भारत सरकार

GOVERNMENT OF INDIA

विद्युत मंत्रालय

MINISTRY OF POWER

केंद्रीय विद्युत प्राधिकरण

CENTRAL ELECTRICITY AUTHORITY

मानव संसाधन विकास प्रभाग

HUMAN RESOURCE DEVELOPMENT DIVISION

विद्युत प्रसारण के क्षेत्र में प्रशिक्षण संस्थानों की मान्यता के लिए और इंजीनियरों, पर्यवेक्षकों और तकनीशियनों के प्रशिक्षण पाठ्यक्रम के विवरण के लिए मार्गदर्शी सिद्धांत

Guidelines for Recognition of Training Institutes in the field of Transmission of Electricity including details of training Curriculum for Engineers, Supervisors and Technicians

January, 2024

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CHAPTER-I
BACKGROUND, OBJECTIVE AND SCOPE

1. **Background:** 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 provisions for training for the personnel engaged in the operation and maintenance of transmission segment of power sector have been made mandatory under the **Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 (hereinafter to be referred as "Safety Regulations")**. The provisions have been made under regulation 8 of the Safety Regulations for mandatory training of the personnel engaged in operation and maintenance of transmission segment of power sector. As per the Safety Regulations, 2023 the Authority shall issue guidelines for the training for operation and maintenance of transmission segment of power sector within six months of the notification of these regulations.

   The curriculum for the training of personnel engaged in Operation & Maintenance of transmission segment of power sector was the part of Central Electricity Authority (Measures relating to Safety and Supply) Regulations, 2010. The same needed to be updated and made part of these guidelines.

   Accordingly, **Guidelines for Recognition of Training Institutes for Power Sector in the field of Transmission as per CEA (Measures Relating to Safety & Electric Supply) Regulations, 2023 along with updated Curriculum is detailed hereunder.**

2. **Objective:** As per the requirement of **Safety Regulations**, the personnel engaged for the Operation & Maintenance of Transmission systems shall require to be imparted statutory training from the institutes recognized by the Central Electricity Authority (CEA) for ensuring safe, secure, reliable and economic operations of the Transmission systems.

3. **Scope:**
   (1) These guidelines include the procedure and criteria for recognition of the training institutes for imparting training to the personnel engaged to operate or undertake maintenance of Transmission systems.

   (2) These guidelines also include the curriculum including-content of the training course to be followed by the training institutes for training of personnel engaged to operate or undertake maintenance of Transmission systems.

4. **Provisions in Safety Regulations regarding Training of Engineers, Supervisors and Technicians engaged for the Operation & Maintenance of Transmission systems.**

   (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 08.06.2023 has notified the CEA (Measures relating to Safety & Electric Supply) Regulations, 2023 which provide for mandatory training for the personnel engaged for the operation & maintenance of Transmission systems.

   (2) The Regulation 8 of the Safety Regulations provide the details with regard to the mandatory requirement for training for the personnel engaged for the operation & maintenance of Transmission systems , and also mandates CEA to make guidelines for such trainings in the training institute recognized by the Authority , which is reproduced as under:

"8.Safety measures for operation and maintenance of transmission and distribution systems. *– **(1)** The Engineers or Supervisors engaged or appointed to operate or undertake maintenance*

of transmission and distribution systems shall hold degree or diploma in appropriate trade of Engineering from a recognised institute or university.

(2) *The Engineers and Supervisors engaged or appointed to operate or undertake maintenance of transmission and distribution systems shall have successfully undergone the type of training specified in guidelines as per sub regulation (4), within two years from the date of engagement or appointment.*

(3) *The Technicians to assist Engineers or Supervisors shall possess a certificate in appropriate trade, preferably with a two years course from an Industrial Training Institute recognised by the Central Government or State Government and should have successfully undergone the type of training as specified in guidelines as per sub regulation (4), within two years from the date of engagement or appointment:*

Provided that the existing employees, as on the date of notification of these regulations, who are extending technical assistance to Engineers or Supervisors and do not have requisite qualification as mentioned in this regulation, shall have to undergo the training either from Power Sector Skill Council or from training institute recognised by the Authority for carrying out trade specific course as per the guidelines issued by the Authority and get certificate as mentioned above within two years from the date of notification of these regulations.

(4) *The Authority shall issue guidelines for the training for operation and maintenance of Transmission & Distribution systems within six months of the notification of these regulations:*

Provided that the duration and content of the training course shall be as specified in the guidelines.

(5) *Owner of every transmission or distribution system shall arrange for training of their personnel engaged or appointed to operate and undertake maintenance of transmission and distribution systems, in his own institute or any other institute recognised by the Authority or State Government as per the guidelines and shall maintain records of the assessment of these personnel issued by the training institute in the format prescribed in guidelines and such records shall be made available to the Electrical Inspector, as and when required.**"***

5. Category of Training Institutes:

(1) There shall be three categories of training institutes in terms of Safety Regulations of CEA:

i) Category-I for Engineers under sub regulation 8(2) of Safety Regulation 2023
ii) Category-II for Supervisors under sub regulation 8(2) of Safety Regulation 2023
iii) Category-III for Technicians under sub regulation 8(3) of Safety Regulation 2023

(2) All the training institutes of Central Sector to be recognised by the Authority, must have separate training facilities and modules for Engineers, Supervisors and Technicians in categories I, II and III respectively within six months of issuance of these guidelines. All the training institutes of State and Private Sector, may explore the possiblities for having separate training facilities and modules for Engineers, Supervisors and Technicians in categories I, II and III respectively.

6. Training Institutes to be Recognised by the Authority:

(1) The training institutes owned wholly or partly by the Central Government/Central Power Sector Undertakings/Central Government Organizations willing to offer training to personnel

engaged to operate or undertake maintenance of Transmission Systems shall be recognized by Authority.

7. Training Institutes owned by State Government or Private Sector to be Recognised by the State Government or by the Authority:

(1) The training institutes owned wholly or partly by the State Government/State Power Sector Undertakings/State Government Organizations willing to offer training to personnel engaged to operate or undertake maintenance of Transmission Systems, shall be recognized by the Authority or by the respective State Government as per these guidelines.
State Government while recognizing the training institutes including hotline training institutes shall strictly follow these guidelines.

(2) The Training Institutes under the control of Private Power Sector Utilities or under any other Private Sector company, willing to offer training to personnel engaged to operate or undertake maintenance of Transmission Systems, shall be recognized by the Authority or by the respective State Government ,where the institute is physically located , as per these guidelines.
State Government while recognizing the training institutes including the hotline training institutes shall strictly follow these guidelines.

8. The transmission utilities/organizations may provide incentive for their employees who have successfully completed hotline training as per these guidelines and are active in operation and maintenance of Transmission line.

CHAPTER-II

RECOGNITION OF THE TRAINING INSTITUTE

9. 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 following shall be the mandatory requirements for the recognition of training institute for Engineers, Supervisors and Technicians engaged for the Operation & Maintenance of Transmission systems :

(i) The training institute shall have a full time Principal/Director and teaching staff.

(ii) 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.

(iii) The training institute shall give an undertaking that on recognition for 3 years initially, the institute shall follow the curriculum as per these guidelines

(iv) The training institute shall have the facilities of providing training on simulator and slide shows & multimedia etc. The training institute shall have institutional tie up for simulator training/labs/workshops, if not having in-house.

(v) The training institute shall score a least 60% 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 term end 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 have basic medical facilities and high speed internet facilities in its premises.

(viii) The budget provision and control of expenditure for training program shall be distinctly and exclusively earmarked for the institute.

(3) The requisite fee for recognition of the 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) 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 has to submit the above-mentioned fee to the Authority for processing the application for its recognition.

(5) After receipt of the fee and complete application specified above, the team of CEA officers 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.

10. 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 its recognition furnishing the required information in the prescribed format enclosed **(at Form B**) for last three financial years separately.

(2) The following shall be the mandatory requirements for renewal of recognition of training institute for Engineers, Supervisors and Technicians engaged for the Operation & Maintenance of Transmission systems :

(i) The training institute shall have a full time Principal/Director and teaching staff.

(ii) 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.

(iii) The training institute shall have at least 2 faculties (core/empaneled/guest) in relevant specialized topics/subjects of the curriculum given in these guidelines.

(iv) The training institute shall have the facilities of providing training on simulator and slide shows & multimedia etc. The training institute shall have institutional tie up for simulator training/labs/workshops, if not having in-house.

(v) The training institute shall score at least 60% in the evaluation criteria for getting its recognition from the Authority.

(vi) The training institute shall be conducting induction course as per the curriculum given in these guidelines.

(vii) The training institute shall have CCTV facility at the examination hall for conducting the term end 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.

(viii) The training institute shall have basic medical facilities or shall have tie up 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 institute.

(3) The requisite fee for recognition of the 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) 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 has to submit the above-mentioned fee to Authority for processing the application for renewal of recognition

(5) After receipt of the fee and complete application specified above, the team of CEA officers 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.

(6) The training institutes applying for renewal of recognition after the date of expiry of earlier recognition shall be treated as institute seeking for fresh recognition and shall be charged a fee same as that for fresh recognition.

(7) 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.

11. Application for recognition (Fresh / Renewal) of Training Institutes with multiple Fields of Training: The Training institute applying for Fresh or Renewal for recognition in more than one field amongst Load Despatch, Generation, Transmission and Distribution and also in more than one category of Institutes, shall have to follow the following procedure provided that such fields of Training for all Categories of institutes 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 and also for such categories of Institutes as mentioned in the relevant Guidelines of CEA.

(3) The requisite fee for the Fresh or 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.

12. Parameters/Criteria for assessment of the training institute: The training institute shall ensure that 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 :

a) Central Power Sector Undertaking (CPSU) training institute shall be headed by an officer of Executive Director or equivalent level officer or above for category-I, General Manager (GM) or above for category-II & category-III.

b) State Sector institute shall be headed by an Chief Engineer or equivalent level officer for category-I, Superintending Engineer or above for category-II & category-III.
c) Private sector institute shall be headed by an officer having degree in Master in Business Administration (MBA)-HR with minimum relevant work experience of 18 years for category-I and 15 years for category-II and category-III.

(2) The training institute shall have adequate number of regular in- house teaching staff in the field of Transmission 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 areas of Transmission. Core Faculty shall also have undertaken at least one week training from an institute with all-India recognition in their area of knowledge at least once a year.

(2) The faculties 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 Faculties, the training institutes may empanel faculties with relevant experience in Transmission for delivering lectures/ imparting knowledge using simulator.

(5) Empaneled Faculties of an institute shall consist of the trainers who have delivered at least five lectures in a financial year in the institute.

(6) The external (Guest) faculties 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 Manufacturing units, Transmission Towers / Insulators/Conductors-Testing centers, 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.

(3) The trainee shall be imparted practical training on the site (or equivalent site), where the trainee is expected to be posted after training.

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/organization of Power Sector.

(2) The training calendar shall include Induction course and refresher course as outlined in these CEA guidelines.

VI. Term-End Exam

(1) After undergoing Induction course training the trainee shall have to successfully pass the term end exam.

(2) The term end exam shall be based on the model question banks based on the curriculum contained in these guidelines.

(3) The training institute shall maintain question banks on the basis of course for training for the personnel engaged in operation and maintenance of Transmission systems in consultation with the Central Electricity Authority and experts from the relevant fields.

(4) The examination shall be conducted under CCTV surveillance to make it fair and transparent.

(5) On-job performance may be measured through demonstrated capability to contribute towards taking major equipment in/out of service, handling unit emergencies, maintaining parameters within range, feedback after six months to the training Institute etc. Suggesting innovative methods to reduce the occurrence of the fault, adherence to safety norms.

(6) The term End exam shall carry weightage of 70% of theory and 30% of practical trainings, and the overall passing marks for the Term end exam (for both theory and practical) shall be 60%.

(7) The committee evaluating the performance of the trainees shall comprise of representative/s from training institute and a senior officer from the organization who has deputed the trainee.

(8) The format for certificate to be issued to trainees on successful completion of the training and for maintaining the records of training of personnel is given at Annexure-III.

13. Criteria/Norms for Recognition and Grading of Institute

(1) Recognition and Grading of institutes shall be made based on the information furnished by Institutes for last financial year as per Questionnaire enclosed at Form A and assessment of the visiting team of CEA for fresh recognition.

(2) Recognition and Grading of institutions shall be made based on the information furnished by Institutes for last three financial years separately as per Questionnaire enclosed at Form B and assessment of the visiting team of CEA for renewal of recognition.

(3) For institute seeking for fresh recognition, weightage and norms for each parameter/activity for appraisal shall be as under for the last financial year:

(i) For the Training Institutes without Hotline Training Facilities

S.No		Max. Score (a)	Score				remark
			(a*1)	(a*0.7)	(a*0.4)	(a*0)	Remarks
A.	**Infrastructure**						
(1)	No. of Classrooms	**5**	>=3	2	1	0	**Minimum one classroom**
(2)	E-Library	**1.5**	Yes	-	-	No	**E-Library shall have Journals and relevant Technical Standards etc.**
(3)	Laboratories/ Workshops (Meter & Testing Lab/ Protection Lab/ Transmission Line Testing / Transformer /Reactor Testing facilities at site / Supervisory Control And Data Acquisition (SCADA) Lab)	**10**	>=6	4-5	2-3	<2	**Weightage as per the number of labs out of the given list.**
(4)	Multi media Packages	**1.5**	>=20	>10	>0	0	
(5)	Models	**1**	>=20	>10	>0	0	
(6)	Simulator (Own/Tie-Up) (Transmission Simulator, Power System Simulation Lab , SCADA/Protection Simulator)	**5**	Yes	-	-	No	
(7)	**Quality of Infrastructure**	**6**					
(i)	Maintenance	1	Excel lent	Very Good	Good		
(ii)	Air-conditioning	1	Excel lent	Very Good	Good		
(iii)	Cleanliness/ Hygiene	1	Excel lent	Very Good	Good		
(iv)	No. of Facilities (Transport, Laundry, Gym ,Indoor/Outdoor Sports)	1	>=3	2	1	0	
(v)	High Speed Internet	1	Yes			No	

(vi)	Medical Facilities (First Aid/On-call Doctor/ Nursing Room/ Basic Medicines etc.)	1	Excel lent	Very Good	Good		Tie-up
	Sub Total	**30**					
B.	**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/simulation models made by Core Faculties	**2.5**	>=3	2	1	0	
	Sub Total	**35**					
C.	**Courses**						
(1)	Total Courses Conducted relevant to Power Sector (Days)	**15**	≥ 100	60-99	10-59	<10	
(2)	Total Simulator days (in % of total course conducted relevant to Power Sector in days)	**10**	≥ 1%	>0.7%	>0.5%	>0.3 %	
	Sub Total	**25**					
D.	Utilization of Budget (in %)	**10**	>=80	60-79	40-59	<40	
	Grand Total	**100**					

(ii) For the Hotline Training Institutes

S.No		Max. Score	Score				remark
		(a)	(a*1)	(a*0.7)	(a*0.4)	(a*0)	Remarks
A.	**Infrastructure**	**30**					
(1)	No. of Classrooms	**5**	>=3	2	1	0	**Minimum one classroom**
(2)	E-Library	**1.5**	Yes			No	**E-Library shall have Journals and relevant Technical Standards etc.**
(3)	Multi Media Packages	**1.5**	>=20	>10	>0	0	
(4)	Models	**1**	>=20	>10	>0	0	
(5)	**Experimental Line with facility to charge with 11 kV for Cold and Live Maintenance Training & Practice**	**9**					
(i)	**11kV Experimental Line with Pole** Double or Multi Circuit line with Pin and Disc Insulators at least 3 span and Dead end /H pole Configurations.	1.0	Yes			No	
(ii)	**33kV Experimental Line Pole/Tower** Single or Multi Circuit with lattice Structure with Pin and Disc Insulators.	1.0	Yes			No	
(iii)	**66kV Experimental Line with Tower** Single Circuit or Multi Circuit	1.0	Yes			No	

	Configuration with Suspension and Tension String Insulators of at least 2 Span lengths						
(iv)	**110kV/132 kV Experimental Line with Tower** Single Circuit or Multi Circuit Configuration with Suspension and Tension String Insulators of at least 2 Span lengths	2.0	Yes			No	
(v)	**220kV Experimental Line with Tower** Single/ Double Circuit / Multi Circuit Configuration with Suspension and Tension String Insulators of at least 2 Span lengths and at least one Double String configuration	2.0	Yes			No	
(vi)	**400kV Experimental Line with Tower** Single /Double Circuit / Multi Circuit Configuration with Suspension, V String and Tension String Insulators of at least 2 Span length with Twin Moose Conductor.	2.0	Yes			No	
(6)	**Specialized Tools for Hot Line Maintenance Training & Practice**	**6**					
(i)	Insulated Epoxy Glass Rods (with Metal Fittings) Complete Set for 220 kV Live Line Maintenance Training (LLMT)	1	Yes			No	
(ii)	Insulated Epoxy Glass , Ladders (with Metal Fittings)	1	Yes			No	

(iii)	Insulated Epoxy Glass , Scaffolding (with Metal Fittings)	1	Yes			No	
(iv)	Hot Line Chair (Epoxy Glass with Metal Fittings)	1	Yes			No	
(v)	Hot Line Cycle (Epoxy Glass with Metal Fittings)	1	Yes			No	
(vi)	Hot Man Suit (Conductive: Nomex & Stainless Steel) Complete set for 400 kV Bare Hand Method (BHM)	1	Yes			No	
	Sub Total	**15**					
8	**Quality of Infrastructure**	**6**					
(i)	Maintenance of Training Institute	1	Excellent	Very Good	Good		
(ii)	Air-Conditioning	1	Excellent	Very Good	Good		
(iii)	Cleanliness/ Hygienic	1	Excellent	Very Good	Good		
(iv)	No. of Facilities (Transport, Laundry, Gym ,Indoor/Outdoor Sports)	1	>=3	2	1	0	
(v)	High Speed Internet	1	Yes			No	
(vi)	Medical facilities (First Aid/On-call Doctor/ Nursing Room/ Basic Medicines etc.)	1	Excellent	Very Good	Good		
	Sub Total	**30**					
B.	**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	**2.5**	>=3	2	1	0	

	Conference or Seminars by Core Faculties and No. of Core Faculties Empaneled with other Institutes						
(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**					
C.	**Courses**						
	Total Courses Conducted relevant to Power Sector (Days)	**15**	≥ 100	60-99	10-59	<10	
	Total Live Line Maintenance Training (in % of Total Course conducted relevant to Power Sector in days)	**10**	≥ 1%	>0.7%	>0.5%	>0.3%	
	Sub Total	**25**					
D.	Utilization of Budget (in %)	**10**	>=80	60-79	40-59	<40	
	Grand Total	**100**					

(4) The institute seeking for renewal of recognition shall be considered for assessment for each parameter and activity for appraisal is as under for last three financial years separately:

(i) For the training institutes without hotline training centre

S.No		**Max. Score**	**Score**				**remark**
		(a)	**(a*1)**	**(a*0.7)**	**(a*0.4)**	**(a*0)**	**Remarks**
A.	**Infrastructure**	**30**					
(1)	No. of Classrooms	**5**	>=3	2	1	0	**Minimum One Classroom**
(2)	E-Library	**1.5**	Yes			No	**E-Library shall have Journals and relevant Technical Standards etc.**

(3)	Laboratories/ Workshops (Meter & Testing Lab/ Protection Lab/ Transmission Line Testing / Transformer /Reactor Testing facilities at site / SCADA Lab)	**10**	>=6	4-5	2-3	<2	**Weightage as per the number of labs out of the given list.**
(4)	Multi media Packages	**1.5**	>=20	>10	>0	0	
(5)	Models	**1**	>=20	>10	>0	0	
(6)	Simulator(Own/Tie-Up) (Transmission Simulator (Power System Simulation lab), SCADA/Protection Simulator)	**5**	Yes			No	
(7)	**Quality of Infrastructure**	**6**					
(i)	Maintenance of Training Institute	1	Excellent	Very Good	Good		
(ii)	Air-Conditioning	1	Excellent	Very Good	Good		
(iii)	Cleanliness/ Hygiene	1	Excellent	Very Good	Good		
(iv)	No. of Facilities (Transport, Laundry, Gym, Mess ,Indoor/Outdoor Sports)	1	>=3	2	1	0	
(v)	High Speed Internet	1	Yes			No	
(vi)	Medical facilities (First Aid/On-call doctor/ Nursing Room/ Basic Medicines etc.)	1	Excellent	Very Good	Good		
	Sub Total	**30**					
B.	**Faculty (Core +Empaneled + Guest)**						
(1)	Qualification of faculty	**7.5**	(No. of Ph.D.*7.5+No. of PG*6+No. of Graduates*4.5)/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 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	**30**					
C.	**Courses**						
(1)	Total Classroom part of Induction Courses Conducted (Days)	**10**	≥ 100	60-99	10-59	<10	
(2)	Total Refresher Courses Conducted (Days)	**2.5**	≥ 50	30-49	10-29	<10	
(3)	On-Job Training days (in % of total Induction Courses Conducted in days)	**2.5**	>=20%	>10%	>0%	0	
(4)	Total Simulator Training days (in % of total Induction Courses Conducted in days)	**5**	≥ 1%	>0.7 %	>0.5%	>0.3 %	
(5)	Average Score Obtained in Induction Course under CCTV surveillance	**10**	Average Score entered by institute (on the scale of 1-10)				
	Sub Total	**30**					
D.	Utilization of Budget (in %)	**10**	**>=80**	**60-79**	**40-59**	**<40**	
	Grand Total	**100**					

(i) For Hotline Training Institutes

S.No		Max. Score	Score				remark
		(a)	(a*1)	(a*0.7)	(a*0.4)	(a*0)	Remarks
A.	**Infrastructure**	**30**					
(1)	No of Classrooms	**5**	>=3	2	1	0	**Minimum one classroom**
(2)	E-Library	**1.5**	Yes			No	**E-Library shall have Journals and relevant Technical Standards etc.**
(3)	Multi media Packages	**1.5**	>=20	>10	>0	0	
(4)	Models	**1**	>=20	>10	>0	0	
(5)	**Experimental Line with facility to charge with 11 kV for Cold and Live Maintenance Training & Practice**	9					
(i)	**11KV Experimental Line with Pole** Double or Multi Circuit Line with Pin and Disc Insulators at least 3 span and Dead end /H Pole Configurations.	1.0					
(ii)	**33kV Experimental Line Pole/Tower** Single or Multi circuit with lattice Structure with Pin and Disc Insulators.	1.0					
(iii)	**66kV Experimental Line with Tower** Single Circuit or Multi Circuit Configuration with Suspension and Tension String	1.0					

	Insulators of at least 2 Span lengths						
(iv)	**110kV/132 kV Experimental Line with Tower** Single circuit or Multi Circuit Configuration with Suspension and Tension String Insulators of at least 2 Span lengths	2.0					
(v)	**220kV Experimental Line with Tower** Single/ Double Circuit / Multi Circuit Configuration with Suspension and Tension String Insulators of at least 2 Span lengths and at least one Double String configuration	2.0					
(vi)	**400kV Experimental Line with Tower** Single /Double circuit / Multi Circuit Configuration with Suspension, V String and Tension String Insulators of at least 2 Span length with Twin Moose Conductor.	2.0					
(6)	**Specialized Tools for Hot Line Maintenance Training & practice**	**6**					
(i)	Insulated Epoxy Glass Rods (with Metal Fittings) Complete set for 220 kV LLMT	1					
(ii)	Insulated Epoxy Glass , Ladders (with Metal Fittings)	1					
(iii)	Insulated Epoxy Glass , Scaffolding (with Metal Fittings)	1					
(iv)	Hot Line Chair (Epoxy Glass with Metal Fittings)	1					

(v)	Hot Line Cycle (Epoxy Glass with Metal Fittings)	1					
(vi)	Hot Man Suit (Conductive: Nomex & Stainless Steel) Complete set for 220 kV LLMT	1					
	Sub Total	15					
8	**Quality of Infrastructure**	**6**		**4**			
(i)	Maintenance of Training Institute	1	Excellent	Very Good	Good		
(ii)	Air-Conditioning	1	Excellent	Very Good	Good		
(iii)	Cleanliness/ Hygienic	1	Excellent	Very Good	Good		
(iv)	No. of Facilities (Transport,Laundry, Gym ,Indoor/Outdoor Sports)	1	>=3	2	1	0	
(v)	High Speed Internet	1	Yes		No		
(vi)	Medical facilities (First Aid/On-call Doctor/ Nursing Room/ Basic Medicines etc.)	1	Excellent	Very Good	Good		
	Sub Total	**30**					
B.	**Faculty (Core +Empaneled + Guest)**						
(1)	Qualification of Faculty	**7.5**	(No. of Ph.D.*7.5+No. of PG*6+No. of Graduates*4.5)/Total(Core+Empaneled+Guest Faculties)				
(2)	Experience of Faculty	**7.5**	(No of faculty Exp. more than 10yrs *7.5 + No of faculty 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	**30**					
C.	**Courses**						
(1)	Total Induction Courses conducted (Days)	**10**	≥ 100	60-99	10-59	<10	
(2)	Total Refresher Courses conducted (Days)	**2.5**	≥ 50	30-49	10-29	<10	
(3)	On-Job Training days (in % of total Induction Course conducted in days)	**2.5**	>=20%	>10 %	>0%	0	
(4)	Total Live Line Maintenance Training days (in % of total Induction Course conducted in days)	**5**	≥ 1%	>0.7 %	>0.5%	>0.3 %	
(5)	Average score obtained in Induction Course under CCTV surveillance	**10**	Average Score entered by institute (on the scale of 1-10)				
(6)	**Sub Total**	**30**					
D.	Utilization of Budget (in %)	**10**	**>=80**	**60-79**	**40-59**	**<40**	
	Grand Total	**100**					

(5) The institute seeking for fresh recognition shall furnish the above-mentioned required information for evaluation for last financial year. 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

(6) The overall grading for the renewal of recognition of training institute shall be given on the basis of computation of the final 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 30th June2023, then three years under consideration will be 2022-23(Y1), 2021-22(Y2) & 2020-21(Y3) having weightage of 0.5, 0.3 & 0.2 respectively)

(7) In case of fresh recognition, if the score obtained on evaluation by the training institute is at least 60, 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.

(8) 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.

(9) The training institute seeking for renewal of recognition shall be graded and recognized thereof for the period as under:

Score Obtained	Grading	Rating	Period of Recognition
>79	A	Excellent	5 years
70-79	B	Very Good	4 years
60-69	C	Good	3 years
< 60	---	Not qualified	---

(10) Based on the recommendations of the assessing team, the observations/recognition of the institute shall be communicated to the head of organization/ training institute.

(11) 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-A/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 or for the compliance of the observation within 60 days and by giving the opportunity for the training institute to be heard before the CEA.

(12) 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.

(13) The recognized training institutes shall update the data annually electronically or through the online portal.

(14) 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.

(15) The existing Training institute willing to change its category already recognized (i. e, from Category I to Category -II or Category-III or vice versa) shall have to apply again in Form-A, as applicable for Fresh application and the application of the institute shall be processed as Fresh application.

14. 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.

15. 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 Transmission 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-III

SYLLABUS FOR TRANSMISSION

16. STRUCTURE FOR CURRICULUM FOR OPERATION & MAINTENANCE OF ELECTRICAL INSTALLATIONS OF TRANSMISSION SYSTEMS

(1) After deliberations with the representative of CPSUs, few state and private utilities, the modified curriculum has been broadly defined so that it caters to the specific O&M need of the organization.
The mandatory courses, content, methodology and duration for Course is outlined below.

(2) Types of Courses

(i) **Induction Course** (**mandatory**)

a) **Common Courses** for all the trainees (including those undergoing hot line training)shall include the following:

a. Safety Management
   i. Overview of Safety Management
   ii. Causes and factors of accident
   iii. Statutory requirement
   iv. Firefighting equipment and Fire prevention
   v. First Aid
   vi. Safety in Material Movement, erection and commissioning of transmission lines

b. Values and Work culture , Conflict Management, Team Building
c. Relevant regulations and relevant sections of Electricity Act (EA) ((Measures Relating to Safety & Electric Supply) Regulations, 2023).
d. Necessary permissions/Clearances for commissioning and charging of new element
e. IT Applications and Cyber Security Awareness/overview
f. Disaster management
g. Electrical Vehicle Charging Infrastructure
h. Battery Storage
i. Renewable Energy Overview
j. Contracts and Materials Management
k. Project Management: Financing and Execution
l. Sustainability: Society, Environment & Economy (SSEE) , Mission LIFE- brief presentation and video shows
m. Resource Management: Reliability & Adequacy
n. Stores Management
o. Best Earthing Practices to be implemented for different Electrical Installations.

b) **Basic Courses** for Engineers, Diploma Holders and ITI personnel engaged in O&M work of the electrical installations in Transmission of Electricity. (given hereunder at section 17, 18 & 19) .

a. **Class Room Training**- Visuals/Media Usage for imparting training along with Models and Computer Based Training (CBT) packages to understand the Fundamentals

b. **Visits**-sites for understanding layout, identification of equipment, Manufacturing Units.

c. Practical

(i) **Operations**-through Simulators and Observer in control room for better understanding

(ii) **Maintenance-**

Practical /working with Engineers. It shall be ensured that the Degree/Diploma holder is rotated so that trainees observe and understand each activities such as

i. Preventive maintenance/ Schedule of maintenance
ii. Troubleshooting and repair
iii. Drawings and tracing the equipment's,
iv. Manuals,
v. Familiarizes with tools required for maintenance
vi. Live line maintenance-basics
vii. Testing
viii. Protection
ix. Safety Aspects
x. Team work with Diploma holders/ITI

(iii) **On job Training**

i. Drawings and tracing the wires/cables
ii. Preventive maintenance
iii. Extra High Voltage (EHV) transmission line construction, Stringing of conductors, Foundation, Placing of Insulators etc
iv. On job training on Live line maintenance-basics
v. Analyses of faults
vi. Calibration of equipment
vii. Quality of work done
viii. Team work with Diploma holders/ITI
ix. Process for permits and clearances
x. Mix of degree, diploma and ITI for building team work, improved communication and understanding.
xi. Awareness regarding Mock drill exercises considering various emergency situations may be added

c) Total Minimum Duration for Induction Training

(This includes Classroom Training, Simulator and On-Job Training/ Practicals)

	Total Duration (in weeks)	Duration (in weeks)		
		Classroom	Simulator	On-Job/Practicals
Engineers	6	3	1	2
Supervisor	4	2	1	1
Technician	2	1	1	

For Hot-Line training (as per the curriculum given at section 20), the duration is 11 weeks.

(ii) Refresher Course-

i. Substation Automation System (SAS) and Digital Substations
ii. Understanding and Troubleshooting for International Electro technical Commission (IEC) 61850 protocol.
iii. Substation transmission Asset management System (STAMS)

iv. Tele-Protection/ optical ground wire (OPGW), Synchronous Digital Hierarchy(SDH), Multiprotocol Label Switching (MPLS), Transmission Control Protocol/Internet Protocol (TCP/IP), very small aperture terminal (VSAT)
v. O&M of Power Line Carrier Communication (PLCC) and Network devices.
vi. Phasor measurement units (PMUs) and Wide area measurement system(WAMS)
vii. Condition Monitoring Techniques like partial discharge monitoring, thermography. Condition & life assessment Monitoring Techniques
viii. Renewable Energy Integration
ix. Cybersecurity, block chain, Image Processing artificial intelligence and edge computing
x. Advanced protection schemes like differential protection, overcurrent protection, and directional protection. Advanced software based protection system
xi. Asset management like life cycle cost analysis, reliability-centered maintenance, and risk-based maintenance
xii. Power System Stability including small-signal stability, transient stability, and voltage stability
xiii. Disaster Planning & Emergency Response Planning
xiv. Flexible alternating current transmission system (FACTS), High-voltage direct current (HVDC) and STATic synchronous COMpensator (STATCOM) STATCOM devices
xv. Grid Modernization
xvi. Smart Meters
xvii. Diagnostic testing and its detailed analysis.
xviii. Tower design and construction.
xix. Reconductoring with HTLS (High Temperature Low Sag) conductor
xx. Smart Grid concept in transmission
xxi. Power Quality Measurement
xxii. Gas Insulated Switchgear- Layout, Maintenance & troubleshooting
xxiii. Procurement, inventory & Store management.
xxiv. Supervisory Control and Data Acquisition (SCADA) for Transmission system.
xxv. Data Analysis related to sub-station monitoring and protection
xxvi. Safety Management in Transmission system
xxvii. Advanced software based protection system
xxviii. Latest Survey Techniques.
xxix. Cybersecurity, block chain, artificial intelligence and edge computing in Transmission system
xxx. Hotline maintenance: Recent trends and Practices
xxxi. Power System Operation: Demand Estimation, Monitoring & Control

The refresher Course for Hot-Line Training is mentioned at section 21 in these guidelines.

(3) As per clause 8 (3) of CEA Safety Regulation, 2023 the technicians assisting Engineers or Supervisors who do not have requisite qualification as mentioned in this regulation, shall have to undergo the training either from Power Sector Skill Council or from training institute recognized by the Authority. The same is reproduced as under:

*"**The Technicians to assist Engineers or Supervisors shall possess a certificate in appropriate trade, preferably with a two years course from an Industrial Training Institute recognised by the Central Government or State Government and should have successfully undergone the type of training as specified in guidelines as per sub regulation (4), within two years from the date of engagement or appointment:***

Provided that the existing employees, as on the date of notification of these regulations, who are extending technical assistance to Engineers or Supervisors and do not have

requisite qualification as mentioned in this regulation, shall have to undergo the training either from Power Sector Skill Council or from training institute recognised by the Authority for carrying out trade specific course as per the guidelines issued by the Authority and get certificate as mentioned above within two years from the date of notification of these regulations.”

The details of these courses are available on the site of power skill council. These courses are revised from time to time with the approval of National Council for Vocational Education Training (NCVET). The latest information regarding these courses can be seen at PSSC websites (psscindia.org)."

17. CURRICULUM FOR ENGINEERS ENGAGED IN THE OPERATION AND MAINTENANCE OF TRANSMISSION SYSTEM (“Basic Course” element of Mandatory Induction Course)

(i) General

a) Fundamentals of Power Systems- Overview of Generation, Transmission and Distribution Systems
b) Regulatory Framework in Power Sector, National Energy Policy
c) Power System Planning (Connectivity, Open Access & Detailed Project Report (DPR) examination)
d) Understanding Load Management and functioning of National Load Despatch Centre (NLDC)/ Regional Load Despatch Centre (RLDC)
e) Load Flow Studies, Reactive power calculations, Fault MVA, Power System Oscillations and Short circuit
f) Concept of Regulated tariff Mechanism (RTM) & Tariff Based Competitive Bidding (TBCB) and its challenges
g) Metering Concepts
h) Overview of Contracts Services (CS) Delegation of Power, Technical Proposals & WPPP
i) Statutory Clearances, Environmental Issues & Act/ Regulations, Challenges & Case Studies)
j) Cyber security and its importance in transmission system.
k) Materials & Store Management (Storage Procedure, Record Keeping, Audits, Formats & Software)
l) Load Despatch & Communication (PMUs, WAMs, REMC, SCADA, SDH, MPLS TC P/IP and Latest Technologies), Communication Protocols in Power Systems
m) Safety aspects and Regulatory requirements
n) Crisis and Disaster Planning and management
o) Best Earthing Practices to be implemented for different Electrical Installations

(ii) Sub-station Module

a) Digital Substation Module: Single Line Diagram (SLD), Layout, intelligent end devices (IEDs), bay control units (BCUs), Human Machine Interface (HMI), Gateways, firewall etc
b) Single Line Diagram, Layout of S/s, Switchyard & Control Room Layout, Switching Schemes, Earthing, S/s Civil Design - (a) Civil Works, (b) Structures (c) Civil drawings.
c) Asset Management Philosophy, Guidelines, Performances Indices
d) Insulation Co-ordination Studies
e) Transformer & Reactor - Design Aspects Commissioning of Transformers and Reactors, Constructional Details & Manufacturing , Conditioning Monitoring of Transformers & Reactors and interpretation of Results, Latest Advancement, Regulations/ Standards & Testing Procedures, Failure Analysis of Transformers & Reactors
f) Insulating Oil Testing & Dissolved Gas Analysis (DGA)
g) Introduction to Circuit Breakers – Design Considerations, Reference Standards, Condition Monitoring for Circuit Breakers including Circuit Switched Data (CSD) commissioning

h) Introduction to Instrument Transformers, Isolators & Lightning Arrestor (LA) including reference Standard, Condition Assessment of Instrument Transformers, commissioning, operational challenges & maintenance
i) Protection Philosophy and Basics of Fault Analysis, Distance Protection, Transformer & Reactor Protection, Transformer & Reactor Relay, Relay settings & Testing, Bus Bar Protection, Relay & Testing, Distance Relay & Testing including Travelling Wave Fault Locator, Auto Recloser & Advanced Protection, Trip Report Preparation, Tripping Analysis & Case Studies
j) Design of Earthing System and DSLP calculations
k) Green Substation Technologies. Pollution Control Measures
l) Assessment of Reactive Power requirement and Voltage control
m) Emergency handling and support for black start

(iii)Introduction to HVDC, static VAR compensator (SVC)& STATCOMs

a) Operational Aspects for SVC & STATCOMs
b) Series Compensation & FACTs devices
c) Introduction to SCADA and IEC 61850
d) Communication Systems in Sub-Stations including PLCC
e) Introduction to Gas Insulated Station Design Considerations, Standards and Challenges
f) GIS-Installation, Erection, Commissioning, Condition Assessment including PD
g) Understanding of Cable schedule
h) Understanding of Electrical Drawings, Schematics
i) DG Set, Illumination System, Battery and Charger, Fire Fighting
j) HT/LT Cables and LT Supply
k) HVDC - Principles Advantages over HVAC, HVDC Lines, Modes of Operation,
l) HVDC Station Equipment's (AC & DC Side equipment), RTDS and HVDC Studies, HVDC Control and Protection, HVDC-VSC
m) Valve Cooling system, Thyristor Valve Halls, Ventilation System Introduction to SVC & STATCOMs, Converter Transformers
n) Quality Assurance & Inspection (Inspections, MQP, Vendor Assessment and CIP/MICC) Field Quality Assurance

(iv) T/L, Civil and ERP Module

a) Basics of TL Design including provisions as per regulations/ standards, hands-on training on in-house TL
b) Basics of conductor & earth wire, HTLS conductor, Design considerations, Salient provisions of Technical specifications, standards & calculations
c) Basics of Insulator & hardware fittings , Design Considerations, Salient provisions of Technical specifications, standards, altitude correction & calculations
d) Preliminary Survey, Route Alignment & Profiling, Right of Way and Compensation Procedures including Differential Global positioning system (DGPS).
e) Concept of Tower Design including pole structures, narrow base towers, Single Line Diagram & Structural drawings
f) Detailed Survey, Profiling, Sag template curve, tower spotting, sag tension & stringing chart calculations, DGPS survey
g) Soil Investigation, Foundation Design & Classification and hands-on training on in-house design software, Foundation Construction Techniques.
h) Special Foundation including pile, pier , raft, tower footing protection
i) Tower Erection, Stringing, Testing and Commissioning
j) Conditioning Monitoring of Transmission Lines, Inspection Protocols for Civil Structures. Preventive Maintenance Practices

k) Emergency Restoration systems & Hotline Maintenance
l) Safety Aspects in Construction and O&M Demonstration of Patrolling techniques at S/S
m) Environment Impact Assessment - Mitigation Measures and Regulatory Compliance
n) Financial Aspect in Enterprise Resource Planning (ERP) for non-finance users. ERP modules relevant to Transmission Operations- Asset Management, Work Order Management, Inventory Procurement
o) Integration with SCADA and Monitoring Systems- Data Exchange Protocols, Real-Time Information flow.
p) Online Tendering through SRM ERP , Quality inspection, CIP, Mineral Insulated Copper Cable (MICC) through ERP
q) ERP Implementation and Maintenance
r) Renewable Energy Integration - Wind Power, Solar Power Plants. Challenges and Solutions. Grid Code Requirements
s) Electrical vehicles-load flow
t) Stringing and commissioning of transmission lines along with tower footing resistance and statutory requirement about transmission lines.
u) Regulatory Framework for Transmission Lines and Legal Aspects of Transmission Operation- Compliance with Grid Code, Interaction with Regulatory Authorities, Contract Management, Resolution of Disputes and Litigation
v) Adherence to Relevant Standards and Global Best Practices.

(v) Advanced Technologies in Transmission Systems

a) **Advanced Monitoring and Diagnostics -** Use of Drones for Inspection, Advanced Sensors and IoT in Transmission Systems
b) **Machine Learning and Predictive Analytics**- Application of AI for Fault Prediction, Data Analytics for Performance Optimization
c) **Cybersecurity in Transmission Systems**- Threats and Risks in Power Systems, Strategies for Securing Critical Infrastructure
d) **Global Trends and Innovations in Transmission System**- Case Studies from leading Transmission Networks

(vi) On Job Training- Operation/ Maintenance

Sub Station

a) Types of substations- AIS, GIS, Hybrid, HVDC. Layout, equipment familiarization. Switchgear and Bus bar systems.
b) Layout, equipment familiarization
c) Details, functioning, specification and different parameters of switchyard, control room, auxiliary system equipment
d) Shift handing/taking over, logging of parameters, routine checks on equipment/ systems
e) Operational aspects of equipment /systems, synchronization, grid operation, charging procedure
f) Line/feeder connections, protection schemes, loading aspects, etc.
g) Salient features and operational aspects of HVDC sub-station.
h) Visual checks, routine, preventive, planned, break-down maintenance of equipment/system.
i) Transformer, reactor, switchgear, relays, protection system and auxiliary facilities- Types, Ratings, Operations, Testing and Maintenance.
j) Maintenance schedules
k) Referring log books/history records for maintenance.
l) Testing Lab facilities, testing and commissioning.
m) Procedure for permit to work/line clear.
n) Safety devices and practices. Personal Protective Equipment Requirement, Hazardous Substance handling and Disposal

o) DC Earth fault rectification Emergency Response and Troubleshooting techniques. Fault Identification and Isolation
p) Measurement of soil resistivity and resistivity reduction methods
q) Advanced Substation Technologies- Digital Substations: Principles and Implementation, IoT and Sensors in Substation Monitoring, Cybersecurity Measures in Substations
r) Communication equipment operation and maintenance
s) Hot line maintenance basics: S/S and TL
t) Testing
u) Protection : Substation

(vii) T&D line maintenance/Cable Maintenance

a) Overview of Transmission and Distribution lines, Types of cables- Overhead, Underground and submarine.
b) Towers and Poles- Design, Inspection and Maintenance.
c) Line patrolling, thermovision scanning, hot spots, hardware replacement procedure, T&P.
d) Conductors and Insulators- Selection and Maintenance
e) Emergency Restoration System (ERS)
f) Industrial visits and evaluation

18. CURRICULUM FOR SUPERVISORS ASSISTING ENGINEERS ENGAGED IN THE OPERATION AND MAINTENANCE OF THE TRANSMISSION SYSTEM ("Basic Course" element of Mandatory Induction Course)

(i) Classroom Training

Part-A- Substation

a) Overview of Sub Station and Transmission line
b) Understanding various types of Bus bar arrangement at Substation along with its pros and cons
c) Best O&M practices in Substation and Transmission Lines
d) Contract Services (Focus on WPP)
e) Overview of AC Substations and Fixed series capacitor (FSC) & Thyristor-Controlled Series Capacitor (TCSC)
f) O&M of STATCOM and its principle
g) Safety in Construction and O&M for Substation and transmission line (video on Safety & Hygiene)
h) Best O&M practices in Substation and Transmission Lines
i) Basic Protection Philosophy for transmission line , Transformer , Reactor and Bus bar
j) Basic about Transformers & reactors including Maintenance aspect
k) Condition monitoring of switchyard equipment like Circuit breaker , current transformers , isolators , CVTs and Lightning arrestors along with Principle and its operation
l) Sub-station- Daily inspection for condition monitoring of various switchyard equipment including transformers /Reactors
m) Substation visit – AC & HVDC
n) Switchyard auxiliary system including Fire protection
o) HVDC principle and its O&M function
p) STATCOM site visit
q) Advanced Metering System
r) Regional Lab functions and visit
s) Field Quality Analysis (FQA), , Engineering
t) Renewable Energy power and its integration issue with Grid
u) Changing Power Generation Dynamics

v) Power System Communication and tele-protection
w) Role of PMUs, WAMs, SCADA, PLCC, RTUs etc in Grid management
x) Thermovision scanning of switchyard for detection of hot spot
y) Underground Cabling and its maintenance
z) Testing
aa) Protection
bb) Best Earthing Practices to be implemented for different Electrical Installations

Part-B- Transmission line -132kV and above

a) Transmission line basic concepts like type of towers , conductors and its associated hardware. Route survey of Transmission line to recognise the type of towers and voltage level of transmission line based on conductor configuration.
b) Statutory Clearances required for construction and charging of transmission line
c) Transmission line foundation – types and identification of various defects on foundation
d) Understanding PTW and isolation of transmission line before attending any transmission line defects
e) Tower top inspection of transmission line for checking any abnormality of insulators and hardware
f) Transmission line inspection – check list and its importance for transmission line
g) Measurement of TFR , clearance and performing Puncture insulator disc(PID) scanning
h) Measurement of hot spot through thermovision scanning
i) Demonstration of conductor compression jointing for mid span and dead end joints
j) Replacement of suspension and tension insulators
k) Use of safety equipment, practicals followed for permit on works(PTW)
l) Demonstration of discharge rod fixing and removal with safety aspect
m) Patrolling Norms and Records maintenance
n) Tower Climbing practice up to Bottom Cross arm
o) Tower Climbing practice up to Middle Cross arm
p) Tower Climbing practice up to Top Cross arm
cc) Tower Climbing practice up to Earth wire peak
dd) Introduction of HLM
ee) Introduction of ERS
ff) Introduction of T&P and its usage in TLM
gg) Crisis and Disaster Planning and management
hh) Hot line maintenance-basic

(ii) **On-Job Training-Operation/Maintenance**

a) Tan Delta measurement for ICT /Reactor
b) Measurement of current, voltage, power, energy, frequency and power factor
c) Operation of switchyard equipment through SCADA system
d) Isolation of 400/220/132 kV bus for maintenance alongwith application of discharge system
e) Measurement of hot spot through thermovision scanning
f) PID testing of transmission line insulators
g) Testing and connection of protective relays used for transmission line , transformer , Reactor and Bus Bar
h) Testing of PLCC and Digital tele protection system
i) Study of Buchholz relays, Pressure Relief Device (PRD) and breather
j) Measurement of earth resistivity
k) Measurement of Circuit breaker timing and Dynamic Contact Resistance Measurement (DCRM)
l) Measurement of transformer winding resistance, turn ratio , C & Tan delta of winding and bushing
m) Insulation measurement of installation and equipment's
n) Study of "on load tap changer" for transformer
o) Study of line construction materials and hardware

p) Demonstration of conductor jointing for mid span and dead end Conductor fault location identification and repair.
q) Understanding & Demonstration of cable laying, cable glanding , termination & ferruling
r) Use of diagnostic tools
s) Patrolling of transmission line.
t) Study of various type of power fuses, control fuses, kitkat and horn gaps.
u) Use of safety equipment and practical followed for permit on works
v) First aid and fire-fighting drills

19. CURRICULUM FOR TECHNICIANS ASSISTING SUPERVISORS ENGAGED IN OPERATION AND MAINTENANCE OF TRANSMISSION SYSTEM ("Basic Course" element of Mandatory Induction Course)

Qualifications- ITI (2 years Course) OR Experienced based employee at equivalent level

a) Over view of Substation construction , Operation and Maintenance, Transmission Line construction, Transmission Line Operation and Maintenance

b) Operation/Maintenance

Part-A- Substation

a) Sub-station - 132 kV and above
b) Sub-station- Daily inspection for condition monitoring of various switchyard equipment including transformer /Reactor.
c) Thermovision scanning of switchyard for detection of hot spot .
d) Transformer/ Reactor Maintenance including its accessories like electrical and mechanical relays
e) Condition monitoring of switchyard equipment like Circuit breaker , current transformer , isolators , CVT and Lightning arrestor alongwith Principle and its operation
f) Measurement of current, voltage, power, energy, frequency and power factor
g) Testing and connection of various protection relays like transmission line , transformer /Reactor , Bus bar protection
h) Measurement of earth resistivity for transformer / reactor neutral earth pit
i) Insulation testing of switchyard equipment and its importance
j) Operation and its maintenance of Auxiliary system like ACLT , DCDB , DG set , Fire protection system operation and its maintenance Video monitoring system , Illumination system
k) Understanding & Demonstration of cable laying , cable glanding , termination & ferruling
l) Study of various type of power fuses, control fuses and horn gaps and its application
m) Demonstration of discharge rod fixing and removal with safety aspect
n) Role of Permit to work(PTW) and Sanction for test (SFT) before taking any maintenance activities in switchyard
o) Condition monitoring, calibration and handling of various measuring testing equipment and Tools & Plant
p) Best Earthing Practices to be implemented for different Electrical Installations

Part-B- Transmission line -132kV and above

Transmission line basic concepts like type of towers , conductors and its associated hardware. Route survey of Transmission line to recognise the type of towers and voltage level of transmission line based on conductor configuration.

a) Transmission line foundation – types and identification of various defects on foundation
b) Understanding Permit to Work (PTW) and isolation of transmission line before attending any transmission line defects
c) Tower top inspection of transmission line for checking any abnormality of insulators and hardware
d) Transmission line inspection – check list and its importance for transmission line
e) Measurement of TFR , clearance and performing Puncture insulator disc(PID) scanning
f) Measurement of hot spot through thermovision scanning
g) Demonstration of conductor compression jointing for mid span and dead end joints
h) Replacement of suspension and tension insulators
i) Use of safety equipment, practical's followed for permit on works(PTW)
j) Demonstration of discharge rod fixing and removal with safety aspect

k) Tower Climbing practice up to Bottom Cross arm
l) Tower Climbing practice up to Middle Cross arm
m) Tower Climbing practice up to Top Cross arm
n) Tower Climbing practice up to Earth wire peak

20. Curriculum for Hot-line Training (Total Duration: 11 weeks)

Training Module -Live Line Maintenance using Hot Stick Method (Replacement of insulators of Suspension String/Tension String/V String of 66 kV, 110 kV/132, 220kV using Hot Stick Method)

Session 1: Tower Climbing and Tower Patrolling

a) This training on tower climbing is generally aimed at those persons new to the tower climbing and provides a solid base for safe working on towers during transmission line maintenance work.
b) Those attending are equipped with the key information, knowledge and practical skills required to work safely on tower using personal protection equipment (PPEs)
c) Course Objectives & Content
- To get rid of fear of tower climbing
- Climbing of tower and movement on tower with safety
- To provide knowledge about different parts of transmission line towers
- To know about the different T&Ps required for maintenance of transmission lines
- General transmission line maintenance and safety practices

d) Prerequisites
All Technicians/JE/AE/ET. Those attending should be medically fit

e) This Tower Climbing training course uses a combination of classroom and hands-on fieldwork to train workers/supervisors/ETs for tower climbing and for safe working on height.

a. Introduction of various T&Ps required for live line transmission line maintenance activities
b. Importance of various personnel protective equipment's /safety gears used during transmission maintenance activities
c. Uses of double lanyard safety belts/safety helmets/safety shoes with the its benefits during tower climbing
d. Use of mobile fall arrester and retractable fall arresters
e. Introduction to various hardware fittings and its assembly
f. Demo of photography/TFR/Laser finder/PID/Thermo-scanning/ PG- Darp
g. Demonstration of tower climbing
h. Tower climbing training up to waist level
i. Tower climbing training up to cross arm level
j. Horizontal movement (cross arm to cross arm) on the tower with proper anchoring of double lanyard
k. Tower climbing training up to earth peak level
l. Tower climbing training with dummy load of (5-10 KG)
m. Earthing arrangements (how to fix discharge leads with discharge rod)
n. Copper bond/earth wire jumper checking
o. Fixing of loose copper bonds/earth wire jumpers
p. Safety aspects and Regulatory requirements
q. First Aid,

r. Electrical safety,
s. Fire fighting etc

f) (class room training)
   a. Patrolling Norms of 220/400/765/800 KV lines
   b. Importance of patrolling of lines and procedures
   c. Emergency patrolling procedures
   d. Methods of preventive maintenance
   e. Photography of lines
   f. Thermos canning of lines
   g. PID of lines
   h. Clearance measurement of lines
   i. TFR measurement
   j. Fault finding of lines

g) Evaluation of participants on the basis of following:
   a. Their practical performance of tower climbing
   b. Duration of tower climbing
   c. Adoption of safety practices during tower climbing
   d. Interest level during training program

h) After completing this course, the participants will understand and be capable for
   a. Tower climbing
   b. Working on transmission line towers with safety
   c. Uses of personal protective equipment's
   d. General transmission line maintenance

Session- 2 (Class Room Session for insulator replacement)

a) Need of insulator replacement
b) Various causes of insulator failure
c) Introduction to various T&P required for replacement of suspension insulators
d) Purpose/usage of all the T&P required for insulator replacement
e) Ground arrangement required for suspension/tension/ V String insulator replacement
f) Uses of safety gears such as retractable fall arrester.

Session-3 (Practical Session on Experimental Line 66 kV, 110 kV/132, 220 kV in Cold Condition)

a) Climbing of tower with required T&P
b) Safe movement on cross arms with T&P
c) Use of PID to identify faulty/defective
d) Fixing of pulleys, uses of metal/polyester slings
e) Uses of chain hoist/ratchet
f) Uses of Epoxy Glass Hot Stick and other tools
g) Taking of load of Suspension String /Tension String /V String using Epoxy Glass Hot Stick
h) Fixing of Static Shunt between tower to the Insulator String if needed
i) Removal of Complete Insulator String using Epoxy Glass Hot Stick
j) Bringing Complete Insulator String to Ground
k) Removal of faulty insulator from Insulator String

l) Fixing of new insulator (porcelain/glass insulators/polymer Insulators) in Insulator String
m) Taking Complete Insulator String to its original location
n) Fixing/Replacement of whole suspension string
o) Removing the Tools and Tackles from the tower and sending them to the ground

Session- 4 (Practical Session on Experimental Line on 66 kV, 110 kV/132, 220 kV after charging with 11 kV supply)

a) Climbing & Movement on tower & cross arms with T&P
b) Use of PID to identify faulty/defective
c) Fixing of pulleys, uses of metal/polyester slings
d) Uses of Epoxy Glass Hot Stick & chain hoist/ratchet and other tools
e) Taking of load of Suspension String /Tension String /V String using Epoxy Glass Hot Stick
f) Fixing of Static Shunt between tower to the Insulator String if needed
g) Removal of Complete Insulator String using Epoxy Glass Hot Stick
h) Bringing Complete Insulator String to Ground
i) Removal of faulty insulator from Insulator String
j) Fixing of new insulator (porcelain/glass insulators/polymer Insulators) in Insulator String
k) Taking Complete Insulator String to its original location
l) Fixing/Replacement of whole suspension string
m) Removing the Tools and Tackles from the tower and sending to the Ground

Session- 5 (Practical Session on Live Line/ Commercial Line 66 kV, 110 kV/132, 220 kV in fully charged Condition)

a)
b) Climbing on tower and going on the cross arms with T&P
c) Use of PID to identify faulty/defective
d) Fixing of pulleys, uses of metal/polyester slings
e) Uses of Epoxy Glass Hot Stick & chain hoist/ratchet and other tools
f) Taking of load of Suspension String /Tension String /V String using Epoxy Glass Hot Stick
g) Fixing of Static Shunt between tower to the Insulator String if needed
h) Removal of Complete Insulator String using Epoxy Glass Hot Stick
i) Bringing Complete Insulator String to Ground
j) Removal of faulty insulator from Insulator String
k) Fixing of new insulator (porcelain/glass insulators/polymer Insulators) in Insulator String
l) Taking Complete Insulator String to its original location
m) Fixing/Replacement of whole suspension string
n) Removing the Tools and Tackles from the tower and sending to the Ground

21. Refresher Course Training Module- Live Line Maintenance using Bare Hand Method (05 Weeks)
(Replacement of insulators of suspension string/tension string/V string 400 kV using Bare Hand Method)

(This training module is a refresher course and the trainees can undergo this training programme only after they have undergone the 11 week induction

training as mentioned at section 21 and have relevant working experience of at least 2 years.)

Session-1

a) Purpose/usage of all the T&P required for insulator replacement
b) Ground arrangement required for Suspension String /Tension String /V String insulator replacement
c) Uses of safety gears such as retractable fall arrester etc.

Session-2 (Practical Session on Experimental Line 400kV in Cold Condition)

a) Climbing of tower with required T&P
b) Safe movement on cross arms with T&P
c) Fixing of pulleys, uses of metal/polyester slings
d) Uses of chain hoist/ratchet
e) Uses of Epoxy Glass Hot Stick and other tools
f) Sending Hot man near to the Live Conductor by Epoxy glass Ladder /Hot Line Chair
g) Taking of load of Suspension String /Tension String /V String using Epoxy Glass Hot Stick
h) Fixing of Static Shunt between tower to the Insulator String if needed
i) Removal of Complete Insulator String using Epoxy Glass Hot Stick
j) Bringing Complete Insulator String to Ground
k) Removal of faulty insulator from Insulator String
l) Fixing of new insulator (porcelain/glass insulators/polymer Insulators) in Insulator String
m) Taking Complete Insulator String to its original location
n) Fixing/Replacement of whole suspension string
o) Taking Hot man back from Live conductor
p) Removing the Tools and Tackles from the tower and sending to the Ground

Session-3 (Practical Session on Experimental Line on 400 kV after charging with 11 kV supply)

a) Climbing of tower with required T&P
b) Safe movement on cross arms with T&P
c) Fixing of pulleys, uses of metal/polyester slings
d) Uses of chain hoist/ratchet
e) Uses of Epoxy Glass Hot Stick and other tools
f) Use of Hot Man Suit
g) Sending Hot Man near to the Live Conductor using Epoxy glass Ladder /Hot Line Chair
h) Practice of Hot Man for touching & come back on live conductor
i) Taking of load of Suspension String /Tension String /V String using Epoxy Glass Hot Stick
j) Fixing of Static Shunt between tower to the Insulator String if needed
k) Removal of Complete Insulator String using Epoxy Glass Hot Stick
l) Bringing Complete Insulator String to Ground
m) Removal of faulty insulator from Insulator String
n) Fixing of new insulator (porcelain/glass insulators/polymer Insulators) in Insulator String
o) Taking Complete Insulator String to its original location
p) Fixing/Replacement of whole suspension string
q) Taking Hot man back from Live conductor

r) Removing the Tools and Tackles from the tower and sending to the Ground

Session-4 (Practical Session on Live Line/ Commercial Line 400 kV in fully charged Condition)

a) Climbing of tower with required T&P
b) Safe movement on cross arms with T&P
c) Fixing of pulleys, uses of metal/polyester slings
d) Uses of chain hoist/ratchet
e) Uses of Epoxy Glass Hot Stick and other tools
f) Use of Hot Man Suit
g) Sending Hot Man near to the Live Conductor using Epoxy glass Ladder /Hot Line Chair
h) Practice of Hot Man for touching & come back on live conductor
i) Taking of load of Suspension String /Tension String /V String using Epoxy Glass Hot Stick
j) Fixing of Static Shunt between tower to the Insulator String if needed
k) Removal of Complete Insulator String using Epoxy Glass Hot Stick
l) Bringing Complete Insulator String to Ground
m) Removal of faulty insulator from Insulator String
n) Fixing of new insulator (porcelain/glass insulators/polymer Insulators) in Insulator String
o) Taking Complete Insulator String to its original location
p) Fixing/Replacement of whole suspension string
q) Taking Hot man back from Live conductor
r) Removing the Tools and Tackles from the tower and sending to the Ground

Session-5

Evaluation of participants on the basis of following

- Their practical performance during training
- Adoption of safety practices during Insulator replacement and other activities
- Interest level during training program

ANNEXURE-I

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 8 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 pertaining to personnel engaged in O&M of Transmission Systems

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. **Field of training** : Transmission of Electricity/Hot line Training

2. **Category of Institute : (Tick mark appropriately)**

Category -I : Training for Engineers	
Category –II : Training for Supervisors	
Category –III : Training for ITI qualified / Non-qualified technicians	

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

4. **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 give an undertaking that on recognition for 3 years initially, the institute shall follow the curriculum as per these guidelines	
(4)	The training institute shall have the facilities of providing training on simulator and slide shows & multimedia etc. The training institute shall have institutional tie up for simulator training/labs/workshops, if not having in-house.	
(5)	The training institute shall have CCTV facility at the examination hall for conducting the term end 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.	
(6)	The training institute shall have basic medical facilities and high Speed Internet facilities in its premises.	
(7)	The training institute shall score a least 60% in the evaluation criteria for getting its recognition from the Authority.	
(8)	The budget provision and control of expenditure for training program shall be distinctly and exclusively earmarked for the institute.	

5. Annual Training Capacity of the Institute (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):

(1) 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	

(2) Laboratories/Workshops including computer labs / Hot Line Experimental Line & Live Line tools for Hot Line Maintenance Practice (for Hot Line Training Institute)
Details to be attached as per the format given below:

S.no.	Type and No. of Laboratory/Workshop/ Hot Line Experimental Line & Hot Line tools

(3) Details of Hostel Facilities:

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.

(4) Details of Simulators:

Number and details of each Simulator for training relating to Transmission system to be attached.

(5) Details of Library/E-library:

E- Library Yes/No

Details of Books	Nos. (Pls mention whether available in Library or E-Library)
Technical books	
Standards-BIS,IEC etc	
CEA Regulations and Standards	
SERC Regulations	
No. of Journals	

(6) Model Room Yes/No

If yes, then enclose the number of models and their list.

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

Sl. No.	Subject	Numbers	Remarks

(8) Whether the Training Institute has e-integration with other Training Institute/s within the organization or with other organizations: Yes/ No

If yes, then attach the list with the details.

(9) Whether the training institute has linkage with the sub-station 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.

(10) Do you have an officer designated as an On-job Trainer? Yes/No

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

(11) Auditorium/Conference Hall Yes/No

If yes, then mention Seating Capacity:

(12) Reprographic Facilities /Resource Centre Yes/No

If yes, attach the list with details.

(13) Quality of Infrastructure as rated by the 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) Hot Line Experimental Line (11 kV,33 kV, 66 kV, 132 kV, 220 kV 400 kV)
Hot Line Maintenance Practice (Excellent / Very Good/ Good)

(e) Hot Line/Live Line tools for Hot Line Maintenance Practice (Excellent / Very Good/ Good)

(f) 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 ☐

8. **Faculty:**

(1) Details of Faculty (Core Faculty + Empaneled Faculty + Guest Faculty) for training shall be furnished by the applicant for the financial year. 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:

	Numbers			Qualification wise(nos.)				No. of Core Faculty trained during the year
Total	Core*	Empaneled*	Guest*	Diploma	Degree	PG	Ph.D.	

** as defined in the guidelines*

(3) Experience:

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

(ii) No. of faculty 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 in 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 financial year to be provided in the format given below:

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

(2) The no. of courses and the no. of person 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	No. of Persons trained	Days
1.	Theory Course *		
2.	Simulator training		
3.	On-job training		

*Online training shall be included in the ***Theory Course.***

10. **Training Methodology**

(i) Classroom Lectures Yes/No
(ii) Group Discussion Sessions Yes/No
(iii) On-job Training Yes/No
(iv) Case Studies and presentation By each trainee Yes/No
(v) Hot Line Maintenance Practice (for Hot Line Training Institute) Yes/No

(Enclose the Details)

11. **Instructional capability**

(1) Has the the Core faculty been adequately trained in the instructional technique for the F.Y.? Yes/No
If yes,

Name of the Core Faculty Member	Training in instructional techniques			
	At Institute (Name)	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

Annexure-II

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 8 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 pertaining to personnel engaged in O&M of Transmission Systems

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. **Field of training** : Transmission of Electricity/Hot Line Training

3. **Category of Institute : (Tick mark appropriately)**

Category -I : Training for Engineers	
Category -II : Training for Supervisors	
Category –III : Training for ITI qualified / Nonqualified technicians	

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

5. **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 have at least 2 faculties (core/empaneled/guest) in relevant specialized topics/subjects of the curriculum given in these guidelines.	
(4)	The training institute shall have the facilities of providing training on simulator and slide shows & multimedia etc. The training institute shall have institutional tie up for simulator training/labs/workshops, if not having in-house.	
(5)	The training institute shall conduct induction course as per the curriculum given in these guidelines	
(6)	The training institute shall have basic medical facilities or shall have tie up and high speed internet facilities in its premises.	
(7)	The training institute shall have CCTV facility at the examination hall for conducting the term end 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 score a least 60% in the evaluation criteria for getting its recognition from the Authority.	

(9)	The budget provision and control of expenditure for training program shall be distinctly and exclusively earmarked for the institute.	

6. Annual Training Capacity of the Institute (in days)
7. Annual Budget provisions for Training:

(Rupees in lakh)

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

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

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

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

(2) Laboratories/Workshops including computer labs/ Hot Line Experimental Line & Hot Line tools for Hot Line Maintenance Practice (for Hot Line Training Institute) .

Details to be attached as per the format given below:

Sl. No.	Type of laboratory / Workshop/Hot Line Experimental Line & Hot Line tools

(3) Details of Hostel Facilities:

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.

(4) Details of Simulators:

Number and details of Simulators for training relating to Transmission systems to be attached.

(5) Details of Library/E-library:

E- Library Yes/No

Details of Books	Nos . (pls mention whether available in Library or E-Library)
Technical books	
Standards-BIS,IEC etc	
CEA Regulations and Standards	
SERC regulations	
No. of Journals	

(6) Model Room Yes/No

If yes, then enclose the number of models and their list.

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

Sl. No.	Subject	Numbers	Remarks

(8) Whether the Training Institute has e-integration with other Training Institute/s within the organization or with other organizations: Yes/ No

If yes, then attach the list with the details.

(9) Whether the training institute has linkage with the sub-station 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.

(10) Do you have an officer designated as an On-job Trainer? Yes/No

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

(11) Auditorium/Conference Hall Yes/No

If yes, then Seating Capacity

(12) Reprographic Facilities /Resource Centre Yes/No

If yes, attach the list with details.

(13) 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) Hot Line Experimental Line (11 kV,33 kV, 66 kV, 132 kV, 220 kV 400 kV)

Hot Line Maintenance Practice (Excellent / Very Good/ Good)

(e) Hot Line/Live Line tools for Hot Line Maintenance Practice (Excellent / Very Good/ Good)

(f) 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 ☐

(14) 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 Course Completion by the trainees. (Course Type-wise):

9. **Faculty:**

(1) Details of Faculty (Core Faculty + Empaneled Faculty + Guest Faculty) for training shall be furnished by the applicant for the financial year. 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:

	Numbers			Qualification wise(nos.)				No. of Core Faculty trained during the year
Total	Core*	Empaneled*	Guest*	Diploma	Degree	PG	Ph.D.	

* *as defined in the guidelines*

(3) Experience:

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

(ii) No. of faculty 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 in National or International body of the training institute	1. 2. 3. ……..
(4)	Working models or simulation models made by Core Faculties	1. 2. 3. ……..

10. **Training Courses**

(1) The courses conducted during the financial year 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)**	**No. of Trainees**	**Total Days**
	Name of Course(Induction/Refresher) 1. 2. …… Sub-total				
	Training on Simulator 1. 2. …….. Sub-total				

	On-job training at sub-station 1. 2. ……. Sub-total				
	Total				

(2) The no. of courses and the no. of person trained during the financial year 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 financial year:

Sl. No.	Type of Course	No. of Persons trained.	Days
1.	Induction		
2.	Refresher		
3.	Simulator training		
4.	On-job training		

*Online training shall also be included in these courses

Are Courses in line with the Guidelines: yes/No

11. **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
(v) Hot Line Maintenance Practice (for Hot Line Training Institute) Yes/No

(Enclose the Details)

12. **Instructional capability**

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

If yes,

Name of the Core Faculty Member	Training in instructional techniques			
	At Institute (Name)	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

13. Whether the training institute is following the curriculum provided in the CEA guidelines?
Yes / No

14. Whether the training institute is conducting the term end exam as mentioned in the CEA guidelines?
Yes / No

15. Specific details for the Training program to be provided for each program for the F.Y.:
(1) Average score obtained by the trainees in **Induction Course Term End Exam**.
(2) Average score obtained by the trainees in **Refresher Training Term end Exam.**

Date: Signature of Head of the Training Institute with Office Stamp/Seal

ANNEXURE-III

Formats/Forms for Record of Induction training of the Engineers/Supervisors/Technician of the Transmission Utility/Organization (To be maintained by the concerned Transmission Utility/Organization)

S. No	Name of the Employee	Aadhar No.	Designation & Section/ Division of posting	Date of Engagement	Name of the Training Institute	Course Name Date	Certificate Date & No.	Score obtained in Term-End Exam (in %)

Certificate by the head of the Transmission Utility/Organization

It is certified that all the engineers/supervisors/Technicians engaged have been trained as per the guidelines issued by Central Electricity Authority in line with the Regulation 8(4) of (Measures relating to Safety and Electric Supply) Regulations, 2023. The records of their assessment has been maintained as per the format mentioned in the Guidelines.

Date Head of the Transmission Utility/Organization

Certificate by the Training Institute

This is to certify that Shri/Ms._____ Aadhar no._____ has successfully completed Training Course in **Transmission** which is in accordance with the Curriculum mentioned in the Guidelines issued by Central Electricity Authority in line with the Regulation 8(4) of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023.

Date Head of the Training Institute.