



भारत सरकार  
विद्युत मंत्रालय  
पूर्वी क्षेत्रीय विद्युत समिति

GOVERNMENT OF INDIA  
MINISTRY OF POWER

EASTERN REGIONAL POWER COMMITTEE



No. ERPC/MS/ 2016-17/

Date: 29<sup>th</sup> March, 2017

FAX MESSAGE NO. 179

To,

As per list enclosed.

**Sub: Training Programme for Protection Engineers of Eastern Region – Venue and Coordinating officers detail**

Sir,

In continuation to our fax message No 142 dated 06.03.2017, it is to inform that ERPC secretariat, in consultation with CESC, is arranging a **training cum workshop on protection related issues** from 3<sup>rd</sup> April to 7<sup>th</sup> April, 2017 at AIPM, CESC Ltd, Kolkata. The training module has been designed basically for entry level engineers in the area of protection of transmission and distribution systems, the same is attached at **Annexure-I**. The exact venue for the training is as given below:

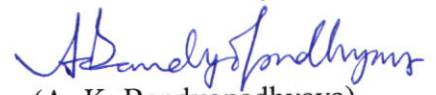
Asia Institute of Power Management  
CESC Limited  
Ground Floor,  
2A, Lord Sinha Road (Opp to A/C Market on Theater Road)  
Kolkata 700071  
Land Mark of the Building (Adjacent to BSF Head Office)

Therefore, you are requested to nominate your entry level officers mainly from protection wings positively by 30.03.2017 to mail: **mserpc-power@nic.in** or by fax (033-2417-1358/1802). **All the participant are requested directly report to AIPM, CESC at the address given above.** The Coordinating officers for the training are as follows:

- 1) **Kamalesh Mukherjee, Asia Institute of Power Management, CESC Limited.**  
M. No. : 8584018526, email: **kamalesh.mukherjee@rp-sg.in**
- 2) **D. K. Bauri, Executive Engineer, ERPC, M. No. 9883617236**  
email: **eeop.erpc@gov.in**

Thanking you.

Yours faithfully,

  
(A. K. Bandyopadhyaya)  
Member Secretary

*Fax Sent  
30/3/17*

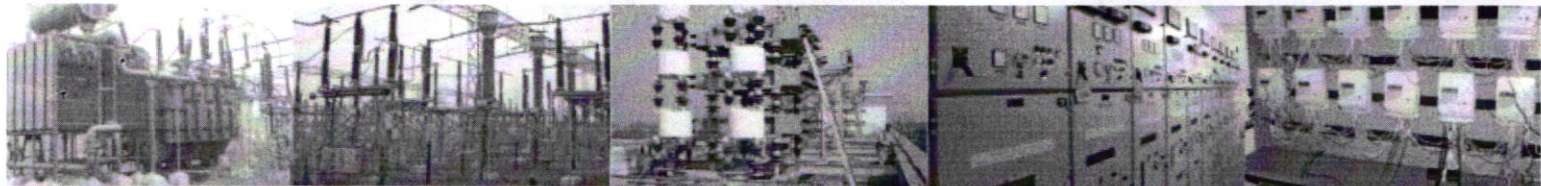
**LIST OF ADDRESSES:**

Chief Engineer, Trans (O&M) BSPTCL, Vidyut Bhawan, Bailey Road, Patna-800021	Electrical Superintending Engineer (CRITL) BSPTCL, Vidyut Bhawan, Bailey Road, Patna-800021
Chief Engineer (SLDC) Damodar Valley Corporation, GOMD-I Premises, P.O.- Danesh Seikh Lane, Howrah- 711109	Chief Engineer (CTC) Damodar Valley Corporation P.O. Maithon Dam, Dist. Dhanbad, Jharkhand-828207
Chief Engineer, (Trans. O&M) JUSNL, Kusai Colony, Doranda, Ranchi-834002	Chief Engineer (SLDC) JUSNL, Kusai Colony, Doranda, Ranchi-834002
Sr. General Manager (PS)/(O&M) OPTCL, P.O. Mancheswar Rly. Colony Bhubaneswar-751017	Chief Load Dispatcher, SLDC OPTCL, P.O. Mancheswar Rly. Colony Bhubaneswar-751017
Sr. General Manager (PPA), Technical Wing, OHPC, Orissa State Police Housing & Welfare Corpn. Bldg. Vanivihar Chowk, Janpath, Bhubaneswar-752022	Addl. Chief Engineer (ALDC) West Bengal Electricity Distribution Company Ltd Vidyut Bhavan, 7 <sup>th</sup> Floor, Bidhannagar, Sector-I Salt Lake City, Kolkata-700091 (Fax-033-2334-5862)
Chief Engineer (Testing), WBSETCL Central Testing Laboratory, Abhikshan, Salt Lake, Kolkata-700091 ( Fax no. 2367-3578/1235 )	Chief Engineer (CLD) WBSETCL, P.O. Danesh Sheikh Lane, Andul Road, Howrah-711109
Sr. Manager (CTMC) Durgapur Projects Limited, Durgapur-713201	Dy. Chief Engineer (Testing)/ Sr. Manager (Testing) CESC Ltd., 4, Sasi Sekhar Bose Road, Kolkata-700025
Dy. General Manager ( Engineering), WBPDC, OS Dept. Corporate Office, 3/C, L.A Block, Salt Lake-III, Kolkata-700098 ( Fax-033-23350516)	Chief Engineer (Trans.) Power Deptt., Govt. of Sikkim, Gangtok-731010
General Manager(OS), ERHQ-I, NTPC Ltd., Loknaya Jaiprakash Bhawan, (2 <sup>nd</sup> Floor), Dak Bunglow Chawk, Patna-800001	General Manager (OS), ERHQ-II, NTPC Ltd., 3 <sup>rd</sup> flr. OLIC Building, Plot no. N 17/2, Nayapalli, Unit-8 Bhubaneswar- 751012 (Fax No. 0674-2540919)
Executive Director (O&M) NHPC Ltd., NHPC Office Complex, Sector-33, Faridabad, Haryana-121003 ( Fax-01292272413 )	General Manager, ERLDC, POSOCO 14, Golf Club Road, Tollygunge, Kolkata-700033
General Manager (OS), ER-I Power Grid Corporation of India Ltd., Alankar Place, Boring Road, Patna-800001	General Manager (OS), ER-II Power Grid Corporation of India Ltd., J-I-15, Block-EP, Sector-V, Salt Lake, Kolkata-91
General Manager (O&M) POWERGRID, Odisha Projects Sahid Nagar, Bhubaneswar – 751 007	

**Copy to:**

1. Executive Director, CESC Limited, CESC House, Kolkata
2. Mr. S. Mukhopadhyay, Asia Institute of Power Management, 2A, Lord Sinha road, Kolkata- 700071





Annexure - I

## ASIA INSTITUTE OF POWER MANAGEMENT

### Training Module on "Operation, Maintenance & Protection of Substation Plants" Combined Training by ERPC with AIPM of CESC Ltd.

#### **DAY 1:**      **3<sup>rd</sup> April 2017**

10.00 -10.15      REGISTRATION

10.15-10.30      INAUGURAL SESSION

- Welcome Address by Member Secretary, ERPC
- Inaugural Address by ED (HR & A), CESC Limited.

10.30-13.00      **Managing Capital Assets**

- Planning of T&D Network with Quality and Reliability
- First Time Right Policy
  - SAIDI, SAIFI in International Benchmark
  - N-1 & N-2 Degree of Reliability
  - Network Planning with Flower, Ring and Butterfly Configuration
  - RMU for Reliability

13.00-14.00      LUNCH

14.00-15.30      **Basic Discussion on Sub-station Equipment and Bus bar Schemes**

- Elements of Sub-station (CT, PT, CVT, Relays, CB, Isolator, LA, Wave Trap etc.)
- Substation Layout
- Basic Power System Protection Components
- Bus bar schemes

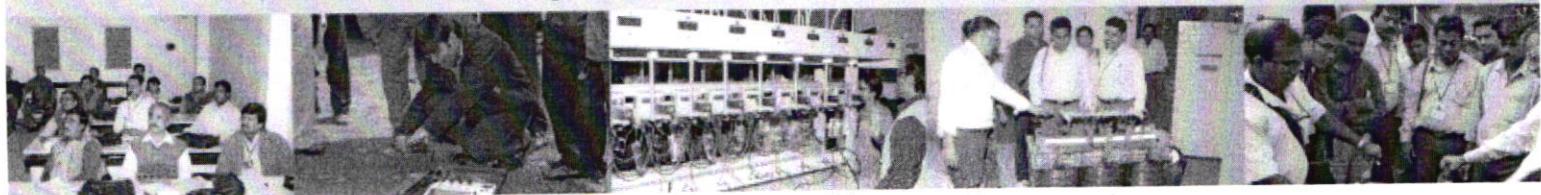
15.30-17.15      **Importance of Power System Protection**

- Need of Protection System
- Fault Characteristics
- Guidelines
- Protection adopted at different voltage levels
- Case studies

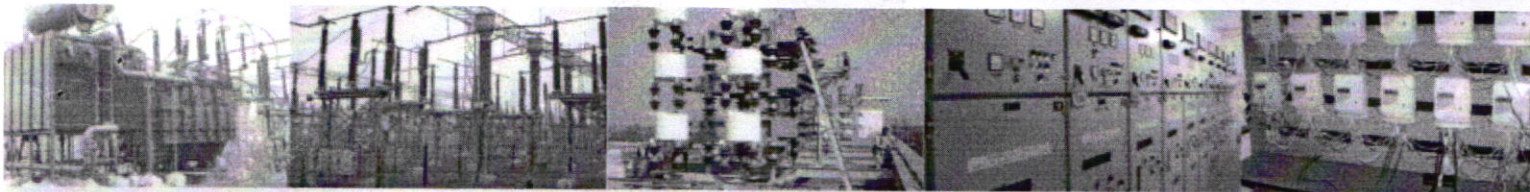
#### **DAY 2:**      **4<sup>th</sup> April 2017**

10.00-11.30      **Discussion on Numerical Relays, Setting & Configuration**

- Introduction on : Required Inputs, Outputs, Connection details
- Digital Signal Processing
- Advantages and Disadvantages
- Numerical relay operating principles
- Settings in numerical distance protection
- Detailed settings of Numerical relays (Distance / OC/ EF)
- Basic inputs required for configuration
- Procedure for Configuration of Numerical relays (Distance / OC/ EF)







- 11.30-13.00      **Concept on Distance Protection**
- Requirement of Distance protection
  - Distance relay characteristics
  - Zone protection philosophy
  - Impedance computation for different types faults
  - Effect of fault resistance
  - Main I and Main II concept

13.00-14.00      LUNCH

14.00-17.00      **Visit to a 220 kV GIS & AIS Sub-station of CESC to see the plants & equipment along with Condition Monitoring practices**

### **DAY 3:**      **5<sup>th</sup> April 2017**

- 10.00-11.30      **Various Protection Schemes and their Philosophy**
- Primary Protection
  - Backup Protection
  - Line Protection
  - Transformer Protection
  - Reactor Protection
  - Generator Protection

- 11.30-13.00      **Sub-station Maintenance Practices & Earthing System of Sub-station**
- Battery selection & Rating
  - Testing & maintenance of batteries
  - Testing of different equipment's earthing, its implications & their disastrous effects
  - Breaker maintenance
  - Isolator maintenance
  - History card of different equipment & their implications
  - Equipment Earthing & its Implications
  - Modern trend of Sub-station Earthing System

13.00-14.00      LUNCH

14.00-18.00      **Visit to 220 kV Tower at Raichak on 400Kv Haldia –Subhashgram Circuit**

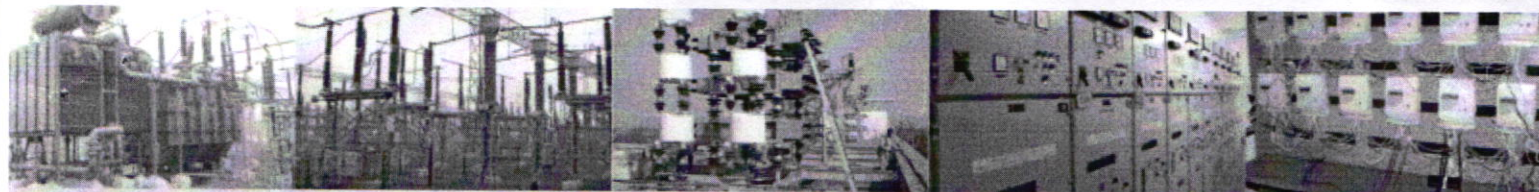
19.00 Onwards      **Networking Dinner**

### **DAY 4:**      **6<sup>th</sup> April 2017**

- 10.00-13.00      **Hands on training**
- Calculation of protection settings
  - Case studies on relay setting calculation and relay coordination







13.00-14.00 LUNCH

14.00-17.00 **Hands on training**

- Case studies on protection coordination
- Analysis of grid disturbances in ER

## **DAY 5:**     **7<sup>th</sup> April 2017**

10.00-11.30 **Protection of Plants**

- Differential Protection
- Restricted E/F Protection
- Over Load / Over Fluxing Protection
- Back-up O/C & E/F Protection
- Other Transformer Protection
- Reactor Protection

11.30-13.00 **Modern Communication System**

- Microwave, Optical Fibre and associated Protection System

13.00-14.00 Lunch

14.00-17.00 **Asset Management to maintain a Reliable System**

- Asset Management Philosophy
  - SOP for Operations & Maintenance
  - Existing Practices
    - A. Time Based Maintenance
    - B. Condition Based Maintenance
- Migration from TBM to CBM**
- DGM
  - Furan
  - PD
  - TEV
  - Thermography
- Mapping and Registration of critical assets with IT support
  - Discussion on DREAMS software

16.30-17.00 **Interactive Sessions**

17.00-17.30 **Feedback**

17.30-18.00

Concluding session, handing over the certificates, memento to all participants

