Proposal for Certification of personnel involved in planning at CTU and STU

Hon’ble Commission under Regulation 11 of the CERC (Planning, Coordination and Development of Economic and Efficient Inter-State Transmission System by Central Transmission Utility and other related matters) Regulations, 2018 has made mandatory upon CTU in consultation with STUs to prepare a scheme for certification of personnel involved in planning at CTU and STU and submit to the Commission for approval. In this regard following has been stated in the Regulations:

“CTU and STU shall ensure proper and adequate manpower for conducting transmission planning exercise. CTU, in consultation with STUs shall prepare a scheme for certification of personnel involved in planning at CTU and STU and submit to the Commission for approval.”

In view of the above, draft proposal for certification of Power System Planners has been prepared and the same is uploaded on CTU website for suggestions/observations of STUs. STUs are requested to give their suggestions/observations within 45 days. The draft proposal is enclosed at Annexure-I.
PROPOSAL FOR POWER SYSTEM PLANNERS CERTIFICATION SCHEME

Title: “Power System Planners Certification”

Background:
As per Regulation 11 of CERC (Planning, Coordination and Development of Economic and Efficient Inter-State Transmission System by Central Transmission Utility and other related matters) Regulations, 2018, CTU and STU shall ensure proper and adequate manpower for conducting transmission planning exercise. In this direction, CTU in consultation with STU is required to prepare a scheme for certification of personnel involved in planning at CTU and STU.

Introduction:
Transmission plays a vital role in development of power system to facilitate seamless power transfer from generation to the bulk load centres/consumers, addressing congestion in the network, system operational aspects etc. Complexity of power system has grown with an increased penetration of renewable energy accompanied with their remote locations from the load centres. With the increasing complexity of power systems, it is required to have skilled manpower for reliable and efficient planning & development of power system.

Section 66 of Electricity Act 2003 mandates the development of a power market. Same has been echoed in Section 5.7.1 of the National Electricity Policy. This has introduced non-discriminatory open access in the country to promote competition in the power market with the objective of bringing about efficiency in the Sector. It has resulted in development of a vibrant power market.

For evolution of an efficient and reliable transmission system, planners are required to formulate different load-generation scenarios, carry out various system studies and its analysis for different scenarios satisfying transmission planning criteria, regulations etc. Therefore, Planners must be accustomed with simulation/modelling tools used for different studies. They are required to have appropriate knowledge of planning process, policy/regulatory provisions, modelling of power system equipment’s in simulation software, preparation of load-generation scenario, new technologies & its application in power system and carrying out load flow, short circuit studies, dynamic, transient studies. Planners must be aware of latest design of transmission lines and substations, protection & control aspects, characteristics of various equipment as well as various regulatory provisions.

In light of the changing power system requirements, evolving technologies, changing system characteristics & challenges in integration of variable / renewable energy sources, it becomes very important to introduce scheme of certification of System Planners for enhancing knowledge/skill of system planning for carrying out above activities. The Scheme may cover the following areas:

- Power System Planning
- Open Access
- System Operation and maintenance
- Regulatory framework (Policies and Legal framework)
- Reasoning and analytical traits
Certification Procedure:

In this context, it is prudent that the certification agency may conduct two week residential training programme (on payment basis) on the subject matter and the online examination for certification on periodic basis (yearly). After completion of the training programme, participants are required to register themselves for the online exam. The registration shall be conducted for the certification examination on yearly basis. Participants qualifying the exam shall be given certificate of qualified power system planner by the certifying agency. The certificate shall be valid for period of four years and shall be renewed by the certifying agency based on certificate of experience after expiration and appearance in online exam. This shall encourage planners to be updated with their knowledge & skill. Some online examination centres shall be selected by the certifying agency and the applicants would be allowed to take this examination at the centre of their choice. Further, planners are required to attend one week refresher course on power system planning every 2 years.

Eligibility: All employees of CTU and STU shall be eligible to appear in this examination by filling a registration form that shall be duly endorsed by the competent authority of the respective organization where he/she is employed. The registration can be done by submission of duly filled registration form to be developed by certifying agency.

Fee: In order to cover the expenses for organizing this examination a nominal registration fee per participant inclusive of GST may be kept. The fee may be paid by the organization (STU/CTU) where the applicant is employed / sponsoring organization. This fee is to be deposited by the online payment mode along with the filled registration form.

Responsibility: A Committee comprising members from CTU, STU, CEA & Premier Academic institute may be constituted for preparation of course module and question bank. However, Certifying agency shall be responsible for setting of exam questions. The question paper will consist of multiple choice type objective questions to be answered in the stipulated time. The question paper will test the applicants on the power system planning, Regulatory framework, power market, system operation & maintenance, reasoning & analytical abilities. All questions shall carry equal marks and there shall be no negative marking. Certifying agency shall evaluate the examination and applicants would be qualified for awarding certificate or disqualified as per defined terms and conditions. The results shall be declared by certifying agency within three weeks of the date of the examination and certifying agency shall communicate the results to the applicants as well as the sponsoring organization, if applicable.

Further, there shall be a Committee comprising member from CTU, STU, CEA & premier academic institute for review of certification process and course content after every 2 years.

Thus, certifying agency shall be responsible for:

1. Preparation of course module and study material
2. Carrying out registration of candidate, issue of on line admit card, conducting Examination for “Power System Planner Certification”
3. Declaring exam result on-line, awarding certificate based on evaluation of the test, identifying nodal coordinator & dispute resolution
4. Maintaining database for certified planners
5. Residential training of power system planning professionals

Pattern of Examination:

Examination paper may be set after taking input from experts in various fields. The certification exam question paper shall comprise total one hundred (120) objective-type multiple-choice questions spread over five sections. The total time allowed for answering would be two and half hours (150 minutes). There shall be equal number of questions in all the five sections and
all the questions shall carry equal marks without any negative marking. A clock would be displayed on the screen at all times indicating the time remaining. The candidate has to submit his answers at the last by clicking on submit button if he completes the examination before the allotted time. After expiry of allotted time, even if the candidate has not pressed submit button, the system would automatically consider the status till then as submitted. The pressing of the submit button would be considered as the completion of the examination. The time allocation for the proceedings at the exam centre would be as under:

<table>
<thead>
<tr>
<th>EXAMINATION STAGES</th>
<th>TIME ALLOCATION</th>
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<tbody>
<tr>
<td>Administration and review of the candidate identification</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Computer based tutorial</td>
<td>10 minutes</td>
</tr>
<tr>
<td>Examination</td>
<td>150 minutes</td>
</tr>
<tr>
<td>Post examination survey</td>
<td>10 minutes</td>
</tr>
<tr>
<td>Total</td>
<td>3 hours 20 minutes</td>
</tr>
</tbody>
</table>

**Withdrawal from the Exam**

A candidate may cancel and reschedule an examination appointment either by submitting a written request to the certifying agency at least seven working days before the designated examination date. The candidate is allowed to re-appear in the next certification examination with paying 50% as an additional fee. If a candidate is late in withdrawing from the certification exam, does not appear for it, or arrive late, the candidate will be considered a no-show. All no-shows and candidates who have withdrawn not beyond the start date of the examination will have to re-apply to take the examination with full registration fee.

**Confirmation of Credential to Third Parties:**

Certifying agency shall maintain a record of all the candidates who have appeared for the certification examination in a particular year along with their grades. It shall also maintain a record of the certified power system planners. Certifying agency will confirm to the sponsoring organization that an individual holds a valid/‘active’ power system planner certificate (including releasing the certificate number and the issuance date) in response to a written request, on the employer’s letterhead (or official e-mail).

**Dispute Resolution Process:**

Any dispute arising under the Power System Planner Certification Program or from the establishment of rules, policies, or procedures dealing with any segment of the certification process, or as a result of disciplinary action shall be subject to the Power System Planner Certification Dispute Resolution Process (hereafter called the “Process”). The dispute resolution process consists of two steps.

1. Write to the examination coordinator (a designated officer of certifying agency) explaining the nature of dispute. The candidate shall attach the photocopy of the valid admit card along with the letter. It is expected that most of the disputes shall be resolved at this first step. If the issue(s) is not resolved to the satisfaction of the parties involved in the first step, the matter may be brought to the notice of higher authority of the certifying agency.

2. CEO, certifying agency may constitute a committee to examine the dispute. The candidate shall be given an opportunity to present his/her case before the committee at a specified place, date and time. The committee shall give its recommendations to the certifying agency within fifteen days of the meeting with the candidate. certifying agency shall communicate the final
decision to the concerned person within thirty days (30) of the meeting of the aggrieved person with the committee. The decision of the certifying agency shall be treated as final.

**Disciplinary Action:**

The following shall serve as grounds for disciplinary action:

1. Intentional misrepresentation of information provided on Power System Planner Certification exam registration form

2. Intentional misrepresentation of identification in the exam process. This includes, but is not limited to, a person identifying himself or herself as another person to obtain certification for the other person.

3. Violation of one or more examination centre regulations (as prescribed in this document) by a candidate.

4. Any form of cheating during a certification exam. This includes, but is not limited to, bringing unauthorized reference material in the form of notes, study material, or other methods of cheating into the examination centre.

The in-charge of the examination centre shall report incidents fit for disciplinary action to the certification examination coordinator. The examination coordinator may discuss with the candidate involved and submit the preliminary findings and communicate the decision to the concerned candidate. The candidate may have the right to appeal through the dispute resolution process.

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## Proposed Syllabus

<table>
<thead>
<tr>
<th>Section</th>
<th>Topics</th>
</tr>
</thead>
</table>
| **Power System**              | Power Generation: Conventional & non-conventional methods, Overview of Generators: Components, Construction and Basic Operating Principles  
Substation: Bus Bar Arrangement Scheme, Components & Layout, AIS & GIS Technology, Digital Substation  
Circuit Breakers: Principle & Operation, Types of CB , Short Circuit Current rating  
Transformers: Principle & Operation, Cooling Arrangement, Tap Changer, Auto Transformers  
Reactors: Function & Types of reactors, Selection of reactors for different applications  
Surge Arresters: Working principle, Selection & applications of surge arrester  
Measurement Devices: Current Transformer (CT) & Capacitor voltage Transformer (CVT) function & applications  
Power System Protection: Types and Severity of different faults, Protection zones, classification of protection scheme, Different protection relays and working principle |
| **Power System Planning & Studies** | Planning Process and Philosophy, Reactive Power Management & Voltage Regulation, Static and Dynamic compensation devices, FACTs Devices, Renewable Integration: Challenges  
Steady state studies: Modeling of power system components in PSSE, Line Parameters, Preparation of Base case (LGB), Load Flow studies, Short circuit or fault level studies, Stability Studies: Transient study & voltage stability  
Insulation Coordination, Lightning surge, Switching over voltage studies & Dynamic over voltage studies, NGR calculation |
| **Open Access**               | Fundamentals of electricity markets, Connectivity, Long Term , Medium Term & Short Term Access, Bilateral & Power Exchange transactions  
Metering & Settlement, Regional Transmission Account, Unscheduled interchange account, Reactive energy account  
Congestion in market, Ancillary Services (RRAS) |
| **System Operation & Maintenance** | Power System Operation: Day Ahead Scheduling, Load Forecasting, Preparation of daily schedules, SCADA system overview & architecture, Communication System  
Transmission Line Maintenance: Predictive & Preventive Maintenance, Condition Monitoring of transmission lines, Real time monitoring of lines & methods  
Substation Maintenance: Monthly checks & Yearly checks for condition monitoring of switchyard equipments and Testing Procedure |
| **Regulatory framework (Policies and Legal framework)** | Reforms in Indian Power Sector, Framework of Indian Power Sector, Evolution of Indian National & Transnational Grids  
Electricity Act 2003, National Electricity Policy, National Electricity Plan, CEA Planning Criteria, Technical Standards for Connectivity to the Grid, CEA (Installation and Operation of meters) Regulation, Technical Standards for construction of electric plants and electric lines, CEA safety standards for construction and O&M  
Indian Electricity Grid Code (IEGC), Planning Regulations, Grant of Connectivity Regulations, LTA and MTOA Regulations, Detailed procedure for grant of connectivity to RE generators, Open Access Regulations, Regulatory Approval  
Tariff Policy, Sharing of Inter State Transmission Charges and Losses Regulations, BCD Procedure, Point of connection mechanism for transmission tariff and transmission losses, terms and conditions of tariff determination, Cross Border Regulations, Regulation of Power Supply, Congestion charge regulations, Deviation Settlement Regulations |
| **Reasoning and Analytical Traits** | Decision making and Post Decision Analysis |

**One Day Technical Site Visit**