National Power Training Institute
Power Systems Training Institute
Bangalore – 560070

Telefax:08026713758; email:pstinpti@yahoo.com; Website: www.nptibangalore.in

No. NPTI/PSTI/PSO/2018-19/ Date: 18 April, 2018

As per Mailing List

Sub: Training and Certification of System Operators – Reg.

Sir,

As you are aware that Ministry of Power has renewed the accreditation of NPTI for conducting training and certification of LDC executives, in this connection, NPTI, PSTI, Bangalore, NPTI, Faridabad and NPTI(NER) Guwahati are pleased to announce the next set of Short Term Courses for executives of Load Despatch Centres.

The short term courses are comprised of basic level course on “Power System Operation”, specialist level courses for certified system operators on “Regulatory Framework”, “Power System Reliability”, “Power System Logistics”, “Renewable Energy Sources and Grid Integration Issues” and “Power Market Specialist”.

The schedule of short term training programs during 2018-19 is as follows:

Sl. No.	Course	Level	Duration	Period	Venue
1	Power System Operation	Basic	2 weeks	28 May – 09 June, 2018	PSTI, Bangalore
				01 – 13 October, 2018	
				19 Nov. – 01 Dec., 2018	
				04 – 16 February, 2019	NPTI, Guwahati
2	Power System Reliability	Specialist	6 days	02 - 07 July, 2018	PSTI, Bangalore
3	Power Market Specialist	Specialist	6 days	30 July – 04 August, 2018	NPTI, Faridabad
4	Power system Logistics	Specialist	6 days	10 - 15 September, 2018	NPTI, Faridabad
5	Regulatory Framework in Power Sector	Specialist	6 days	10 – 15 December, 2018	NPTI, Faridabad
6	Renewable Energy Sources and Grid Integration	Specialist	6 days	06 – 11 January, 2019	PSTI, Bangalore

The courses are preferably residential in nature. The accommodation, boarding and lodging will be provided in NPTI, Faridabad, PSTI, Bengaluru and NPTI(NER) Guwahati Executive Hostels. Training Manuals and Study Material will be provided to the participants of these training courses. These courses equip the System Operators with necessary inputs to take-up the basic level and specialist level **System Operators' Certification Examinations.**

The sponsoring authorities shall submit an undertaking in the format enclosed with each list of nominations as per the directions of CERC in response to petition No. 222/MP/2015 dated 6.11.2015.

The programme profile, schedule and day-wise programme are enclosed in the annexure. You are requested to sponsor your System Operators for these programs. It is proposed to accept nominations on First-Come-First-Serve basis for a maximum of 40 participants per batch. Hence it is requested to send nominations at least 10 days in advance along with full details of the participants and the sponsoring authority. The payment of course fee may be made in advance in favour of "PSTI, Bangalore", "NPTI, Faridabad" or "NPTI Guwahati" depending on the venue of the course.

Thanking you.

Yours faithfully,

Pamu Srinivasa
Head of the Institute

Encl**.:**
Annexure as above

Copy submitted for kind information to:

1. Shri K V S Baba, CEO, Power System Operation Corporation Ltd.
   B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110016

2. Shri S. R. Narasimhan, General Manager, NLDC, B-9, Qutub Institutional Area,
   Katwaria Sarai, New Delhi-110016

3. Dr. (Prof) R.K.Pandey, Director General, NPTI, NPTI Complex, Sector -33, Faridabad – 121003

4. Shri J.S.S. Rao, Principal Director, NPTI, NPTI Complex, Sector -33, Faridabad – 121003

5. HoI, NPTI (NER) Guwahati

Annexure - A

Basic Level Course on "Power System Operation"

A. Objective:

Operation of an interconnected power system in India is coordinated through the State, Regional and National Load Despatch Centres in collaboration with the generation and transmission control centres. Prompt action by the System Operator during minute-to-minute operation as well as a system emergency is vital for the reliability of power system. In this regard, the regulation 5.1 (h) of the Indian Electricity Grid Code mandates that the control room of the National, Regional and State Load Despatch Centre, power plants, substations of 132 kV and above, and other control centres of all regional entities shall be manned round the clock by qualified and adequately trained personnel. Further, CERC in its order dated 7th May 2008 in suo motu petition 58/2008, endorsed the need for appropriately skilled operators for secure operation of power system in India in the scenario of continuous load growth, system expansion and multiplying number of organizations.

The above subject has also been dealt with in great detail by the committee set up by the Govt. of India under the Chairmanship of Shri. G.B. Pradhan, Addl. Secretary, MoP. The committee recommended setting up of a system of certification of System Operators by an independent Central body. The National Power Training Institute has been entrusted with the responsibility of conducting the training and certification exams. In line with the requirements of training and certification of system operators PSTI, Bangalore will be organizing the basic course on "Power System Operation". The course outline, program schedule and the day wise schedule are as follows;

- **Programme Schedule and course fee:**

<table>
<tr><td rowspan="2">Batches</td><td rowspan="2">Scheduled Dates</td><td rowspan="2">Venue</td><td colspan="2">Non-residential Fee per participant including GST in Rs.</td><td colspan="2">Residential Fee per participant including GST in Rs.</td><td rowspan="2">Contact Person & Mobile no.</td></tr>
<tr><td>Sponsored by SLDC</td><td>Others</td><td>Sponsored by SLDC</td><td>Others</td></tr>
<tr><td>1</td><td>28 May – 09 June, 2018</td><td rowspan="3">PSTI, Bangalore</td><td rowspan="3">Nil</td><td rowspan="3">38,940</td><td rowspan="3">22,302</td><td rowspan="3">61,242</td><td rowspan="3">Piyali Sarkar – 9900097375;

V.Sureshbabu - 09886441203</td></tr>
<tr><td>2</td><td>01 – 13 October, 2018</td></tr>
<tr><td>3</td><td>19 Nov. – 01 Dec., 2018</td></tr>
<tr><td>4</td><td>04 – 16 February, 2019</td><td>NPTI, Guwahati</td><td>Manojkumar Jha - 09085646753</td></tr>
</table>

The non-residential course fee includes the tuition fee, course material, working lunch, technical visits, etc. The residential course fee apart from the above includes the complete boarding and lodging charges for single/double A/C room accommodation in PSTI Bengaluru/ NPTI (NER) Guwahati Executive / Graduate Hostel, Cable TV, Wi-Fi, Recreation facilities, etc. The participants are required to bring lap-top of their own to access the Internet.

C. Basic course on Power System Operation - Day-wise Program

Day	Focus Area /Particulars	Outline
Day-1 FN	Power Sector Overview	Electricity Supply chain, components of the Power System, Sources of Power: Hydro, Thermal, Nuclear, Gas, Renewable. Distribution of energy sources in the country, Institutional frame work, Regional grids in India, development of state, regional and national grids. Load Dispatch function, Load Dispatch Centers in India, Control Areas: regional and state power systems, Inter connections, characteristics, merits and demerits, inter-regional links, capacities, peculiarities of Indian Grids, Planning philosophy
Day-1 AN	Policy, Legislation	Legal Framework, policies, regulations and organizational set up; Ring fencing of system Operation
Day-2 FN	Policy, Legislation	Electricity Act 2003; Smart grid operations in India
Day-2 AN		Regulatory Framework; National Electricity Policy, Tariff Policy
Day–3 FN	Regulations	Terms and conditions of Tariff Regulations
Day–3 AN	Regulations	Indian Electricity Grid Code (IEGC)
Day–4 FN	Regulations	Grid connectivity standards, Grid Standards Regulations,
Day–4 AN	Regulations	Open Access Regulations, Metering Regulations
Day-5 FN	Load Dispatch	Characteristics of Thermal, Hydro, Gas, Nuclear, renewable power plants. Overview of Generators, components, basic operating principles, rotational speed.
Day-5 AN	Load Dispatch	Substations: Layout, Equipment, Bus arrangements. Circuit Breakers: Types, construction, operation, selection and sizing, Transformers: Physical construction cooling arrangements, Tap changers, auto transformers.
Day-6 FN	Load Dispatch	The effect of transmission line conductor resistance and inductance, line voltage drop and power angle, effect of line loading on voltage drop and power angle, effect of load power factor on voltage drop and power angle.
Day-6 AN	Load Dispatch	The need to generate and provide MVAR, sources and sinks of reactive power, charging current required due to the line shunt capacitance, production of reactive power by line shunt capacitance, Ferranti effect. Line reactive compensation equipment: Reactors, capacitors, Synchronous Condensers and Static VAR compensators.
Day-7 FN	Power System Protection	Protection of Generator, Protection of Bus-Bars and Distribution Protection.
Day-7 AN	Power System Protection	Over view of power system protection, Protection Zones, classification of protection relays, Impedance protection and fault loops, impedance relay characteristics, reactance, impedance, admittance (MHO), quadrilateral, special characteristics, faults affecting impedance relay performance, fault resistance, load encroachment, remote in feed, mutual induction, System protection schemes, Protection for abnormal frequency and voltages.
Day - 8	Technical Visit	Technical visit to Kolar - HVDC Station.
Day-9 FN	Electricity Market	Fundamentals of Electricity markets: Restructuring, Corporatization, privatization, competitive markets – pricing mechanisms, regulated markets,

	Operation	impact of transmission and system operation on electricity markets. Day–ahead resource scheduling: load forecasting, preparation of daily schedules, shortages, base load stations, peaking stations, must – run stations, generation location & effect on losses, open access: Bilateral contracts and power exchange transactions. Total Transmission Capability, Available Transmission Capacity and Ancillary Services.
Day-9 AN	Electricity Market Operation	Whole Sale market design: Bilateral contracts, organized trading, market abuse and its mitigation: Market power and its evaluation, implications of market abuse, detection and avoidance of market abuse. Congestion Charge Regulations. Power System Reliability Principles, Point of Connection (PoC) Tariff principles and Transmission loss Regulations.
Day-10 FN	Electricity Market Operation	Metering and settlement: Measurement principles, meter placement, meter data collection, validation and processing, preparation of energy accounts and billing, Regional energy account, Unscheduled Interchange account, Reactive energy account, Congestion Charge Regulations.
Day-10 AN	Electricity Market Operation	Commercial & Economic Aspects: Introduction to Power System Economics, Electricity Markets, Pool Operation Coordinated multilateral trading model, Power Exchanges Operations, capacity & energy markets, balancing mechanism. Settlement system – ABT & UI, modalities for access to transmission: Long term, Medium term, Short term. Grid Connectivity Standards, Open Access Regulations.
Day–11 FN	System Logistics (SCADA/IT)	SCADA / EMS: Overview, architecture, main components, Hardware-overview, System software – Displays, Database; Disturbance data collection modules / HDR retrieval & playback, HIM, Trends, Alarms, Health check, trouble shooting
Day–11 AN	System Logistics (SCADA/IT)	Communication systems: Overview – VSAT, Microwave, Optical Fiber etc., Hardware Protocols, Configuration, Communication network
Day–12 FN	Energy Management System	Energy Management System: Load forecasting- similar day forecast, weather based load forecast, historical data, Network study- Network modeling; special devices like HVDC, FSC, Pumped storage; network reduction & equivalence, state estimation – techniques, detection & identification of bad measurement, network observability, Optimal power flow-cost optimization, loss optimization, control optimization, voltage & VAR scheduling, unit commitment, contingency analysis.
Day–12 AN	Energy Management System	Power system reliability: Adequacy – Long term planning, procurement security, states of power system – normal, alert, emergency, restorative, planning criteria, connectivity standards, grid standards, grid code, power system equipment capacity & limits, Transmission capacity & transfer capability, ATC in planning and operating time frames, Requirement of reliability co-ordinators at organizational level
Day– 13 FN/AN	Assessment, Review, Feedback & Valedictory	

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Annexure - B

Specialist level course on "**Power System Reliability"**

A. Objective:

The basic level Certification exam has been successfully organized by NPTI for system operators across the Load Despatch Centres. Presently there are about 900 certified system operators in India. It is now proposed to organize the learning and development activity for specialist level operators in the field of "Power System Reliability".

Ensuring reliable and secure power system is the primary responsibility of every system operator. Grid incidents of July 2012 have underlined the importance of grid security. As the grid grows in size and complexity, grid security has to be enhanced because the consequences of failure of a large grid are severe.

Therefore, Capacity Building in Reliability is essential for all personnel in the Power Sector. This is recognized as the next step forward in the continued Capability Enhancement of System Operators and an area of specific specialization. Hence, a Specialist Learning and Development Programme and Certification Exam have been planned on "Power System Reliability".

This short-term Training Course is of **one week** (6 days) duration. Training Manuals and Study Material will be provided to the participants of this training course. This course equips the System Operators with necessary inputs to take-up the **Specialist Level Certification Examination** in "Power System Reliability".

B. Course Schedule:

In order to facilitate the system operators in their learning and development, one customized short-term training programs has been taken up by PSTI, Bangalore as per the following schedule:

Batch No.	**Venue**	**Duration**	**Contact person**	
			Name	**Mobile No.**
1	PSTI, Bangalore	02 - 07 July, 2018	Piyali Sarkar V. Suresh Babu	09900097375 09886441203

C. Course fee:

Batch	Payment in favour of	Non-residential fee per participant including Service Tax in Rs.		Residential fee per participant including Service Tax in Rs.	
		Sponsored by SLDC	Others	Sponsored by SLDC	Others
1	PSTI, Bangalore	Nil	28,320	11,151	39,471

Non residential course fee includes the tuition fee, course material, working lunch, etc.

Residential course fee Includes the complete boarding and lodging charges for double A/C room accommodation in PSTI Executive Hostel

D. Day wise schedule of Power System Reliability:

Day/Time	0930-1100	1130-1300	1400-1530	1600-1730
Day 1	Module 1 : Basics of Power System -1	Module 1 : Basics of Power System-2	EHV AC Transmission	HVDC Transmission
Day 2	Module 1 : Power System Planning-1	Module 1 : Power System Planning-2	Module 2 : Power System Operation - 1	Module 2 : Power System Operation -2
Day 3	Module 2 : Power System Operation -3	Module 2 : Power System Operation - 4	Module 2 : Reactive Power Management-1	Module 2 : Reactive Power Management-2
Day 4	Module 2 : Power System Restoration-1	Module 2 : Power System Restoration-2	Module 3 : Steady State Power System Analysis-1	Module 3 : Power System Study, Lab Session-1
Day 5	Module 3 : Steady State Power System Analysis-2	Module 3 : Power System Study, Lab Session-2	Module 3 : Steady State Power System Analysis-3	Module 3 : Power System Study, Lab Session-3
Day 6	Module 3 : Fault Analysis	Module 3 : Power System Stability-1	Module 3 : Power System Stability-2	Evaluation Test

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Annexure - C

Specialist Level Course on "Regulatory Framework in Power Sector"

A. Objective:

The basic level Certification exam has been successfully organized by NPTI for system operators across the Load Despatch Centres. Presently there are about 900 Basic Level certified system operators in India. It is now proposed to organize the learning and development activity for specialist level operators in the field of "Regulatory Framework".

In the last decade significant changes have taken place in the Indian Power Sector, these have evolved, catalysed by Policy and Regulatory reforms. Policies and regulations have played a pivotal role in promoting investment in the sector and have put the Indian Power Sector on the right trajectory towards promoting competition, economy and efficiency in the sector.

The Capacity Building in Regulatory Framework is essential for all personnel in Power Sector. This is recognized as the next step forward in the continued Capability Enhancement of System Operators and an area of specific specialization

This short-term Training Course is of **one week** duration. Training Manuals and Study Material will be provided to the participants of this training course. This course equips the System Operators with necessary inputs to take-up the **Specialist Level Certification Examination** in "Regulatory Framework".

B. Course schedule:

In order to facilitate the system operators in their learning and development, a customized short-term training program has been taken up by NPTI, Faridabad.

Batch No.	**Venue**	**Duration**	**Contact person**	
			Name	**Mobile No.**
1	NPTI, Faridabad	10 – 15 December, 2018	Alka Yadav	09717811667

C. Course fee:

Batch No.	**Payment in favour of**	Non-residential fee per participant including Service Tax in Rs.		Residential fee per participant including Service Tax in Rs.	
		Sponsored by SLDC	Others	Sponsored by SLDC	Others
1	NPTI, Faridabad	Nil	28320	11,151	39,471

Non residential course fee includes the tuition fee, course material, working lunch, etc.

Residential course fee Includes the complete boarding and lodging charges for double A/C room accommodation in NPTI Executive Hostel

D. Program Profile - Regulatory Framework

	Orientation		Facilitated by Module Mentor & VIP Guests
1	A1	Acts and Policies	1. Legal Framework in India- philosophy, concept and Relevance with special Focus on Power Sector 2. National Electricity Policy 3. Tariff Policy 4. National Electricity Plan
2	A2		1. Basic Micro and Macro Economic Concepts for Power Sector 2.Case I / Case 2 Bidding Process
3	A3		1. Electricity Act 2003
4	A4		1. Report of the Committee on Manpower, Certification and Incentives for System Operation and Ring fencing Load Despatch Centres, 2008 2. Report of the Task Force on Capital Expenditure and Issues related to Emoluments of Personnel in Load Despatch Centre, 2009 3. Report of the Task Force on Manpower Selection, Recruitment Procedure and Tenures for Personnel in State Load Despatch Centres , 2009 4.Report of the Combined Committee for Training and Certification of System Operators, 2010
5	A5		1. Energy Conservation Act 2001
6	B1	Grid Code, Standards and Case Studies	1. Indian Electricity Grid Code Regulations, 2010
7	B2		1. Grid Standards Regulations 2010 2. Technical Standards for Connectivity to the Grid 3. Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations 2010 4. Central Electricity Authority (Installation and Operation of meters) Regulations 2006
8	B3		1. Central Electricity Authority (Safety requirements for construction, operation and maintenance of electrical plants and electric lines) Regulations 2011 2. Central Electricity Authority (Measures relating to Safety and Electricity Supply) Regulations, 2010 3. Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2010 4. Central Electricity Authority (Procedure for Transaction of Business) Regulations 2006
9	B4		Drafting Petitions, Case Studies (Workshop, Assignments)/ Case I / Case 2 Bidding
10	B5		Drafting Petitions, Case Studies (Workshop, Assignments)/ Case I / Case 2 Bidding
11	C1	Transmission	1. Sharing of Inter State Transmission Charges and Losses Regulations, 2010 : Part 1 (Technical

			Aspects)
12	C2		1. Sharing of Inter State Transmission Charges and Losses Regulations, 2010 : Part 2 (Commercial Aspects)
13	C3		1. Connectivity, Long-term Access and Medium-term Open Access in inter-State Transmission and related matters Regulations, 2009. 2. Grant of Regulatory Approval for execution of Inter-State Transmission Scheme to Central Transmission Utility Regulations, 2010 3. Procedure, Terms and Conditions for grant of Transmission Licence and other related matters
14	C4		1. Open Access in Inter-state Transmission Regulations, 2008
15	C5		1. Unscheduled Interchange charges and related matters Regulations, 2009 2. Measures to relieve congestion in real time operation Regulations, 2009 3. Regulation of Power Supply, Regulation,2010
16	D1	Power Markets	1. Terms and Conditions of Tariff, Regulations for 2009-14 : Part 1 (Generation)
17	D2		1 Terms and Conditions of Tariff, Regulations for 2009-14 : Part 2 (Transmission)
18	D3		1. Power Market Regulations, 2010 2. Procedure, Terms and Conditions for grant of trading license and other related matters Regulations, 2009 3. Fixation of Trading Margin Regulations, 2010
19	D4		1. Power system Development Fund Regulations, 2010. 2. Fees and charges of Regional Load Despatch Centre and other related matters Regulations, 2009
20	D5		1. Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation Regulations, 2010. 2. Terms and Conditions for Tariff determination from Renewable Energy Sources, 2009

E. Day-wise Program

DAY	9:30 - 11:00 AM	11-11.30 AM	11.30 - 1 PM	1 - 2 PM	2 - 3:30 PM	3:30 - 4.00 PM	4.00 - 5:30 PM	5.30-6:00 PM	6.00 - 7:30 PM
	Slot A		Slot B		Slot C		Slot D		Slot E
MON	Session A1	Tea Break	Session A2	Lunch	Session A3	Tea Break	Session A4	Tea Break	Pre Evaluation Test
TUE	Session A5		Session B1		Session B2		Session B3		
WED	Session C1		Session C2		Session C3		Session C4		Session D4
THUR	Session C5		Session D1		Session D2		Session D3		Session D5
FRI	Session B4		Session B5		Evaluation Test				
SAT									

Annexure - D

Specialist level course on "**Power System Logistics"**

A. Objective

In view of the enlarging network and increasing complexity in the Indian National Network, the importance of Network Automation cannot be over emphasized. The specialist operator is expected to be aware of the communication systems, protocols, network applications, automation features etc. The wide area monitoring which combines the supervisory control, protection, reliability and optimization of resources is approaching rapidly in the Indian Systems. With this objective the Specialist Course on "Power System Logistics" has been introduced for certified system operators. The day wise program is as follows:

B. Day-wise Program

Day	0930-1300 Hrs		1400-1730 Hrs	
1	SCADA software and architecture		RTU and RTU Protocols	
2	Communication Fundamentals and Network Protocols & Cyber Security and Backup Control Centres		Sub-Station Automation, Wide band Technology	
3	Control Center Hardware		Interfacing Data Historian, OPC, Web service	
4	EMS Software – Network Applications		Synchro - Phasor Technology & Phasor data Integration with SCADA	
5	AGC in India		Visit to Load Despatch Centre / Substation	
6	SCADA data in Analysis of Power System Performance	Auxiliary equipments	Test	Review and Certificate award

C. Course schedule:

Batch No.	Duration	Venue	Contact person	
			Name	Mobile No.
1	10 - 15 September, 2018	NPTI, Faridabad	Alka Yadav	09717811667

D. Course fee:

Batch No.	Payment in favour of	Non-residential fee per participant including Service Tax in Rs.		Residential fee per participant including Service Tax in Rs.	
		Sponsored by SLDC	Others	Sponsored by SLDC	Others
1	NPTI, Faridabad	Nil	28320	11,151	39,471

Non residential course fee includes the tuition fee, course material, working lunch, etc. Residential course fee Includes the complete boarding and lodging charges for double A/C room accommodation in NPTI Executive Hostel

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Annexure - E

Specialist level course on "Renewable Energy Sources and Grid Integration"

A. Objective

The Renewable Energy Sources have come a long way in technology, size and complexity. They are also de-facto solution for environmental degradation. They account for about 13% of installed capacity and are expected to raise beyond 50% in near future.

The Wind Electric Generation & Solar Photo Voltaic system technologies have matured. The integration of RES to the Grid is throwing many challenges to the system operator in optimizing energy sources, scheduling, dispatch. The distributed and concentrated energy storage options add another dimension to the dispatch. In view of the above a Specialist Level course has been introduced with the following day-wise program:

B. Day-wise Program

<table>
<tr><th>Day</th><th colspan="2">0930-1300 Hrs.</th><th colspan="2">1400-1730</th></tr>
<tr><td>1</td><td colspan="2">India and World RE Power scenario, Energy Efficiency and Climate Change obligations</td><td>Overview of small Hydro Technologies</td><td>Overview of Bio-mass and Bagasse technologies</td></tr>
<tr><td>2</td><td colspan="2">Overview of Solar Energy Technologies, latest trends, built-in protections and features to support grid connectivity</td><td colspan="2">Overview of Wind Energy Technologies, latest trends, built-in protections and features to support grid connectivity.</td></tr>
<tr><td>3</td><td colspan="2">RE grid integration - Issues, Challenges, (Intermittency, Variability and Unpredictability), Causes and Impact</td><td colspan="2">Forecasting, Scheduling and Deviation Settlement mechanism of Wind and Solar RE at Inter-state and Intra-state level.</td></tr>
<tr><td>4</td><td colspan="4">Technical visits to Grid connected Wind Power Plant & Solar Power Plant</td></tr>
<tr><td>5</td><td colspan="2">Steady State & Dynamic modeling of WTG & Grid Connected Solar</td><td colspan="2">Power Quality Issues, FACTS applications, Rectifier, Inverter and Power Conditioning Systems in RE integration</td></tr>
<tr><td>6</td><td>CEA Standards on RE, RE Tariff Regulations and Grid Connectivity</td><td>Grid Connected Solar Roof Top SPV Generation – Challenges, issues in its implementation</td><td>Energy Storage options and experiences from the other countries</td><td>Feedback and Valedictory</td></tr>
</table>

C. Course schedule:

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Batch No.	Duration	Payment in favour of	Contact person	
			Name	Mobile No.
2	06 – 11 January, 2019	PSTI, Bangalore	Piyali Sarkar V. Suresh Babu	09900097375 09886441203

D. Course fee:

Batch No.	Payment in favour of	Non-residential fee per participant including Service Tax in Rs.		Residential fee per participant including Service Tax in Rs.	
		Sponsored by SLDC	Others	Sponsored by SLDC	Others
1	PSTI, Bangalore	Nil	28320	11,151	39,471

Non residential course fee includes the tuition fee, course material, working lunch, etc.

Residential course fee Includes the complete boarding and lodging charges for double A/C room accommodation in PSTI Executive Hostel.

Annexure - F

Specialist level course on "Power Market Specialist"

- **Objective**

The Indian Power system network is growing in size and complexity at a high speed. Opening of Generation, Transmission, Distribution and the power trading to private sector resulted in increase in the no of market participants. The introduction of open access in the transmission system and gradually in the distribution systems is creating opportunity as well as challenges for system operator to optimally utilize the resources and despatch the system efficiently.

Added to these things the proportion of renewable sources in the system is increasing by the day thereby making the system operation more complex. In this back drop the system operator has to specialize in market operations with due regard to the reliable and optimal operation of the system. A specialist level course of "Power Market Specialist" is being introduced to achieve this objective of efficient market operations with due regard to the regulations and optimal operations.

- **Day-wise Program**

Day	0930-1300 Hrs.	1400-1730	
1	Introduction to Restructuring of Power Industry	Fundamentals of Economics	
2	Market Power and Financial Products	Philosophy of Market Models	
3	Auctions	Pricing of Transmission Network Usage and Loss Allocation	
4	Locational Marginal Prices (LMP) and Financial Transmission Rights (FTR)	Transmission Congestion Management	
5	Ancillary Service Management	Financial Settlement	
6	Ideation and Innovation in Indian Electricity Market	Evaluation Test	Feedback and Valedictory

C. Course schedule:

Batch No.	Duration	Payment in favour of	Contact person	
			Name	Mobile No.
1	30 July – 04 August, 2018	NPTI, Faridabad	Alka Yadav	09717811667

D. Course fee:

Batch No.	Payment in favour of	Non-residential fee per participant including Service Tax in Rs.		Residential fee per participant including Service Tax in Rs.	
		Sponsored by SLDC	Others	Sponsored by SLDC	Others
1	NPTI, Faridabad	Nil	28320	11,151	39,471

Non residential course fee includes the tuition fee, course material, working lunch, etc.

Residential course fee Includes the complete boarding and lodging charges for double A/C room accommodation in NPTI Executive Hostel.

(To be submitted along with the nomination letter duly typed on official stationary)

UNDERTAKING

I, _____ *(Name),* _____ (Designation) on behalf of _____ (name of SLDC/ STU) undertake that Mr/ Ms./ Mrs _____ (name of System Operator) whose Basic Level/Specialist Level (tick one) training is funded through LDC Development Fund shall continue to serve with LDC / STU and shall not be transferred for a period of at least 18 months from the date of completion of the training i.e. w.e.f. _____.

This undertaking is issued in line with the CERC's directions in response to Petition No. 222/MP/2015 dated 6.11.2015.

_____

(Signature of the SLDC/ STU In charge)

Place:

Date: Seal