, Founder President CIGRE India
- Dr. H.R. Seedhar, Former Prof. & HOD, Elect. Engg. Department, Punjab Engineering College
- Shri S.K. Ray Mohapatra, Director, Central Electricity Authority
- Shri Sonjib Banerjee, Technical Director - Duval Messien, France and Manav Energy Pvt. Limited
- Shri Sujeeet Mishra, Director, RDSO, Lucknow
- Ms. Anjuli Chandra, Director – Engineering, Delhi Electricity Regulatory Commission
- Mr. Arunabha Basu, Vice President and Head (Technology), NDPL
- Shri Nihar Raj, Assistant Vice President - Technical, ABB Ltd.
- Shri K.K. Sarkar, Chief Design Engineer, Power Grid Corporation of India Ltd.

The topics for Conference as mentioned in the Information Bulletin (attached) have been identified keeping in view the present-day scenario and we are sure that the deliberations during conference 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 conference 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 Conference. The registration fee for attending the Conference is Rs. 10,000/- per participant (Rs. 9000/- for CBIP and AARO member) Service Tax 12.36% extra.

Thanking you,

Yours faithfully

V.K. Kanjlia
Secretary