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GOVERNMENT OF INDIA
विद्युत मंत्रालय
MINISTRY OF POWER
केंद्रीय विद्युत प्राधिकरण
CENTRAL ELECTRICITY AUTHORITY

भार प्रेषकों के प्रशिक्षण और प्रमाणन
एवं
प्रशिक्षण संस्थानों की मान्यता के लिए वैधानिक दिशा निर्देश

Statutory Guidelines for Training and Certification of Load Despatchers

&

Recognition of Training Institutes

January, 2024

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CHAPTER-I

BACKGROUND, OBJECTIVE AND SCOPE

1. **Background:** (1) Real time system operation of an interconnected power system in India is coordinated through the Area, State, Regional Load Despatch Centres and National Load Despatch Centre in collaboration with the generation, transmission and distribution Control Centres. Prompt action by the Load Dispatchers during real time operation as well as a system contingency is vital for the economical, secure and reliable operation of power system. The Control Room of the National, Regional, State and Area Load Despatch Centres, power plants and other Control Rooms of all regional entities must be manned round the clock by the qualified and adequately trained personnel to ensure reliability and security of the system. Appropriately skilled Load Dispatchers are essential for reliable, safe, secure, stable and coordinated operation of interconnected power system in India given the continuously growing load, generation capacity mix, system expansion and multiple number of entities and licensees. However, a nationwide uniform and coordinated framework for imparting comprehensive and mandatory training to Load Dispatchers is not in place currently.

(2) Therefore, need for a uniform mechanism for Training and Certification of Load Dispatchers from National Load Despatch Centre, Regional Load Despatch Centres, State Load Despatch Centres and Area Load Despatch Centres has been felt. This will ensure standardized dissemination of knowledge and skills to all Load Dispatchers for efficiently and effectively managing the Power System Operations.

(3) The clause (g) of section 73 of the Electricity Act, 2003 mandates **Central Electricity Authority (“CEA”)** to promote measures for advancing the skills of persons engaged in the electricity industry. Accordingly, the provision for training for the personnel engaged in the operation and maintenance of generating stations, sub-stations, transmission lines and distribution systems, Load Despatch Centres have been mandated under the **Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 (hereinafter to be referred as “Safety Regulations”)**. In this regard, the Ministry of Power had directed CEA to suitably review the Safety Regulations 2010 for inclusion of the provisions in respect of hierarchy/level wise mandatory training programmes for load dispatchers and identify essential areas of training with curriculums. Accordingly, the provisions have been made under regulation 9 of the Safety Regulations for mandatory training and certification of the personnel engaged for operation and maintenance at Load Despatch Centres.
2. **Objective:** As per the requirement of regulation 9 of Safety Regulations, the personnel engaged for the operation & maintenance at control rooms of National Load Despatch Centre (NLDC), Regional Load Despatch Centres (RLDCs), State Load Despatch Centres (SLDCs) and Area Load Despatch Centres (ALDCs), shall be required to undergo statutory training from the training institutes recognized by CEA for ensuring safe, secure, reliable and economic operations of the Indian Grid. The objective of these guidelines is to lay down domain, course content, level of training and certification, duration of training, qualifying criteria for certification, terms and conditions for certification, roles

and responsibilities of Certification Agency, Load Despatch Centres, and Central Electricity Authority in the ambit of the Safety Regulations.

- 3. Scope and Applicability:** These guidelines shall be applicable to the personnel engaged for operation, supervision, maintenance and control of the Indian power system at the appropriate Load Despatch Centres related to the real time operation.
- (1) The training institute recognized by Authority for training and certification to the load despatchers shall also impart training to the personnel engaged for maintenance at the Control Room of the Load Despatch Centre including the maintenance of hardware and software of SCADA (Supervisory Control And Data Acquisition) and Communication Systems.
 - (2) These guidelines shall include the criteria for recognition of the training institutes for imparting training and certification to the load despatchers.
 - (3) These guidelines shall include the curriculum to be followed by the training institutes for training and certification of load despatchers for different levels as may be decided from time to time.
 - (4) These guidelines shall include the curriculum to be followed by the training institutes for the training of personnel engaged for maintenance at the Control Room of Load Despatch Centre.
 - (5) These guidelines shall be applicable to National Load Despatch Centre, Regional Load Despatch Centres, State Load Despatch Centres including Area Load Despatch Centres, Certification Agency and training institutes being recognised by the CEA.

4. Terminology:

- 4.1 Personnel engaged in operation and maintenance at Control Room**– The executives in technical functions engaged in real time Control Room shift operations or in offline operations such as Operational Planning, Post-Despatch, Power System Logistics, and Power Market Operations.
- 4.2 Certification Agency**- The Certification Agency shall be the training institute recognised by the Central Electricity Authority.
- 4.3** All the words and expressions used in these guidelines shall have the same meaning as assigned to them in various Regulations notified by the Authority.

5. Statutory Provisions for Training and Certification of the Load Despatchers:

- 5.1** In exercise of the power conferred to the Authority under section 177 read with the section 53 of the Electricity Act, 2003, the Central Electricity Authority vide notification No. CEA-PS-16/1/2021-CEI Division dated 12.06.2023 has notified CEA (Measures Relating to Safety and Electric Supply) Regulations, 2023 which provide for the mandatory training and certification for the load despatchers.

5.2 The regulation 9 of these Safety Regulations, 2023 provide for the training and certification of load despatchers and the mandatory requirement for the recognition of the training institutes by the Authority which is reproduced as under:

“9. Training and Certification of personnel engaged for operation and maintenance at Load Despatch Centres. – (1) *The personnel engaged for operation and maintenance at the control room shall hold degree or diploma in Electrical Engineering or in related trade of Engineering from a recognised institute or university.*

(2) *The Authority shall issue guidelines for the training and certification of personnel engaged for operation and maintenance at control room within six months of the notification of these regulations:*

Provided that the roles and responsibilities of the certification agency, duration and content of the basic and advance certification and training course shall be as specified in the guidelines.

(3) *The certification agency shall be a training institute recognised by the Authority:*

Provided that the Load Despatch Centre shall arrange for training and certification of load despatcher from the certification agency recognised by the Authority as per guidelines issued under sub-regulation (2) of this regulation within six months of their engagement:

Provided further that no personnel shall be engaged as load despatcher without certification:

Provided also that existing employee engaged in Load Despatch Centre shall be trained as per guidelines specified under sub-regulation (2) of this regulation within two years from the date of coming in force of these regulations.

(4) *The training institute shall maintain records of the assessment of load despatcher in electronic form in the format prescribed in guidelines specified under sub-regulation (2) of this regulation and such records shall be made available to the Secretary, Central Electricity Authority on annual basis.*

(5) *The personnel other than the load despatcher engaged in the Load Despatch Centre shall undergo requisite training in their related work in the Load Despatch Centre within six months of their engagement.*

(6) The Load Despatch Centre shall submit the details of certified load despatchers and the training details of the other personnel to Secretary, Central Electricity Authority on annual basis in the prescribed format:

Provided that Appropriate Government may provide suitable incentive to load despatchers on successful completion of training.”

5.3 Accordingly, as per the requirement of sub-regulation (2) of regulation 9 of the Safety Regulations, these guidelines are issued.

5.4 Further, in exercise of the power conferred to the Authority under section 177 read with the section 34 and clause (d) section 73 of the Electricity Act, 2003, the Central Electricity Authority vide notification no. 12/X/STD(GRID)/GM/CEA dated 26.06.2010 has notified the Central Electricity Authority (Grid Standards) Regulations, 2010 which provide for mandatory training and refresher course for the load despatchers. Sub-regulation (3) of Regulation 33 of these Regulations is as under:

“Every Grid operator shall undergo training in real time digital simulator and a refresher course at least once in two years.”

CHAPTER- II

Roles and Responsibilities of Load Despatch Centres

6. The following shall be the roles and responsibilities of the Load Despatch Centres in respect of arranging for the training and certification to their personnel engaged in the operation of Load Despatch Centres:
 - (1) The Load Despatch Centre shall arrange for **Basic Level Training and Certification (“BLTC”)** of personnel engaged in operation at Control Room from the Certification Agency recognized by the Authority within six months of their engagement.
 - (2) The Load Despatch Centre shall arrange for Basic level training and certification of its existing employees engaged in operation at Control Room from the Certification Agency recognized by the Authority before 11.06.2025.
 - (3) The Load Despatch Centre shall arrange for **Advance Level Training and Certification (“ALTC”)** of personnel engaged as load despatcher at Control Room.
 - (4) The Load Despatch Centres shall ensure that only personnel having domain relevant “Active” Basic Level Certification have been engaged for operation at Control Room with effect from 01.01.2026.
 - (5) The Load Despatch Centres shall ensure that at least 50% personnel engaged in operation at Control Room are having “Active” Advance Level Certification with effect from 01.04.2027.
 - (6) The load despatch centre shall arrange for training of the personnel engaged for maintenance at Control Room.
 - (7) The Load Despatch Centres shall ensure the submission of the details of certified load dispatchers and training details of other personnel engaged in O&M to the Secretary, Central Electricity Authority in the prescribed formats given at **Annexure-III** and **Annexure-IV** within 15 days after closing of every Financial Year.
 - (8) The following provisions for providing the incentive to load dispatchers on their successful training and certification shall be followed:
 - (i) The employees of NLDC and RLDCs who acquire the certificate of basic level and of advance level in their respective area of specialization shall be allowed a fixed retainer-ship amount during the validity of such certificate period as per the provisions provided under regulation 33 of Central Electricity Regulatory Commission (Fees and Charges of Regional Load Despatch Centre and other related matters) Regulations, 2019 and the detailed

procedure on methodology of payment of certificate retainer-ship made thereof.

- (ii) The employees of State Load Despatch Centres (SLDCs) and Area Load Despatch Centres (ALDCs) who acquire the certificate of basic level and of advance level in their respective area of specialization shall be allowed a fixed retainer-ship-amount during the validity of such certificate period as per the similar provision as provided at sub clause (i) above , for certification retainer-ship payment in respect of the employees of the State Load Despatch Centres including Area Load Despatch Centres to the extent of payment for certification retainer-ship amount may be decided by the respective State Electricity Regulatory Commission (SERCs)/ Joint Electricity Regulatory Commission (JERCs).

CHAPTER- III
ROLES AND RESPONSIBILITIES OF CERTIFICATION AGENCY

7. The following shall be the roles and responsibilities of the Certification Agency in respect of the training and certification to the personnel working in the Load Despatch Centres:
- (1) The Certification Agency shall be responsible for issuing certificates after completion of the requisite training and successful passing of the qualifying examination by the trainees/Load Despatchers.
 - (2) Every Certification Agency shall adopt the updated course curriculum as mentioned in these guidelines within 6 months as and when issued by the Authority.
 - (3) The Certification Agency shall ensure that the duration for training shall be in accordance with duration specified in these guidelines.
 - (4) The process of conducting examination and issuance of certificate shall be completed within two weeks after completion of training by the training institute.
 - (5) The Certification Agency shall ensure fair and transparent examination and assessment process for certification. The recognition of Certification Agency shall be cancelled, immediately, in case of non-compliance of fair and transparent examination and certification process.
 - (6)The Certification Agency shall secure the recording of examination for at least one year and shall provide to the Authority as and when sought.
 - (7)The Certification Agency shall issue individual certificates to all successful trainees on the basis of the qualifying examination. The duration of validity for the certification shall be clearly indicated in the Certificates issued.
 - (8) The Certificate numbers issued to the each trainee must be unique.
 - (9)The Certification Agency shall be responsible for preparing annual training and certification schedule. It shall ensure that sufficient number of training programmes and certification exams are organized in a year and shall prepare an annual calendar at the start of every financial year. This calendar shall be circulated to all the Load Despatch Centres and uploaded on their website on or before 15th April of every financial year so that they can plan and schedule training and certification of their employees.
 - (10) The Certification Agency shall maintain question banks on the basis of course curriculum for each training course for the personnel engaged in operation and maintenance at Control Room in consultation with the Central Electricity Authority and experts from the relevant fields.
 - (11) The question banks of the Certification Agency shall be reviewed by the Central Electricity Authority annually in order to ensure that the level of examination for the Certification Agency is uniform and up to the mark.

- (12) Other mechanisms associated with training and certification including pattern of examination, registration/ application fees, timelines for registration/ application and examination, examination centre regulations, examination frequency, examination venue, withdrawal from examination, maintaining records, confirmation of credentials to third parties, dispute resolution process, disciplinary action and other related matters shall be finalised by the Certification Agency in consultation of the Authority.
- (13) The Certification Agency shall maintain database of the assessment of load despatchers in electronic format. The layout of the format in which the details are to be maintained is given as **Annexure-V**.
- (14) The records of the assessment of load despatchers shall be furnished by the training institutes to the Secretary, Central Electricity Authority within 15 days after closing of every Financial Year.

CHAPTER- IV

FRAMEWORK FOR TRAINING AND CERTIFICATION, RECOGNITION OF TRAINING INSTITUTE BY THE AUTHORITY

8. Training and Certification Framework for the Personnel Engaged in Operation and Maintenance at Control Room:

- (1) Depending on the roles and responsibilities of personnel engaged for operation and maintenance at Control Room, the training has been envisaged in the domain of Power System Operation (for Load Despatchers).
- (2) The hierarchy/ level wise training and certification shall be at two levels, namely: -
 - (a) Basic Level Training and Certification (“BLTC”), and
 - (b) Advance Level Training and Certification (“ALTC”)
- (3) For obtaining “Advance Level Certification”, an “Active” Basic Level Certification is mandatory.
- (4) These Training and Certification programmes shall be organized by the Certification Agency

8.1 Basic Level Training and Certification – (1) The Basic Level Training and Certification shall be mandatory for all the personnel engaged in operation and maintenance at Control Room.

- (2) The duration for the Basic Level Training and Certification shall be of three weeks.
- (3) The Basic Level Training and Certification shall be followed by the mandatory qualifying examination with minimum passing percentage of 65%.
- (4) The Basic Level Training and Certification shall be mandatory for personnel engaged in operation and maintenance at Load Despatch Centres with effect from 01.01.2026.
- (5) A candidate appearing for the Basic Level Training and Certification examination shall hold a degree or diploma in Electrical Engineering or in related trade of Engineering from a recognized Institute or University and shall be an employee of Load Despatch Centre and shall have completed three weeks’ mandatory Basic Level Training as per the content and course specified in these guidelines.
- (6) The qualifying examination for Basic Level Training and Certification shall be conducted by the Certification Agency recognized by the Authority or shall be conducted by an independent agency engaged by the Certification Agency.

- (7) The Basic Level Training Certificate issued by the Certification Agency shall be valid for three years.
- (8) The Basic Level Certification shall be renewed every two years after undergoing Basic Level Refresher course:
 - (i) The training of Basic Level Refresher Course can be done at the CEA recognized institutes or in-house at the load despatch centre as per the curriculum given in these guidelines.
 - (ii) After completing the Refresher Course of one week duration, the load despatcher shall undertake the mandatory qualifying test with minimum qualifying score of 60% to be conducted by the Certification Agency based on the content of the Refresher Course.
 - (iii) The Certification Agency shall conduct the all-India examination for the Refresher Course.
 - (iv) The content of Refresher Courses for renewal of Basic level Certification shall be issued separately by CEA.

8.2 Advance Level Training and Certification – (1) The course content of Advance Level Training and Certification shall have the following areas or in such areas as may be specified under these guidelines from time to time:

- (i) Power System Reliability
 - (ii) Power System Operation and Regulatory Framework in Power Sector
 - (iii) Power Market
 - (iv) Renewable Energy (RE) Sources and Grid Integration
 - (v) Power System Logistics
- (2) For Advance Level Training and Certification, training shall be mandatory in the area of Power System Reliability and, in addition, any one of the areas of Load Despatch out of the above mentioned remaining four areas.
 - (3) The duration of Advance Level training shall be of 2 weeks followed by mandatory qualifying examination with minimum qualifying score of 65%.
 - (4) A Load Despatcher appearing for Advance Level Certification examination shall have “Active” status of Basic Level Training Certification and shall have put in at least 3 years of service in Load Despatch Centre.
 - (5) More than one Advance Course may also be undertaken by a Load Despatcher as per the requirement.
 - (6) The qualifying examination for Advance Level Training and Certification (ALTC) shall be conducted either by the Certification Agency recognized by the Authority or by an independent agency engaged by the Certification Agency.

- (7) In case a load despatcher having an active Advance Level Certification in one specialized field is transferred to any other specialized field, he/she shall obtain the Advance Level Certification corresponding to that field within two years of such transfer/posting.
- (8) The Advance Level Certification shall be valid for 3 years and shall be renewed every two years after undergoing Advance Level Refresher course.
 - (i) The duration of Advance Level Refresher course shall be one week.
 - (ii) The training of Advance Level Refresher course can be done at the CEA recognized institutes or in-house at the load despatch centre following the curriculum given in these guidelines.
 - (iii) The qualifying examination shall not be mandatory after completion of the Refresher Course.
 - (iv) After the completion of the refresher course, a certificate shall be issued by the institute/Load Despatch Centre and same shall be treated as renewal certificate
 - (v) The content of Refresher Courses for renewal of Advance level Certification shall be issued separately by CEA.

9. Validity of Certification:

- (1) The Basic Level Training Certification (BLTC) shall be valid for a period of 3 years from the date of issuance of the certificate.
- (2) The candidates shall be required to renew their Basic Level Training Certification (BLTC) before expiry of the certification.
- (3) The Basic Level Training Certification (BLTC) must be “Active” at all times in order to work in Load Despatch Centre.
- (4) The Advance Level Certification shall be valid for 3 years and shall be renewed every two years by undergoing the Advance level Refresher Course.

10. Procedure for Recognition of Training Institute by the Authority: As per the requirement of the sub regulation (3) of Regulation 9 of Safety Regulations, the certification agency shall be a training institute recognized by the Authority. Accordingly, the undermentioned procedure shall be followed for recognition of the training institute by the Authority.

10.1 Application by the Training Institute for Fresh Recognition:

- (1) The training institute shall apply to the Authority, furnishing the required information, for its recognition in the prescribed format enclosed (**Form A**), for last financial year, in these guidelines.
- (2) The requisite fee for application for fresh recognition shall be levied on the training institute. The details regarding payment of fees shall be as per the fee schedule issued by the Central Electricity Authority time to time.

- (3) On receipt of the complete application with information specified above, CEA shall examine the eligibility of the same and if the application is found to be eligible for recognition by Authority, the institute shall submit the above-mentioned fee to Authority for processing the application for recognition.
- (4) After receipt of the Application specified above, the Central Electricity Authority officer(s) will make an assessment on the various aspects in accordance with laid down criteria/norms as specified in these guidelines by visiting the institute on a mutually agreed date.
- (5) The following shall be the mandatory requirements for the training institute for training and certification of personnel of Load Despatch Centres:
 - (i) There shall be a separate building which shall be solely used for the purpose of training. The building shall either be owned by the institute or on lease. However, in case the building is on lease then the lease period shall be more than the period of recognition.
 - (ii) The training institute shall have the facilities of providing training on simulator and offline simulation tools such as Power System Simulation for Engineering (PSSE), Power Systems Computer Aided Design (PSCAD) etc. and for slide shows & multimedia. The training institute shall have institutional tie up for simulator training/labs/workshops, if not having in-house.
 - (iii) The training institute shall have a full time Principal/Director and teaching staff.
 - (iv) The training institute shall give an undertaking that on recognition for 3 years initially, the institute shall follow the curriculum as per these guidelines.
 - (v) The training institute shall score at least 65% in the evaluation criteria for getting its recognition from the Authority.
 - (vi) The training institute shall have CCTV facility at the examination hall for conducting the certification exam. The training institute may have tie up with independent agency for conducting the exam which shall have CCTV facility at the examination hall for conducting the exam.
 - (vii) The institute shall have at least 5 number of servers of latest configuration and loaded with one simulation tool for steady state and transient analysis of balanced system and one for Electromagnetic Theory (EMT) studies with ability to model individual phases of the Power System, besides other general applications. The training institute shall ensure that each trainee is provided with one terminal at a time and capable of executing all the applications hosted by the servers.
 - (viii) The training institute shall have basic medical facilities and high speed Internet facilities in its premises.
 - (ix) The Budget provision and control of expenditure for training program shall be distinctly and exclusively earmarked for the training institute.

10.2 Application by the Training Institute for Renewal of Recognition

- (1) The training institute shall apply four months before the expiry of the earlier recognition to the Authority for the renewal of recognition furnishing the required information for last three financial years separately in the prescribed format enclosed (**at Form B**) in these guidelines.
- (2) The requisite fee for application for renewal of recognition of training institute shall be levied from the training institute. The details regarding payment of fees shall be as per the fee schedule issued by the Central Electricity Authority from time to time.
- (3) On receipt of the complete application with information specified above, CEA shall examine the eligibility of the same and if the application is found to be eligible for renewal of recognition by Authority, the institute shall submit the requisite fee to Authority for processing the application for renewal of recognition
- (4) The training institutes applying for renewal of recognition after the expiry of the earlier recognition shall be treated as institute seeking for fresh recognition and shall be charged as that for fresh recognition.
- (5) The training institutes applying for renewal of recognition after the date of expiry of earlier recognition shall not be displayed in the list of training institutes recognized by CEA.
- (6) After receipt of the Application specified above, the Central Electricity Authority officer(s) will make an assessment on the various aspects in accordance with laid down criteria/norms as specified in these guidelines by visiting the institute on a mutually agreed date.
- (7) The following shall be the mandatory requirements for the training institute for training and certification of personnel of load despatch centres:
 - (i) There shall be a separate building which shall be solely used for the purpose of training. The building shall either be owned by the institute or on lease. However, in case the building is on lease then the lease period shall be more than the period of recognition.
 - (ii) The training institute shall have the facilities of providing training on Simulator and offline simulation tools such as Power System Simulation for Engineering (PSSE), Power Systems Computer Aided Design (PSCAD) etc. and for slide shows & multimedia. The training institute shall have institutional tie up for simulator training/labs/workshops, if not having in-house.
 - (iii) The training institute shall have a full time Principal/Director and teaching staff.
 - (iv) The training institute shall have at least 2 faculties (core/empaneled/guest) in relevant specialized topics/subjects of the curriculum given in these guidelines.
 - (v) The training institute shall score at least 65% in the evaluation criteria for getting its recognition from the Authority.

- (vi) The training institute\independent agency conducting the exam shall have CCTV facility at the examination hall for conducting the certification exam. The training institute may have tie up with independent agency for conducting the exam which shall have CCTV facility at the examination hall for conducting the exam.
- (vii) The training institute shall conduct Basic Level Certification Course, Advance Level Certification Course, Basic Level Refresher Course, Advance Level Refresher Course and Maintenance Course as per the curriculum given in these guidelines.
- (viii) The institute shall have at least 5 number of servers of latest configuration and loaded with one simulation tool for steady state and transient analysis of balanced system and one for Electromagnetic Theory (EMT) studies with ability to model individual phases of the Power System, besides other general applications. The training institute shall ensure that each trainee is provided with one terminal at a time and capable of executing all the applications hosted by the servers.
- (ix) The training institute shall have basic medical facilities and high speed internet facilities in its premises.
- (x) The Budget provision and control of expenditure for training program shall be distinctly and exclusively earmarked for the institute

10.3 Application for Recognition (Fresh / Renewal) of Training Institutes with multiple Fields of Training: The Training institute applying for Fresh / Renewal for recognition in more than one field amongst Load Despatch, Generation, Transmission and Distribution and also in more than one category of Institutes (not applicable in case of Load Despatch field) , shall have to follow the following procedure provided that such fields of Training for all the applied categories are available in the Institute at same Location:

- (1) The Institute shall submit the required information in the prescribed format, i.e, in Form A for fresh recognition or Form B for renewal of recognition for each of such fields of training and also for such categories of Institutes as mentioned in the relevant Guidelines of CEA in a single application.
- (2) The Institute shall fulfil all the mandatory conditions and general conditions prescribed in such fields of training as mentioned in the relevant Guidelines of CEA.
- (3) The requisite fee for the fresh / renewal of recognition of training institute shall be levied from the training institute. The details regarding payment of fees shall be as per the fee schedule issued by the Central Electricity Authority from time to time.

- (4) After receipt of the Application specified above, the Central Electricity Authority officer(s) shall make an assessment on the various aspects in accordance with laid down criteria/norms as specified in respective guidelines by visiting the institute on a mutually agreed date.

10.4 Parameters/Criteria for assessment of the Training Institute: The training institute shall ensure that for all the requisite Infrastructure/Faculty/Course content /Budget are available, as far as possible, in their own training institutes.

I. Infrastructure:

Apart from Mandatory condition as mentioned above, it is preferable that the institute shall have following:

- (1) Minimum one classroom, seminar/conference hall/ auditorium, library.
- (2) Separate hostels for men and women with mess or there shall be institutional tie-up with other Institutes/utilities/facilities
- (3) In-house simulator training facilities or there shall be institutional tie-up with other Institutes/utilities.
- (4) In-house Certification Exam Facilities or there shall be institutional tie-up with other Institutes/utilities.
- (5) Facilities for demonstration by static models, training resource unit supported with appropriate reprographic facilities, Audio-Visual training aides including Computer Based Training (CBT) packages, Liquid Crystal Display (LCD)/ Light-Emitting Diode (LED)/Video screen Slide and Overhead projectors, virtual reality, gamification, and e-learning platforms.
- (6) Recreation facilities, transport, Canteen, Laundry.

The training institutes shall ensure that the environment provided to the trainees is proper, clean & hygienic such that conducive environment prevails for the trainees while undergoing training at the institutes.

II. Organization and Staffing:

- (1) The training institute shall have a full time Principal/Director of appropriate level officer as described below:
 - (i) Central Public Sector Undertaking (CPSU) training institute shall be headed by an officer of Executive Director or above.

- (ii) State Sector institute shall be headed by an officer of Superintending Engineer or equivalent.
 - (iii) Private sector institute shall be headed by an officer having degree in Master of Business Administration (MBA)-Human Resource (HR) with relevant work experience of 15 years or more.
- (2) The training institute shall have adequate number of regular in- house teaching staff in the field of load despatch in addition to the external faculty depending upon the scope and magnitude of the training institute.
 - (3) During the training period, the trainees shall be under the administrative control of the head of the training institute.

III. Faculty:

- (1) The faculties of the training institute shall have experience of minimum 5 years in the relevant functional areas of load despatch. Core faculty shall also have undertaken at least one week training from an institute with all-India recognition (such as National Institute of Technology (NIT) or Indian Institute of Technology (IIT)) in their domain of knowledge at least once a year.
- (2) The faculty shall be familiar with latest instructional techniques and apply innovative means for administrating the training inputs.
- (3) The faculties getting salary from allocated budget of training institute shall be considered as core faculty of the training institute.
- (4) Besides Core Faculty, the training institutes may empanel faculties with relevant experience in load despatch for delivering lectures/imparting knowledge using simulator.
- (5) Empaneled Faculty of an institute shall consist of the trainers who have delivered at least five lectures in a year in the institute.
- (6) The external (Guest) faculty shall be specialized in the subject with adequate experience on the topic in which lecture has to be delivered.

IV. Training Methodology:

- (1) Training shall be imparted in Classroom through lectures and talks of eminent speakers, group discussion in conference hall, visits to control room, simulator and on job training.
- (2) The minimum batch size for any classroom training programme is 10 for considering the respective training programme in the evaluation process.

V. Training programs:

- (1) The training institute shall prepare an annual training program calendar based on training need analysis of its own organization or for meeting the requirement of other utilities of Power Sector.
- (2) The training calendar shall include basic & advance course and refresher courses as outlined in these CEA guidelines.

VI. Certification Exam: There shall be two types of certification examination one for the basic course and other for the advance course:

- (1) The certification exam shall be based on model question banks based on the curriculum contained in these guidelines and prepared by the Certification Agency.
- (2) After undergoing basic/ advance course training, the trainee shall have to successfully pass the certification exam.
- (3) The Certification examination shall be conducted under CCTV surveillance to make it fair and transparent.
- (4) For load despatcher the overall passing marks for basic level and advance level certification shall be 65%.
- (5) The format for certificate issued on successful completion of the training is given at **Annexure-VI**

10.5 Criteria/Norms for Recognition and Grading of Training Institute:

- (1) Recognition and Grading of Institutes shall be made based on the information furnished by Institutes for last financial year in the Application **Form A** and assessment by the assessing officers of CEA.
- (2) The weightage and norms for each parameter/activity for appraisal shall be as under for last financial year:

S.No		Max. Score	Score				remark
			(a)	(a*1)	(a*0.7)	(a*0.4)	
1.	Infrastructure						
(1)	No. of Classrooms	5	≥ 3	2	1	0	Minimum one classroom
(2)	E-Library	2.5	Yes			No	e-Library shall have Journals and relevant

							Technical Standards etc.
(3)	No. of Multi Media Packages	2.5	>=20	>10	>0	0	
(4)	Simulator (Own/Tie-up)	2.5	Yes			No	
(5)	Hostel and Canteen	2.5	Excellent	Very Good	Good		
(6)	Quality of Infrastructure	15					
(i)	Maintenance	2.5	Excellent	Very Good	Good		
(ii)	Air-conditioning	2.5	Yes			No	
(iii)	Cleanliness/ Hygiene	2.5	Excellent	Very Good	Good		
(iv)	No. of Facilities (Transport, Laundry, Gym, Indoor/Outdoor Sports)	2.5	>=3	2	1	0	
(v)	High Speed Internet	2.5	Yes			No	
(vi)	Medical facilities (First Aid/On-call Doctor/ Nursing Room/ Basic Medicines etc.)	2.5	Excellent	Very Good	Good	No	
	Sub Total	30					
2.	Faculty (Core +Empaneled + Guest)						
(1)	Qualification of Faculty	10	(No. of Ph. D*10+No. of PG*9+No. of Graduates*8) /Total(Core+ empaneled+ guest) faculties				
(2)	Experience of Faculty	10	(No. of Faculty having experience more than 10yrs *10 + No. of Faculty having exp. more than 5yrs*5)/Total (Core+ empaneled+ guest) faculties				
(3)	Ratio of (core+ empaneled) to (Core+ Empaneled+ Guest) (in %)	5	>=60	41-59	20-40	<20	
(4)	Training of Core Faculty (in % of total Core Faculties)	5	>=80	60-79	40-59	<40	Training of no. of Core Faculties

(5)	No. of Papers Published in conference or seminars by core faculties and No. of core faculties empaneled with other institutes	2.5	≥ 3	2	1	0	
(6)	No. of Membership of National or International body of the training institute and No. of working models or simulation models made by core faculties	2.5	≥ 3	2	1	0	
	Sub Total	35					
3.	Course						
(1)	Total Courses conducted relevant to Power Sector (Days)	15	≥ 100	60-99	10-59	<10	
(2)	Total simulator days (in % of total courses conducted in days)	10	≥ 1	≥ 0.6	≥ 0.1	<0.1	
	Sub Total	25					
4.	Utilization of Annual Budget	10	≥ 80	60-79	40-59	<40	
	Grand Total	100					

- (3) The institute seeking for fresh recognition shall furnish the above-mentioned required information , for evaluation , for last financial year. In case of non-furnishing of information against any parameter or its part by the institute, zero score will be awarded against that parameter.
- (4) In case of fresh recognition, if the score obtained on evaluation by the training institute is at least 65, then the training institute shall be recognized for duration of 3 years. The institute shall give an undertaking that curriculum mentioned in these CEA guidelines shall be followed by the training institute **for at least next 3 years.**
- (5) Based on the recommendations of the assessing team visiting the training institute, the observations/recognition of the institute shall be communicated to the head of organization/ training institute.

- (6) CEA Officer(s) may visit the institute any time after granting the recognition to review the action taken on CEA observations and the progress of improvement in the Standard of the training institute. In case the deficiency with regard to the information submitted to the CEA in Form-A and any non-compliance of the observation made by CEA, the recognition of the training institute may be withdrawn by the Authority after issuing the notice to training institute for removal of the deficiency of the compliance of the observation within 60 days and by giving the opportunity for the training institute to be heard before the CEA.
- (7) The effective date of the Recognition of the new Training Institute shall be from-the date of issuing letter to the training institute communicating the recognition.
- (8) The recognized training institutes shall update the data annually on the online portal developed by the CEA

10.6 Criteria/Norms for Renewal of Recognition and Grading of Institute:

- (1) Recognition and Grading of Institutes shall be made based on the information furnished by Institutes for last three financial years separately in the Application **Form B** and assessment by the assessing officers of CEA.
- (2) The weightage and norms for each parameter/activity for appraisal shall be as under for last three financial years separately:

S.No		Max. Score	Score				remark
			(a)	(a*1)	(a*0.7)	(a*0.4)	
1.	Infrastructure	30					
(1)	No. of Classrooms	5	>=3	2	1	0	Minimum one classroom
(2)	E-Library	2.5	Yes			No	E-Library shall have Journals and relevant Technical Standards etc.
(3)	Multi media Packages	2.5	>=20	>10	>0	0	
(4)	Simulator (Own/Tie-up)	2.5	Yes			No	
(5)	Hostel and Canteen	2.5	Excel lent	Very Good	Good		

(6)	Quality of Infrastructure	15					
(i)	Maintenance	2.5	Excellent	Very Good	Good		
(ii)	Air-conditioning	2.5	Yes			No	
(iii)	Cleanliness/ Hygiene	2.5	Excellent	Very Good	Good		
(iv)	No. of Facilities (Transport, Laundry, Gym ,Indoor/Outdoor Sports)	2.5	≥ 3	2	1	0	
(v)	High Speed Internet	2.5	Yes			No	
(vi)	Medical Facilities (First Aid/On-call Doctor/ Nursing Room/ Basic Medicines etc.)	2.5	Excellent	Very Good	Good	No	
	Sub Total	30					
2.	Faculty (Core +Empaneled + Guest)						
(1)	Qualification of Faculty	7.5	(No. of Ph.D.*7.5+No. of PG*6+No. of Graduates*4)/Total(Core + Empaneled + Guest Faculties)				
(2)	Experience of Faculty	7.5	(No. of Faculty having experience more than 10yrs *7.5 + No. of Faculty having exp. more than 5yrs*5)/Total (Core+ Empaneled+ Guest Faculties)				
(3)	Ratio of (Core+ Empaneled) to (Core + Empaneled + Guest) (in %)	5	≥ 60	41-59	20-40	<20	
(4)	Training of Core Faculty (in % of Total Core Faculties)	5	≥ 80	60-79	40-59	<40	Training of no. of Core Faculties
(5)	No. of Papers Published in conference or seminars by core faculties and No. of core faculties empaneled with other institutes	2.5	≥ 3	2	1	0	
(6)	No. of Membership of National or	2.5	≥ 3	2	1	0	

	International body of the training institute and No. of working models or simulation models made by core faculties						
	Sub Total	30					
3.	Course						
(1)	Total Basic Courses conducted (Days)	7.5	≥ 45	21-44	15-20	<15	
(2)	Total Advance courses conducted (Days)	5	≥ 30	20-29	10-19	<10	
(3)	Total Refresher courses conducted (Days)	2.5	≥ 30	20-29	10-19	<10	Basic Refresher Course and Advance Refresher Course
(4)	Total Maintenance courses conducted (Days)	2.5	≥ 15	11-14	6-10	<5	
(5)	Total simulator Training days (% of total days (i.e.1+2+3+4))	2.5	≥ 1%	>0.5%	≥0.1 %	<0.1 %	
(6)	Average score obtained in Basic Certification under CCTV surveillance	5	Average percentage Score /20				
(7)	Average score obtained in Advance certification exam under CCTV surveillance	5	Average percentage Score /20				
	Sub Total	30					
4.	Utilization of Annual Budget	10	≥80	60-79	40-59	<40	
	Grand Total	100					

- (3) The institute seeking for renewal of recognition shall furnish the above-mentioned required information for evaluation for last three financial years. In case of non-furnishing of

information against any parameter or its part by the institute, zero score will be awarded against that parameter.

- (4) The overall grading of the training institute shall be given on the basis of computation of the overall score based on yearly scores for a three-year period prior to the expiry of the validity of the certificate. The weightages for the three years shall be 0.5, 0.3 and 0.2 respectively.

(Example: If the validity of the recognition certificate is expiring on 30.6.2023, then three years under consideration will be 2022-23, 2021-22 & 2020-21 having weightage of 0.5, 0.3 & 0.2 respectively)

- (5) The training institute shall be graded and recognized thereof for the period as under:

Score Obtained	Grading	Rating	Period of Recognition
>79	A	Excellent	5 years
65-79	B	Very Good	4 years
< 65	—	Not qualified	—

- (6) Based on the recommendations of the assessing team visiting the training institute, the observations/recognition of the institute shall be communicated to the head of organization/training institute.
- (7) CEA Officer(s) may visit the institute any time after granting the recognition to review the action taken on CEA's observations and the progress of improvement in the Standard of the training institute. In case the deficiency with regard to the information submitted to the CEA in Form-B and any non-compliance of the observations made by CEA, the recognition of the training institute may be withdrawn by the Authority after issuing the notice to training institute for removal of the deficiency of the compliance or for the observation within 60 days and by giving the opportunity for the training institute to be heard before the CEA.
- (8) In case the training institute has applied for renewal of certificate of recognition within the stipulated time under these guidelines and submitted the requisite fee for recognition after the necessary scrutiny of the application by CEA and the physical assessment of the institute by CEA officer(s) has not been done before expiry of certificate of recognition, then the renewal of training institute shall be done from the next day after expiry of the validity period of the certificate of recognition.
- (9) The recognized training institutes shall update the data annually electronically or through the online portal.
- (10) CEA team may visit the institute any time after granting the recognition to review the action taken on CEA's observations and the progress of improvement in the Standard of the institute.

10.7 Cancellation of Recognition

- (1) The recognition of any training institute shall stand cancelled automatically due to the following reasons: -
 - (i) Change in the ownership of the institute by sale or transfer of the institute.
 - (ii) Change / shift in the location of the institute.
- (2) In case of cancellation of recognition due to any reasons as stated above, the institute may apply for its recognition as in the case of a fresh recognition.

10.8 Regular updation of Syllabus:

- (1) The curriculum given in the guidelines shall be updated by the same sub-committee constituted for finalization of the guidelines in the field of Load Despatch vide office order no. 13/2/2023-HRD/1445-66 dated 31.05.2023. The expert committee constituted vide office order no. 13/2/2022-HRD/933-944 dated 27.7.2022 shall review the recommendations of the sub-committee and finalize the same for approval of the Authority.
- (2) The periodicity for updation of syllabus shall be at least once in three years. However, in case of need, the syllabus may be revised at any time.

CHAPTER- V

CURRICULUM FOR O&M PERSONNEL OF LOAD DESPATCH CENTRES

I. Curriculum for Basic Level Certification for Load Dispatchers:

A. Curriculum for First Phase of Basic Level Certification:

(i) General (Introductory-In brief relevant to grid operation)

- (a) Roles and Responsibilities for Power system Operators, Policies and Legal Frame Work
- (b) Ring Fencing of System Operation
- (c) Electricity Act, 2003
- (d) Relevant Legal framework, Policies, Regulations and Standards
- (e) Indian Electricity Grid Code (IEGC) and Energy Conservation Act.
- (f) Central Electricity Authority (CEA) Grid Connectivity Standards, Grid Standards, Safety Regulations & Communication Regulations/Standards.
- (g) Institutional Arrangement for governance of energy sector in India

(ii) System Operation (Relevant to Load Dispatcher)

- (a) Resource Adequacy and Load Generation Balance
- (b) Generation through Thermal, Hydro, Nuclear, Gas, Renewable Power Plant and their Operation Characteristic- Startup, Shutdown and Emergency response, ramp rate.
- (c) Grid Access & Integration of new entities including RE, Introduction of RE in India Challenges faced in Grid operation, Operations of REMCs.
- (d) Black Start and System Restoration
- (e) Overview of Extra High Voltage Alternating Current (EHV AC) Systems/ High-Voltage Direct Current (HVDC) Systems
- (f) Frequency Control, Primary Control, Secondary Control, Tertiary Control, FGMO
- (g) Reactive Power Management
- (h) Transmission Line Charging Operational Aspects, Power Quality
- (i) Over View Of Power System Protection , Line Protection and Fault Clearance (relevant to grid operation for e.g. time required for rectification of fault in Transmission line)
- (j) Protection Zones, Generator Protection (protection from Motoring Mode), Classification of Protection Relays
- (k) Overview on PMU, Smart grid operations (relevant to load despatch operation)
- (l) Power flow simulation, fault studies, stability studies

- (m) Importance of Total Transfer Capability (TTC)/ Available Transfer Capability (ATC) computation
- (n) Elementary concepts of Unit Commitment (UC) & Economic Despatch (ED), Security Constrained Unit Commitment (SCUC) & Security Constrained Economic Despatch (SCED) and their importance in system operation
- (o) Resource Adequacy (RA) concepts – its importance in operational and long term planning. Common metrics used for measuring RA, procedure for estimating RA as per CEA guidelines
- (p) Concepts of frequency control continuum inertial response and frequency response characteristics computation for control areas; primary, secondary and tertiary controls, Automatic Generation Control (AGC), importance of maintaining reserves in the system and categorization of reserves.
- (q) Categorization of grid events – grid incidents and disturbances. Analysis and reporting of grid incidents and grid disturbances illustrated through case studies.
- (r) Energy management system (EMS) : State Estimation Techniques
- (s) EMS : Load forecasting and Network Study
- (t) Distributor Management Systems (DMS) Overview
- (u) DTS (Dispatcher Training Simulator)-operation
- (v) On job training-posting in control room. (can be scheduled at the end of each phase or at the end of training depending on the requirements of organization)

B. Curriculum for Second Phase of Basic Level Certification:

Market Operation:

- (a) Introduction to Restructuring of Power Industry in India and Learnings from Global Experience.
- (b) Fundamentals of Economics - Consumer behavior, Supplier behavior, Market equilibrium (Fundamentals in brief)
- (c) Philosophy of Market Models (Independent System Operators (ISO / transmission system operators (TSO)/ Independent / transmission system operators (ITSO)/Deep ISO/Shallow ISO models)
- (d) Fundamentals of Market Design (Imbalance, Scheduling and Despatch, Congestion Management and Ancillary Services), Auctions (Introduction to Types and Experiences in Different Jurisdictions)
- (e) Fundamentals of Electricity Market Design in India , Power Market Regulations, Power Exchange Operations
- (f) Scheduling and Despatch: Loss administration, Deviation Settlement, Congestion Management
- (g) Ancillary Services in Indian Electricity Market, Central Electricity Regulatory Commission (CERC) Secondary Reserve Ancillary Services (SRAS) and Tertiary Reserve Ancillary Services (TRAS) Regulations & corresponding procedures

- (h) Point of Connection (PoC) Tariff Philosophy, Transmission Losses, Transmission Charges and Transmission Account, Transmission Pricing and sharing of transmission charges
- (i) First Time Charging (FTC) including Renewable Energy (RE)
- (j) Connectivity, Open Access, National Open Access Registry (NOAR) and Scheduling, Long Term, Medium Term Access and connectivity with Regional and State Perspective, GNA (General Network Access) and TGNA
- (k) Computation of Tariff under Open Access for a bulk customer in a state: Case Studies
- (l) Interface Energy Metering
- (m) Regional Energy, Unscheduled Interchange (UI) and Reactive Energy Account
- (n) UI & Congestion Charge Regulations
- (o) Terms and Conditions of Tariff Regulations
- (p) Metering & Settlement Principles
- (q) Fundamentals of Electricity Market Design in India, Power exchange operations (IEX, PXI, HPX) and products (DAM, GDAM, RTM and Term Ahead)
- (r) Integration of Renewables, Renewable Energy Certificate and Energy Efficiency Certificate mechanism
- (s) Accounting & Financial Settlement (including SCED, SRAS & TRAS) – Deviation Settlement Mechanism (DSM) and Ancillary (RRAS & AGC) Regulation (including Santulan Report), SCED
- (t) Revenue Stream of Load Despatch Centres
- (u) Regulatory Oversight & Compliance Monitoring
- (v) Power System Development Fund (PSDF) Account and related fundamentals
- (w) DTS (Dispatcher Training Simulator)-
- (x) On job training-posting in control room (can be scheduled at the end of each phase or at the end of training depending on the requirements of organization)

C. Curriculum for Third Phase of Basic Level Certification:

- (a) Power System Real Time monitoring and control, EMS/SCADA, Cyber Security and IT-introduction
- (b) Understanding of weather forecasting, RE Forecasting tools & technique, Scheduling and Renewable purchase obligation (RPO)
- (c) Load pattern due to charging of electric vehicles and installation of energy storage system.
- (d) Cyber Security: General awareness, CEA Guidelines, Role of Computer Emergency Response Team (CERT)-In, National Critical Information Infrastructure Protection Centre (NCIIPC), CERT-GO, Ministry of Electronics and Information Technology (MEITY), Chief Information Security Officer (CISO) etc. (IT Engineer)
- (e) Information Technology Tools

- (f) Crisis Management: Precautionary or pre-crisis phase, Crisis management or response phase and Post-crisis phase- case studies

II. Curriculum for Refresher Courses for renewal of Basic Level Certificates

The content of the Refresher Course shall be issued by Central Electricity Authority separately.

III. Curriculum for Advanced Level Certification

(i) Power System Operation and Regulatory Framework in Power Sector

- (a) Electricity Act Legal & Regulatory Framework in India with focus on Power Sector Role of CERC, SERC, JERC, Appellate Tribunal For Electricity (APTEL) etc.
- (b) National Electricity Policy and Tariff Policy, Green Hydrogen & Hydrogen Policy, Energy Storage System (ESS) Policy, National Electricity Plan
- (c) Electricity (Rights of Consumers) Rules, 2020 ,Rules/Regulations under Energy Conservation Act, 2001
- (d) Electricity (Late Payment Surcharge and Related Matters) Rules, 2022.
- (e) Grant of Regulatory Approval to CTU Guidelines and Standard Bidding Documents (SBDs) for procurement of Inter-State, Transmission Services (ISTS) through Tariff Based Competitive Bidding (TBCB) process
- (f) The Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022.
- (g) Power Demand Forecasting including Electric Vehicles.
- (h) Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Central Electricity Authority (Measures relating to Safety and Electricity Supply) Regulations
- (i) Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Central Electricity Authority (Technical Standards for Connectivity to the Grid) and (Amendment) Central Electricity Authority (Grid Standards) Regulations
- (j) Central Electricity Regulatory Commission (Planning, Coordination and
- (k) Development of Economic and Efficient Inter-State Transmission System by Central Transmission Utility and other related matters) Regulations, 2018
- (l) Central Electricity Authority (Installation and Operation of Meters) and (Amendments) Technical details by generating company regulations 2009
- (m) Indian Electricity Grid Code
- (n) Scheduling, Accounting, Metering and Settlement of Transactions in Electricity (SAMAST) Report Methodology of settlement of accounts for bilateral short term and

- collective transactions, for the period of Grid Disturbance Central Electricity Regulatory Commission (Deviation Settlement Mechanism and related matters)
- (o) Central Electricity Regulatory Commission (Terms and Conditions of Tariff) 19-24
 - (p) Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations
 - (q) Central Electricity Regulatory Commission (Terms and Conditions for Renewable Energy Certificates for Renewable Energy Generation) Regulations. The Central Electricity Regulatory Commission (Terms and Conditions for Dealing in Energy Savings Certificates) Regulations
 - (r) Central Electricity Regulatory Commission (Fees and Charges of Regional Load Despatch Centre and other related matters) Regulations Forum of Load Despatchers (FOLD) Report on CABIL
 - (s) Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-State Transmission and related matters) Regulations / GNA regulation Grant of connectivity to projects based on renewable sources to inter-state transmission system/ GNA regulation
 - (t) Transmission System Planning, Development and Recovery of Inter-State Transmission Charges Rules, 2021 Central Electricity Regulatory Commission (Sharing of inter-State Transmission Charges and Losses) Regulations Central Electricity Regulatory Commission (Sharing of Revenue Derived from Utilization of Transmission Assets for Other Business) Regulations.
 - (u) Central Electricity Regulatory Commission (Power Market) Regulations Framework for Real-Time Market
 - (v) Central Electricity Regulatory Commission (Procedure, Terms and Conditions for grant of trading licence and other related matters) Guidelines on Cross Border Trade of Electricity- 2016 Central Electricity Regulatory Commission (Cross Border Trade of Electricity) Regulations, 2019
 - (w) PSDF/Ancillary/Trading License/RSD
 - (x) Central Electricity Regulatory Commission (Ancillary Services) Regulations FOR Report on Intra-State Reserves and Ancillary Services For Balancing -(SANTULAN) (2020)
 - (y) Congestion Management Procedure in Real-Time System Operation
 - (z) CERC (Standards of Performance) Regulations 2012 Central Electricity Regulatory Commission (Power System Development Fund) Regulations DOP on Reserve Shutdown and Compensation Mechanism

(ii) **Power Market**

- (a) Rationale and Mechanisms of the Economic Reform Process, Liberalization, Privatization, and Globalization, Restructuring of Infrastructure Sectors. Market Architecture, Unbundling, Indian market evolution, World-wide Comparison/practices
- (b) Fundamental of Economics: Consumer behavior, Supplier behavior, Market equilibrium, Short-run and Long-run costs
- (c) Fundamentals of electricity markets: Market structure and operating mechanisms, bilateral and multi-lateral markets. Perfect Competition, Oligopolistic Market, Theories of Oligopoly.
- (d) Market Types- Power, Capacity, Ancillary Services, Financial Transmission Right
- (e) Different tariff principles (marginal cost, cost to serve, average cost), Consumer tariff structures and considerations, different consumer categories, fixed and variable charges, time of day, Subsidy and cross subsidy, life line tariff, Comparison of different tariff structures for different load patterns.
- (f) Electricity Markets Pricing: Electricity price basics, Market Clearing price (MCP), Zonal and locational MCPs.
- (g) Understanding the Indian Power Market: - Power Market Regulations, DAM, GDAM, TAM, G-TAM. Open Access, RTM,OTC, Market Coupling & future aspects
- (h) Resource Adequacy :- CAPEX & long term planning, Financing support, Risk management, Transmission pricing, BCD Procedure
- (i) Portfolio Management:- Forecasting, Scheduling, Long term and Short term arrangements
- (j) Ancillary Services(AS): Classifications and definitions, Market for AS, AS management in various markets, RRAS & AGC, SANTULAN Report Voltage Control AS, Black Start AS
- (k) Optimization techniques & tools, Optimal power flow, Security Constraint Economic Despatch , SCUC concept, MBED concept,
- (l) Power system operation in restructured markets: Coordinated real time despatch through balancing mechanism,
- (m) Imbalance settlement methodologies. Transmission Congestion Management and Methodologies, Congestion Pricing, Effect of congestion on LMPs.
- (n) Renewable energy market:- RE Policy and Bidding guidelines and relevant rules, Appraisal & Financing of Renewable Energy Projects, RPO, RPO Monitoring, REC, ESCert, Forecasting, Scheduling and Unbalance settlement
- (o) RE mix Scheduling concept, DER & tariff, Battery energy storage, Green Hydrogen, Future, International practices Energy Storage options (like BESS, Pumped Storage, Flywheel etc) and experiences from the other countries

- (p) Accounting & Settlement:- SAMAST, Metering, REA, Pool accounts, RTA/RTDA, Ancillary service settlement, Energy storage systems, STOA, Exchange, Banking etc.
- (q) Comparative study and global experience of historical evolution, institutional development, contemporary systems, regulation, reforms, deregulation models, market trends, operation, critical issues, challenges, future directions of key electricity markets: UK, South American markets (Argentina, Brazil, Chile, Uruguay), US (California, New York, PJM, ERCOT, New England, Midwest), Scandinavian market (Norway, Denmark, Sweden, Finland), Canada, Australia, China, Japan, Germany, New Zealand, France.
- (r) GNA, NOAR, Green NOAR
- (s) Cross border trading :- Cross border exchange overview, Regulations/policy, Future Development, Comparison with European Market
- (t) Power market derivatives: Basic concepts, needs & products, Electricity Derivatives, Comparison with Commodity & Currency market, Role of system operators, Future development, International practices

(iii) **Power System Reliability**

- (a) Circuit Fundamentals, Types of Circuit Elements, Sources, Kirchhoff Voltage Law (KVL), Kirchhoff Current Law (KCL), Theorem, Types of Circuits, Star and Wye Connection, Per Unit (PU) Systems, Operating States
- (b) Per Unit System, Introduction to Power Flow Solution, Y- Bus Matrix formation, Types of Load Flow Analysis, PV QV Analysis
- (c) EHV AC Transmission
- (d) EHV Transmission, Concepts, Planning & Design, Power Loss, Voltage Drop, Resistance, Regulation, Efficiency, Limits, Grid Code, Advantage and Disadvantage, Types of Towers, Substation Layout, Impulse, Network Models, Conductors, Insulators, Earthwire, Survey and Design of Transmission Lines, National and International Statistics
- (e) HVDC Transmission
- (f) Advantages and Disadvantages, HVAC Vs HVDC Comparison, Types of HVDCs, Survey and Design, HVDC S/s Details, Modes of Operation, National and International Statistics
- (g) Fault Analysis - I Transmission Fault Types, Equipment Modelling for Faults, Types of Faults, Z-Bus Formation, Institute of Electrical and Electronics Engineers (IEEE) and Other Standards, National and International Standards on Fault Analysis, Fault Analysis - II
- (h) Flexible alternating current transmission system (FACTS) and Power Transmission Control

- (i) Types of Facts Devices, STATic synchronous COMPensator (STATCOM), Voltage Source Converters (VSC) , Types of Compensation, Characteristics, Power Transfer Graphs, FACTS in RE Sources, National and International Statistics
- (j) Power System Study Lab - I In-depth Analysis on Power System Solution
- (k) Methods for Steady State Power Flow, Construction of Base Cases for conducting Studies regarding Planning, Real-Time and Post Event Studies in
- (l) Power System Planning - I Principles of Planning, Types of Planning, Planning Process & Procedure, Types of Studies Conducted, Designing of Base Cases, Planning Committees, Transmission Planning Criteria, Relevant Regulations
- (m) Power System Protection I
- (n) Philosophy of Protection, National and International Standards of Protection, Bus Bar Protection, Transmission Line Protection, Zones, Relay Characteristics.
- (o) Power System Protection II
- (p) Generator Protection, HVDC, FACTS Devices, Renewables etc, Post Despatch Analysis using Disturbance Recorder, Fault Signature Analysis
- (q) Power System Stability - I Stability Definition, Types of Power System
- (r) Stability, Operating States, Power-Angle Relationship, Stable vs Unstable Systems, SPS, Islanding Schemes, National and International
- (s) Utilization of Phasor measurement units (PMUs) II
- (t) Application of PMU data for System Analysis, Case -Studies, Oscillation Source Location identification with Modal Analysis, National and International Statistics
- (u) Power System Operation - I Power Flow Concepts, System Frequency Concepts, Steady State Power Flow Concepts, Steady State Voltage Control, Economic Despatch-I, Hydro Scheduling, Hazards & Safety
- (v) Power System Operation -II
- (w) Frequency Control, National and International Best Practices, Resource Optimization, Unit Commitment, Economic Despatch, Area Control Error
- (x) Full Day Field Visit to any RE Generation, 765/400 kV HVAC, HVDC etc.
- (y) Dynamic Studies – I
- (z) Dynamic Simulation Overview and Tools, High Level Overview of Dynamic Systems
- (aa) Dynamic Studies – II
- (bb) Modelling of Power Plant Components, HVDCs, FACTs etc.
- (cc) Dynamic Studies - III Modelling of Renewable Resources
- (dd) Dynamic Simulation of appropriate Software
- (ee) Dynamic Studies - IV
- (ff) Power System Model Validation Concepts, Tuning of Various Equipment Parameters viz. Governor, Exciters, PSS etc.
- (gg) Transient Studies I
- (hh) Importance of Transient Studies, Preparation of Base Cases, Discussion on Modelling of Equipment, Electromagnetic Transient Studies, Transformers,

- (ii) Faults and Protection, Induction Machines, Power Electronic & FACTS Devices, Generators, Power Quality etc.
- (jj) Case Studies, Hands-on Training on Appropriate Software, National and International Standard on Transient Studies
- (kk) Power System Resiliency I Difference between Reliability and Resiliency,
- (ll) Enhancing Resiliency, Cost Benefit Analysis for Resiliency, Disaster Management, Emergency Restoration Systems, National and International Standards for resiliency, Case Studies
- (mm) Power System Resiliency II
- (nn) Power System Restoration -I
- (oo) Philosophy of Power System Restoration, Restoration Approaches, Assessment, Islanding and standby power supply (SPS) Design, Automatic Load Restoration, Hunting, Limitations, Black Start, Grid Disturbance Case Studies, Do's and Don'ts in Power System Restoration, National and
- (pp) Power System Restoration -II
- (qq) Resource Adequacy Framework & International Practices Resource Adequacy Planning and Reserve Estimation, Best National and International Practises,
- (rr) Methodology, Technology and Human Resource Requirement
- (ss) Optimization Techniques & Tools Optimization Techniques, Different Types of Mathematical Methods, Tools such as PLEXOS, GAMS, MATLAB, Python etc, Case Studies

(iv) Renewable Energy (RE) Source and Grid Integration

- (a) India and World RE Power scenario, Energy Efficiency and Climate Change obligations, Conference of the Parties (CoP) 26, United Nations Framework Convention on Climate Change (UNFCCC) & recent development, International and India commitment & target towards Renewable
- (b) Overview of Various RE Technologies (Wind, Solar, small Hydro ,Bio-mass and Bagasse, Hybrid etc.), Design Aspects, Conceptualization and Implementation of Solar Power Plants, latest trends, built-in protections and features to support grid connectivity
- (c) Energy Storage options (like Battery Energy Storage System (BESS), Pumped Storage, Hydrogen energy, Fly wheel, compressed Air & other new Technologies) and experiences from the other countries
- (d) RE Policy and Bidding guidelines and relevant rules, Appraisal & Financing of Renewable Energy Projects
- (e) First Time Charging (FTC) Procedure of Renewable Energy Generator, Accredited Agency for relevant testing & model validation (Lab Test, Type Test etc), International practices on RE Standards

- (f) Forecasting, Scheduling and Deviation Settlement mechanism of Wind, Solar, Hybrid RE etc. at Inter-state and Intra-state level. Forecasting Tools and Techniques, QCA Role, Meteorological forecasting & India Meteorological Department (IMD) Weather data for RE; Forecasting at different grid levels (i.e. project level, regional, control area level etc), aggregation and combination of various forecasts.
- (g) Green Energy Corridor (GEC), Optimizing Right of Way (RoW) through Bess, Planning Criteria of RE, Substation Layout and Various Network Layers etc.
- (h) Renewable Energy Management Centres - Systems and associated functioning, visualization and enhanced situational awareness
- (i) Steady State & Dynamic modelling of Wind turbine generator (WTG) & Grid Connected Solar
- (j) Power Quality Issues, Active Network devices, FACTS applications, Rectifier, Inverter and Power Conditioning Systems in RE integration
- (k) Technical/Site visits to Grid connected Wind Power Plant / Solar Power Plant
- (l) Relevant Standard & Regulations related to RE (like CEA Standards on RE, RE Tariff Regulations and Grid Connectivity etc, Green Open Access Rules (GOAR)
- (m) Policy regarding EV Charging stations & Green Hydrogen Technologies at National & Typical State level
- (n) RE grid integration - Issues, Challenges (Intermittency, Variability and Unpredictability), Causes and Impact- Case studies, Fault Ride Through (LVRT/HVRT)
- (o) Grid Connected Solar Roof Top SPV Generation Challenges, issues in its implementation; Solarisation of Agriculture Feeder, DER etc
- (p) Night Mode Operation of Solar Power Plant, Various types of Reactive Power Control viz. Voltage Control mode, Reactive and Power Factor mode, Reactive Power support during nil or less Wind Generation Power Plant Controller(PPC), Remote Operation of RE through LDCs, AGC etc
- (q) Policy Incentive, Govt Schemes (PM KUSUM, AJAY, JNNSM & VGF scheme etc) and Support Mechanism, Tariff Mechanism, commercial aspects and Electricity Market for RE
- (r) Optimization and energy harvesting for modern grid, Optimal generation for grid operation and management. Optimal operations of storage systems in a power system with high share of PV and Wind generators
- (s) Renewable Purchase Obligation(RPO), Hydro Purchase Obligation(HPO) monitoring its compliance mechanism, Renewable Energy Certificate(REC) Mechanism, Carbon Trading etc

(v) Power System Logistics

- (a) Fundamentals of SCADA Systems in LDCs - Historical background, basic fundamentals, design architecture and Visualization

- (b) Overview of CEA Transmission Planning Criteria Central Electricity Authority (Technical Standards for Communication System in Power System Operation) Regulations, 2020.
- (c) Data acquisition principles and case studies - Site to Control Centre on IEC-101/104 protocols
- (d) (Basic Operation and Maintenance) Database Modelling and associated O&M - SCADA applications
- (e) Data acquisition principles and integration challenges - Control Centre to Control Centre on ICCP protocol
- (f) (Communication) Substation Automation - IEC 61850 based
- (g) Communication Systems in Power Sector - Media and Protocols
- (h) (REMCs) Renewable Energy Management Centres - Systems & associated functioning
- (i) Scheduling and Forecasting tools at Renewable Energy Management Centres (REMCs)
- (j) Auxiliary Power System (APS)

IV. Curriculum for Refresher Courses for renewal of Advance Level Certificate

The content of the Refresher Course shall be issued by Central Electricity Authority separately.

V. Curriculum for Maintenance of Load Despatch Centres

Total duration: 3 weeks

For Information Technology (IT)/ Electronics & Communication Engineer/ Electrical Engineer

- (a) Wide Area Monitoring Systems(WAMS) - PMU based Analytical Applications used in WAMS systems
- (b) Hardware and Networking / CIM Control Centre Hardware and Networking Devices
- (c) Common Information Model (CIM) Overview - Compatibility across different versions
- (d) EMS applications - State Estimation (Topology Processing, Observability, Weighted Least Square Method and Bad Data Detection), Tuning of EMS applications - Examples and Case Studies
- (e) EMS applications - Contingency Analysis, Transfer Corridor Monitoring and Security Enhancement
- (f) Dispatcher Training Simulator - Functioning and Use Cases
- (g) Cyber Security of SCADA Systems - Design Architecture and Best Practices
- (h) Introduction to Security information and event management (SIEM) & various Cyber Security tool use in OT System
- (i) (Regulations and Processes) Data historian applications and Advance visualization techniques – Implementation

- (j) Regulations related to SCADA and Communication - By CERC and CEA
- (k) AMR Architecture, Introduction to AGC and Implementation In India

After completing this from a CEA recognized training institute, the personnel engaged in maintenance of control room of load despatch centre shall be deputed for training with OEM or Authorized vendor who has supplied the SCADA of the respective Load Despatch Centre.

CHAPTER-VI
FORMAT/ FORM FOR SUBMISSION OF INFORMATION BY THE TRAINING INSTITUTE AND
OTHER FORMS / FORMATS

The following are the Forms / Formats as mentioned in these guidelines:

- (1) Annexure-I:** Form-A (Application Form for Statutory Recognition of Training Institutes)
- (2) Annexure-II:** Form-B (Application Form for Renewal of Recognition of Training Institutes)
- (3) Annexure-III:** Format for Record of Training Details of Load Despatchers (For Load Despatch Centres)
- (4) Annexure-IV:** Format for Record of Training Details of other personnel engaged in O&M (For Load Despatch Centres)
- (5) Annexure-V:** Format for Record of Assessment of Training of Load Despatchers by Certification Agency
- (6) Annexure-VI:** Formats/Forms for Certificate by Certification Agency/Training Institute

CENTRAL ELECTRICITY AUTHORITY

Application Form A

(To be filled for last financial year and each page to be signed by Head of the Institute)

Application Form for Statutory Recognition of Training Institutes under Regulation 9 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 pertaining to personnel engaged in load despatch

Name of the Training Institute:

Permanent Account Number (PAN) of the Training Institute:

Complete address: _____

Name of the Head of the Training Institute:

Telephone nos. Office: _____ **Residence:** _____

Email address: _____ **Mobile no.** _____

Website of the Institute: _____

Name of the Owner of the Training institute:

GENERAL INFORMATION

1. Training Institute owned by (Tick Appropriately): Central Government/ State Government/ Private/ Others.

2. Mandatory Requirement :

Whether all the mandatory conditions given below are met? : Yes/No

Sr No.	Mandatory Conditions	Yes/No
(1)	The training institute shall have a full time Principal/Director and teaching staff.	
(2)	There should be a separate building which shall be solely used for the purpose of training. The building shall either be owned by the institute or on lease. However, in case the building is on lease then the lease period shall be more than the period of recognition.	
(3)	The training institute shall score at least 65% in the evaluation criteria for getting its recognition from the Authority.	
(4)	The training institute shall have the facilities of providing training on simulator and offline simulation tools such as Power System Simulation for Engineering (PSSE), Power Systems Computer Aided Design (PSCAD) etc. and for slide shows & multimedia. The training institute shall have institutional tie up for simulator training/labs/workshops, if not having in-house.	
(5)	The institute shall have at least 5 number of servers of latest configuration and loaded with one simulation tool for steady state and transient analysis of balanced system and one for Electromagnetic Theory (EMT) studies with ability to model individual phases of the Power System, besides other general applications. The training institute shall ensure that each trainee is provided with one terminal at a time and capable of executing all the applications hosted by the servers.	
(6)	The training institute shall have CCTV facility at the examination hall for conducting the certification exam. The training institute may have tie up with independent agency for conducting the exam which shall have CCTV facility at the examination hall for conducting the exam.	

(7)	The training institute shall have basic medical facilities and high speed Internet facilities in its premises.	
(8)	Budget provision and control of expenditure for training program shall be distinctly and exclusively earmarked for the institute.	
(9)	The training institute shall give an undertaking that on recognition for 3 years initially, the institute shall follow the curriculum as per these guidelines.	

3. Number of personnel trained (Organization-wise):

The list of trained personnel duly authenticated to be attached.

4. Annual Training Capacity of the Institute (Days) :

5. Annual Budget Provisions for training:

(Rupees in lakh)

Year	Allocated Budget	Budget Utilized	% Budget Utilized
F.Y.			

6. Infrastructure (The information shall be related with the Training Institute):

a. Details of Classrooms (including seminar/syndicate rooms/computer rooms) in the training institute:

No. of Classrooms	Seating Capacity	Whether A-V aids /facilities provided	Whether Live streaming capability provided	Remarks
(1)	(2)	(3)	(4)	(5)
		Yes/No	Yes/No	

b. Details of Hostel Facilities in the training institute:

No. of Rooms x Beds*	Hostel Capacity	No. of days for which hostel is	Annual occupancy during the year (Mandays i.e.	% Annual occupancy

	(Total no. of beds)	available Annually	annual sum of no. of trainees stayed each day)	

*e.g. 24x2 stands 24 twin-bed rooms, and 13x1 for 13 single-bed rooms.

c. Details of Simulators:

Number and details of Simulators for training relating to Load Despatchers/ System Operators to be attached.

d. Details of Library/ e-library:

(i). Reading Rooms (mention seating capacity of each):

(ii). Number of books, e-books and Journals:

(iii). Whether Library areas are air-conditioned? Yes / No

e. Multimedia training packages (attach list as per format below):

Sl. No.	Subject	Numbers	Remarks

f. Whether the training institute has e-integration with other Training Institute within the organization or with other organizations: Yes/ No

If yes, then attach the list with the details.

g. Whether the training institute has linkage with the load despatch centre in respect of organizing and monitoring the on-job training: Yes/ No

If yes, then furnish the name of the organization where on-job training imparted.

h. Do you have an officer designated as an On-job Trainer? Yes/No

If yes, then give the name and designation of the officer.

i. Auditorium/Conference Hall Yes/No

If yes, then mention Seating Capacity :

j. Reprographic Facilities/Resource Centre Yes/No

If yes, attach the list with details.

k. Quality of Infrastructure as rated by the applicant/ institute itself as excellent / very good/ good:

(a) Quality of Maintenance: (Excellent / Very Good/ Good)

- (b) Quality of Air Conditioning: (Excellent / Very Good/ Good)
- (c) Maintenance of cleanliness and hygiene: (Excellent / Very Good/ Good)
- (d) Other facilities (please tick among the following):
 - (i) Transport
 - (ii) Recreation (Indoor/ Outdoor)
 - (iii) Laundry services
 - (iv) Mess/ Canteen
 - (v) Medical facilities
 - (vi) High Speed Internet
 - (vii) Gym
 - (viii) Others

7. Faculty:

(1) Details of Faculty (Core Faculty + Empaneled Faculty + Guest Faculty) for training shall be furnished by the applicant. The list of faculty (Core Faculty / Empaneled Faculty / Guest Faculty) to be submitted in the format given below:

Sl. No.	Name of faculty member	Qualification	Experience	Specialization
A. Core faculty (as defined in the Guidelines)				
1.				
2.				
B. Empaneled faculty (as defined in the Guidelines)				
1.				
2.				
C. Guest faculty / Experts (as defined in the Guidelines)				
1.				
2.				

(2) The details mentioned at para (1) above regarding faculty to be summarized as per the table given below:

Total	Numbers			Qualification wise(nos.)				Core faculty trained during the year (nos.)
	Core*	Empaneled*	Guest*	Diploma	Degree	P.G.	Ph.D.	

* as defined in the guidelines

(3) Experience:

- (i) No. of Faculties (Core+Empaneled+Guest) having experience more than 5 years but less than 10 years:
- (ii) No. of faculties (Core+Empaneled+Guest) having experience more than 10 years:

(4) Details of depth of knowledge of Core Faculty:

S. No.	Area	Details
(1)	Papers Published in Conference or Seminars by Core Faculties	1. 2. 3.
(2)	Core Faculties Empaneled with other Institutes	1. 2. 3.
(3)	Membership of the Training institute in National or International Body	1. 2. 3.
(4)	Working Models or Simulation Models made by Core Faculties	1. 2. 3.

8. Training Courses

- (1) The courses conducted during the last financial year to be provided in the format given below:

	Name of course	Modules / topics covered	Duration (From-To)	No. of Trainees	Days
	Courses relevant to Power Sector 1. 2. Sub-total				
	Training on Simulator 1. 2. Sub-total				
	On-job training at load despatch centre 1. 2. Sub-total				
	Total				

(2) The no. of courses and the no. of persons trained during the last F.Y. to be furnished as per the table given below:

Year	Number of courses	Persons trained	
		Nos.	Days
F.Y.			

(3) Break up of total training days during the last financial year:

Sl. No.	Type of Course	Persons trained	Days
1.	<i>Theory Courses*</i>		
2.	Simulator training		
3.	On-job training		

*Online training shall be included in the theory courses

9. Training methodology

- | | | |
|---|--------|-------------------------|
| (i) Classroom lectures | Yes/No | } (Enclose the Details) |
| (ii) Group Discussion Session | Yes/No | |
| (iii) On-job Training | Yes/No | |
| (iv) Case Studies and presentation
by each trainee | Yes/No | |

10. Instructional capability

- (1) Has the Core faculty been adequately trained in the instructional technique in last F.Y.? Yes/No

If yes,

Name of the Core Faculty member	Training in instructional techniques			
	At Institute	Period		Days
		From	To	

- (2) Whether the digital handouts related to course content are prepared for each lecture and given to trainees? Yes/No
- (3) Do the digital handouts clearly indicate the objectives of the lesson, various elements into which the lesson has been broken relevant to syllabus? Yes / No
- (4) Is the lecture supported by the objective type questions? Yes/No
- (5) Feedback from trainees on (attach a copy of sample feedback)
- | | |
|---------------------------|--------|
| (i) Each Faculty | Yes/No |
| (ii) Each Training module | Yes/No |
| (iii) Training need | Yes/No |
| (iv) Institute Facilities | Yes/No |

Date:

Signature of head of the Training Institute with Office Stamp/Seal

CENTRAL ELECTRICITY AUTHORITY

Application Form-B

(To be filled for last three financial years each, separately and each page to be signed by Head of the Institute)

Application Form for RENEWAL of Statutory Recognition of Training Institutes under Regulation 9 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 pertaining to personnel engaged in Load Despatch

Name of the Training Institute:

Permanent Account Number (PAN) of the Training Institute:

Complete address: _____

Name of the Head of the Training Institute:

Telephone nos. Office: _____ **Residence:** _____

Email address: _____ **Mobile no.** _____

Website of the Institute: _____

Name of the owner of the Training institute:

GENERAL INFORMATION

1. Year of Recognition of Training Institute (attach the Certificate of Recognition):
2. Training Institute owned by (Tick Appropriately): Central Government/ State Government/ Private/ Others.
3. **Mandatory Requirement :**

Whether all the mandatory conditions given below are met? Yes/No

Sr No	Mandatory Conditions	Yes/No
(1)	The training institute shall have a full time Principal/Director and teaching staff.	
(2)	The training institute shall have at least 2 faculties (core/empaneled/guest) in relevant specialized topics/subjects of the curriculum given in these guidelines.	
(3)	There should be a separate building which shall be solely used for the purpose of training. The building shall either be owned by the institute or on lease. However, in case the building is on lease then the lease period shall be more than the period of recognition.	
(4)	The training institute shall have the facilities of providing training on simulator and offline simulation tools such as Power System Simulation for Engineering (PSSE), Power Systems Computer Aided Design (PSCAD) etc. and for slide shows & multimedia. The training institute shall have institutional tie up for simulator training/labs/workshops, if not having in-house.	
(5)	The institute shall have at least 5 number of servers of latest configuration and loaded with one simulation tool for steady state and transient analysis of balanced system and one for Electromagnetic Theory (EMT) studies with ability to model individual phases of the Power System, besides other general applications. The training institute shall ensure that each trainee is provided with one terminal at a time and capable of executing all the applications hosted by the servers.	
(6)	The training institute shall conduct Basic Certification Course, Basic Level Refresher Course, Maintenance Course and Advance Certification Course, Advance	

	Level Refresher Course as per the curriculum given in these guidelines.	
(7)	The training institute\independent agency conducting the exam shall have CCTV facility at the examination hall for conducting the certification exam. The training institute may have tie up with independent agency for conducting the exam which shall have CCTV facility at the examination hall for conducting the exam.	
(8)	The training institute shall have medical facilities and high speed internet facilities in its premises.	
(9)	Budget provision and control of expenditure for training program shall be distinctly and exclusively earmarked for the institute.	
(10)	The training institute shall score at least 65% in the evaluation criteria for getting its recognition from the Authority.	

4. Number of personnel trained Organization wise :

The list of trained personnel duly authenticated to be attached.

5. Annual Training Capacity (in days):

6. Annual Budget provisions for training:

(Rupees in lakh)

Year	Allocated Budget	Budget Utilized	% Budget Utilized
F.Y.			

7. Infrastructure (The information shall be related with the Training Institute):

a. Details of Classrooms (including seminar/syndicate rooms/computer rooms) in the training institute:

No. of Classrooms	Seating Capacity	Whether A-V aids facilities provided	Whether Live streaming capability provided	Remarks
(1)	(3)	(4)	(5)	(6)
		Yes/No	Yes/No	

b. Details of Hostel Facilities in the training institute:

No. of Rooms x Beds*	Hostel Capacity (Total no. of Beds)	No. of days for which hostel is available Annually	Annual occupancy during the year (Mandays i.e. Annual sum of no. of trainees stayed each day)	% Annual occupancy

*e.g. 24x2 stands 24 twin-bed rooms, and 13x1 for 13 single-bed rooms.

c. Details of Simulators:

Number and details of Simulators for training relating to Load Despatchers to be attached.

d. Details of Library/ e-library:

(i). Reading Rooms (mention seating capacity of each):

(ii). Number of books and Journals:

S. No.		No.
1	Books	
2	e-books	
3	Journals	

(iii). Whether Library areas are air-conditioned? Yes / No

e. Multimedia Training Packages (attach list as per format below):

Sl. No.	Subject	Numbers	Remarks

f. Whether the training institute has e-integration with other Training Institute within the organization or with other organizations: Yes/ No

If yes, then attach the list with the details.

g. Whether the training institute has linkage with the load despatch centre in respect of organizing and monitoring the on-job training: Yes/ No

If yes, then furnish the name of the organization where on-job training imparted.

- h. Do you have an officer designated as an On-job Trainer? Yes/No

If yes, then give the name and designation of the officer.

- i. Auditorium/Conference Hall Yes/No

If yes, then Seating Capacity:

- j. Reprographic Facilities /Resource Centre Yes/No

If yes, attach the list with details.

- k. Quality of Infrastructure as rated by the applicant/ institute itself as excellent / very good/ good:

(e) Quality of Maintenance: (Excellent / Very Good/ Good)

(f) Quality of Air Conditioning: (Excellent / Very Good/ Good)

(g) Maintenance of Cleanliness and Hygiene: (Excellent / Very Good/ Good)

(h) Other Facilities (please tick among the following):

(i) Transport

(ii) Recreation (Indoor/ Outdoor)

(iii) Laundry services

(iv) Mess/ Canteen

(v) Medical facilities

(vi) High Speed Internet

(vii) Gym

(viii) Others

- l. Quality of Training Imparted

(i) Overall rating of the institute by the previous trained batches.

(ii) Overall Test scores achieved by the trainees (Course Type-wise)

(iii) Percentage of trainees completed the Course (Course Type-wise)

8. Faculty:

(1) Details of Faculty (Core Faculty + Empaneled Faculty + Guest Faculty) for training shall be furnished by the applicant for the last three years. The list of faculty (Core Faculty / Empaneled Faculty / Guest Faculty) to be submitted in the format given below:

Sl. No.	Name of faculty member	Qualification	Experience	Specialization
A. Core faculty (as defined in the Guidelines)				
1.				
2.				
B. Empaneled faculty (as defined in the Guidelines)				
1.				
2.				
C. Guest faculty / Experts (as defined in the Guidelines)				
1.				
2.				

(2) The details mentioned at para (1) above regarding faculty to be summarized as per the table given below:

Total	Numbers			Qualification wise(nos.)				Core Faculty trained during the year (nos.)
	Core*	Empaneled*	Guest*	Diploma	Degree	PG	Ph.D.	

* as defined in the guidelines

(3) Experience:

(i) No. of faculties having experience more than 5 years but less than 10 years:

(ii) No. of faculties having experience more than 10 years:

(4) Details of depth of Knowledge of Core faculty:

S. No.	Area	Details
(1)	Papers Published in conference or seminars by core faculties	1. 2. 3.
(2)	Core Faculties Empaneled with other institutes	1. 2. 3.
(3)	Membership of National or International body of the training institute	1. 2. 3.

	
(4)	Working models or simulation models made by core faculties	1. 2. 3.

9. Training Courses

- (1) The courses conducted during the last three years as per the curriculum mentioned in these guidelines, to be provided in the format given below:

	Name of course	Modules / topics covered	Duration (From-To)	Total Days	No. of Trainees
	1. 2. Sub-total				
	Training on Simulator 1. 2. Sub-total				
	On-job training at load despatch centre 1. 2. Sub-total				
	Total				

- (2) The no. of courses and the no. of person trained to be furnished as per the table given below:

FY	Number of courses	Persons trained		Annual training capacity (days)
		Nos.	(Days)	

(3) Break up of Total Training Days :

Sl. No.	Type of Course	Persons trained	
		No.	Days
	Courses*		
1.	Basic Certification		
2.	Advance Certification		
3.	Basic Refresher		
4.	Advance Refresher		
5.	Simulator training		
6.	Maintenance Training		
7.	On-job training		

*Online training shall also be included in these courses.

Courses are in line with the Guidelines-

Yes/No

10. Training methodology

- (i) Classroom lectures Yes/No
- (ii) Group Discussion Session Yes/No
- (iii) On-job Training Yes/No
- (iv) Case Studies and presentation by each trainee Yes/No

} (Enclose the Details)

11. Instructional capability

(1) Has the training faculty been adequately trained in the instructional technique in last three F.Y?

Yes/No

If yes,

Name of the core faculty member	Training in instructional techniques			
	At Institute	Period		Days
		From	To	

Format for Training Details of Load Despatchers**Certificate by the head of the Load Despatch Centre** (Name of the Load Despatch Centre)

It is certified that all the load despatchers engaged in the operation of the control room of the Load Despatch Centre possess mandatory certificate in line with the Regulation 9(2) of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 from the Training Institute recognized by Central Electricity Authority. The records of their assessment has been maintained as per the format mentioned in the Guidelines.

Date

Head of the Load Despatch Centre

Details for Financial Year:

Training Details maintained by:

Training Details approved by:

	Employee details								Training details					
Sl. No.	Name	Designation	Aadhar No.	Employee No./ identification No.	Date of Induction	Date of posting at load despatch centre	Engaged in Real-Time Control Room shift operation (Y/N)	Date of posting in Real-Time Control Room shift operation	Name of the training and certification	Date from	Date to	Name of the Certification Agency	Marks obtained in exam (%)	Training venue

Format for Training Details of other personnel engaged in O&M**Certificate by the head of the Load Despatch Centre** (Name of The Load Despatch Centre)

It is certified that all the personnel engaged in the maintenance of the control room of the Load Despatch Centre have been trained as per the curriculum in the Guidelines issued by Central Electricity Authority in line with the Regulation 9(2) of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 in the training institute recognized by Central Electricity Authority. The records of their assessment has been maintained as per the format mentioned in the Guidelines.

Date

Head of the Load Despatch Centre

Details for Financial Year:

Training Details maintained by:

Training Details approved by:

Employee Details							Training Details				
Sl. No.	Name	Designation	Aadhar no.	Employee No./ identification No.	Date of Induction	Date of posting at Load Despatch Centre	Name of the training	Date From	Date To	Training Organised by	Training venue

Format for Record of Assessment of Load Despatchers by Certification Agency

Employee Details								Certification Details				
Sl. No.	Name	Roll No.	Aadhar No.	Designation	Department	Employee No./ identification No.	Load Despatch Centre	Name of certification	Date of examination	Marks obtained (%)	Certification valid from (Date)	Certification valid upto (Date)

Certificate by the Training Institute

This is to certify that Shri/Ms._____ Aadhar no._____ has successfully completed Training Course on Load Despatch which is in accordance with the Curriculum mentioned in the Guidelines issued by Central Electricity Authority in line with the Regulation 9(2) of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023.

Date

Head of the training Institute.

Certificate by the Training Institute

This is to certify that Shri/Ms._____ Aadhar no._____ has successfully completed Training Course on maintenance of control room is in accordance with the Curriculum mentioned in the Guidelines issued by Central Electricity Authority in line with the Regulation 9(2) of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023.

Date

Head of the training Institute.