

TAMIL NADU ELECTRICITY REGULATORY COMMISSION
(Constituted under section 82 (1) of the Electricity Act, 2003)
(Central Act 36 of 2003)

PRESENT:

Thiru M.Chandrasekar

.... Chairman

and

Thiru K.Venkatasamy

... Member (Legal)

M.P. No.17 of 2019

State Load Despatch Centre (SLDC)
Tamil Nadu Transmission Corporation Limited
144, Anna Salai
Chennai – 600 002.

... Petitioner
(Thiru V.Anil Kumar,
Standing Counsel for SLDC)

Dates of hearing :20-12-2019; 28-01-2020; 11-02-2020;
10-03-2020; 02-06-2020; 14-07-2020
and 23.02.2021

Date of Order : 15-06-2021

The Tamil Nadu State Load Despatch Centre (hereinafter referred as “TNSLDC” or “the Petitioner”) filed the Capital Investment Plan (hereinafter referred as “CIP”) for the MYT Control Period from FY 2019-20 to FY 2021-22 in M.P. No. 17 of 2019. The M.P.No.17 of 2019 came up for final hearing on 23-02-2021. The Commission upon perusal of the above petition and other connected records and after hearing the submissions of the Petitioner hereby makes the following:

ORDER

1.The prayer of the Petitioner is to approve the Capital Investment Plan for SLDC Business for FY 2019-20 to FY 2021-22 as proposed in the aforesaid Petition.

2. Facts of the Case:-

2.1 The petition filed is for approval of Capital Investment Plan for the control period of FY 2019-20, FY 2020-21 & FY 2021-22.

2.2 Regulation 17 of the TNERC (Terms and Conditions for Determination of Tariff) Regulations, 2005 specifies that the licensee shall get the Capital Investment Plan approved by the Commission before filing ARR and application for determination of Tariff.

2.3.The Commission vide its letter dated 03rd October, 2019 directed the petitioner to file Capital Investment Plan for the control period of 2019-20 to 2021-22 by 30th November, 2019. In reply to the letter by the Commission, Petitioner filed an affidavit seeking extension upto 31st December, 2019 for filing the Capital Investment Plan. The said extension was requested as the segregation of assets and liabilities between TANTRANSCO and the petitioner was in progress.

2.4 In compliance with the Commission's Tariff regulations, TNSLDC, filed its Capital Investment Plan through this M.P No.17 of 2019 seeking approval for capital expenditure of Rs.141.56 Crores, Rs.213.00 Crores and Rs. 185.05 Crores for the control period of FY 2019-20 to FY 2021-22 respectively on 10.12.2019. The petition came up for admission on 17.12.2019 and during the hearing, the petitioner was directed to upload the petition in the website to obtain stakeholders' comments and file additional details with reply to

stakeholders comments, funding, capitalization, justification for each work.

2.5 As directed by the Commission vide the daily order dated 17.12.2019, the Capital Investment Plan of SLDC for the control period 2019-20 to 2021-22 was hosted on 20.12.2019 in the SLDC's official web site for obtaining comments/suggestions from the stakeholders. The stakeholders were given 15 days time from 20.12.2019 to 04.01.2020 for offering their comments/suggestions. No comments/suggestions were received from the stakeholders in respect of the above Capital Investment Plan upto the due date 04.01.2020. Further, as directed by the Commission vide its daily order, dated 10.03.2020, the Secretary to Government, Energy Department, GoTN was addressed to implead the Secretary to Government, Finance Department, GoTN for offering remarks on the Capital Investment Plan. Remarks have not been furnished.

2.6 The Commission vide daily order dated, 02.06.2020 in M.P.No.17 of 2019 directed as follows:

"The petitioner is directed to file a fresh affidavit incorporating the actual expenditure incurred for the financial year 2019-20 and modify the financial requirements for FY 2020-21 after deducting the proportionate expenditure taking into account the lockdown period due to COVID-19. The case is adjourned to 06-07-2020."

2.7 The petitioner filed a fresh affidavit taking into account the lockdown due to COVID-19 revising the Capital expenditure for the control period of FY 2019-20, FY 2020-21 & FY 2021-22 with capital expenditure of Rs.3.31 crores, Rs.159.62 crores and Rs.310.55 crores. Schedules of capitalization

shown were not commensurate with the works involved. Further details of funding, appropriate technical justifications were not provided. Phasing of investments did not account for the slow progress of works during the pandemic. The case was reopened on 23.2.2021 and Commission directed the petitioner to file updated status, actual expenditure incurred as on date and revised schedules of capital expenditure and capitalization.

3.0 Submissions of the Petitioner:

3.1 General

i) The Petitioner, TNSLDC, is a statutory body set up under Section 31 of the Electricity Act, 2003 and performs the functions specified under Section 32 of the Electricity Act, 2003. The working/functions of the petitioner are governed by the Electricity Act 2003, Regulations of CERC/SERC/any other government body as amended from time to time.

ii) Tamil Nadu Electricity Board (TNEB) came into existence on 1st July 1957 under the repealed Electricity (Supply) Act, 1948 and was engaged in the management of electricity Generation, Transmission, Distribution and related activities in the State of Tamil Nadu.

iii) The Electricity Act 2003, Sections 131 to 134 mandates reorganization of the State Electricity Boards into functional entities and corporatization of the same.

iv) In accordance with the above mandatory provision, the Tamil Nadu Electricity Board (TNEB) has been unbundled into three companies vide G.O.Ms.No.114 Energy (B2) Department dated 8th October, 2008 with the stipulation that the afore mentioned companies shall be fully owned by the

State Government as below:

- (i) TNEB Ltd - Holding Company
- (ii) Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) - a Subsidiary Company handling Generation and Distribution functions,
- (iii) Tamil Nadu Transmission Corporation Limited (TANTRANSCO)- a Subsidiary Company handling Transmission functions.

v) According to the aforesaid Notification, the TANTRANSCO undertakes the function of transmission of electricity in the State of Tamil Nadu. The State Transmission Utility, TANTRANSCO has been vested with the State Load Despatch functions till further Orders of the State Government from the date of transfer.

vi) In Tamil Nadu, the Grid operation was started during November 1964. The first Load Despatch Centre of this State was started at Erode on 06.11.1964 with a load of 110 MW. Subsequently, the Main Load Despatch Centre of Tamil Nadu was started at Chennai on 1st June 1986 with the load of 3000MW. Sub Load Despatch Centre at Madurai was started on 15th September, 1986. Based on the Generation and Demand Growth of Tamil Nadu, Sub-Load Despatch Centre (Sub LDC) was started at Chennai on 1st December, 1996 with the load of 5000 MW. Presently, the State Load Despatch Centre (SLDC) is functioning at Chennai with three Sub Load Despatch Centres at Chennai, Erode and Madurai.

vii) Section 31 of the Electricity Act, 2003, provides for constitution of State Load Despatch Centre (SLDC):

"31. (1) The State Government shall establish a Centre to be known as the State Load Despatch Centre for the purposes of exercising the powers and discharging the functions under this Part.

(2) The State Load Despatch Centre shall be operated by a Government company or any authority or corporation established or constituted by or under any State Act, as may be notified by the State Government.

Provided that until a Government company or any authority or corporation is notified by the State Government, the State Transmission Utility shall operate the State Load Despatch Centre:

Provided further that no State Load Despatch Centre shall engage in the business of trading in electricity."

viii)Section 32 of the Electricity Act, 2003 defines the functions of State LoadDespatch Centre.It states that:

"(1) The State Load Despatch Centre shall be the apex body to ensureintegrated operation of the power system in a State.

(2) The State Load Despatch Centre shall-

(a) be responsible for optimum scheduling and dispatch ofElectricity within a State, in accordance with thecontracts entered into with the licensees or the Generating companies operating in that State;

(b) monitor grid operations;

(c) keep accounts of the quantity of electricity transmitted through the State grid;

(d) exercise supervision and control over the intra -State transmission system; and

(e) be responsible for carrying out real time operations for grid control and dispatch of electricity within the State through secure and economic operation of the State grid in accordance with the Grid standards and the State Grid Code."

(3) The State Load Despatch Centre may levy and collect such fee and charges from the generating companies and licensees engaged in intra-State transmission of electricity as may be specified by the State Commission '

ix) Further, the Electricity Act, 2003, under section 33 states the following:

“33.Compliance of directions:(1) The State Load Despatchcentre in a State may give suchdirections and exercise such supervision and control as may be required for ensuring theintegrated grid operations and for achieving the maximum economy and efficiency in the operation of power system in that State.

(2) Every licensee, generating company, generating station, substation and any other person connected with the operation of the power system shall comply with the direction issued by the State Load Despatch Centre under subsection (1).

(3) The State Load Despatch Centre shall comply with the directions of the Regional Load Despatch Centre.

(4) If any dispute arises with reference to the quality of electricity or safe, secure and integrated operation of the State grid or in relation to any direction given under sub-section (1), it shall be referred to the State Commission for decision: Provided that pending the decision of the State Commission, the direction of the State Load Despatch Centre shall be complied with by the licensee or generating company.

(5) If any licensee, generating company or any other person fails to comply with thedirections issued under subsection(1), he shall be liable to penalty not exceeding rupees five lacs.

x)TNSLDC is to ensure integrated operation of power system in the State in a reliable and economic manner in accordance to sections 31,32,33 of the Electricity Act 2003 and is committed towards carrying out real time operations for grid control and despatch of electricity within the region through secure and economic operation of the regional grid in accordance with the Grid Standards and the Grid Codes in force.

xi) The maximum demand handled by TNSLDC during the FY 2019-20 is given in the table below:

Table 1: Maximum Demand

<i>Month</i>	<i>Peak demand (MW)</i>
<i>Apr-19</i>	<i>16151</i>
<i>May-19</i>	<i>15822</i>
<i>Jun-19</i>	<i>15861</i>
<i>Jul-19</i>	<i>15727</i>
<i>Aug-19</i>	<i>14681</i>
<i>Sep-19</i>	<i>15194</i>
<i>Oct-19</i>	<i>14730</i>
<i>Nov-19</i>	<i>14229</i>
<i>Dec-19</i>	<i>13975</i>
<i>Jan-20</i>	<i>14855</i>
<i>Feb-20</i>	<i>15094</i>
<i>Mar-20</i>	<i>15664</i>

xii) Considering the duties and functions of the State Load Despatch Centre illustrated in the Electricity Act, 2003, the business scope of TNSLDC aims to enhance infrastructure so that monitoring grid parameters in real time and maintaining power supply to the consumers of the Distribution Licensee, scheduling, metering, accounting and settlement of transaction in electricity can take place efficiently.

xiii) The Capital Investment Plan (CIP) comprises of infrastructure required by TNSLDC to perform robust, scalable and dispute free scheduling, metering, accounting and settlement of transactions in electricity. The Capital Investment Plan has been prepared considering the growing penetration of renewable energy sources and increasing transaction of electricity at intra-state and inter-

state level.

xiv) The CIP has been envisaged (i) to ensure Integrated Operation of power system in the state and to facilitate transfer of electric power within and across the regions with Reliability, Security and Economy; ii) to analyze and anticipate the major requirements of infrastructure to operate the power market in an integrated manner.

xv) Responsibility of SLDC has increased manifold with integration of grids at state and Regional level. Significant increase in infirm nature of Renewable energy sources, intra State and inter State open access transactions have expanded volume of transactions handled by SLDC.

xvi)As per TNERC MYT Regulations, 2009 that requires submission of CIP for multi year, the CIP highlighting the works that are proposed to be completed for the control period FY 2019-20 to 2021-22 is submitted.

3.2The summary of the Capital Expenditure and Capitalisation of Schemes for the Control Period from FY 2019-20 to FY 2021-22 as submitted by the Petitioner on 06.7.2020 is as follows:

Table 2 : Capital Expenditure and Capitalisation proposed by TNSLDC (Rs.in Crores)

Sl. No	Schemes	Cost of scheme	Capital expenditure			Capitalisation		
			2019-20	2020-21	2021-22	2019-20	2020-21	2021-22
1.	ULDC SCADA upgradation	19.07	0.36	0.00	0.00	0.36	0.00	0.00
2.	Establishment of IT infrastructure for implementation of intra State ABT under	13.00	2.95	3.50	6.55	2.95	3.50	6.55

	SAMAST in Tamil Nadu and for DR Centre at Madurai Sub LDC							
3.	Modernisation of SLDC							
a.	Interior and furniture for New SLDC control room proposed at new TANTRANSCO building	3.00	0.00	0.01	2.99	0.00	0.01	2.99
b.	SLDC equipments including SCADA system, video wall for new SLDC control room proposed at new TANTRANSCO building including IT hardware and software license.	7.00	0.00	0.00	7.00	0.00	0.00	7.00
c.	Video conference system for new SLDC control room proposed at new TANTRANSCO building	0.5	0.00	0.00	0.00	0.00	0.00	0.50
4.	New building for the proposed DR centre & Back up REMC at Madurai Sub LDC	2.00	0.00	0.00	2.00	0.00	0.00	2.00
5.	Modernization for Sub LDCs & REMCs located at Chennai, Madurai and Erode including ULDC SCADA system for SLDC and Sub LDCs	7.62	0.001	1.82	5.79	0.001	0.71	5.90
6.	Performance security upgradation of ULDC EMS/SCADA system	6.00	0.00	0.00	6.00	0.00	0.00	6.00
7.	Reliable communication							
a.	Reliable communication (Development of fiber network upto 110 KV level) supply, erection, testing & commissioning of OPGW	381	0.00	100	230	0.00	100	230
b.	Reliable communication (Development of fiber network upto 110 KV level) End equipment (Fiber Optic Terminal)	100	0.00	40.00	40.00	0.00	20.00	60.00

	Equipments, TRU and allied accessories)							
8.	Transmission and Distribution Programme: Supply, erection, testing & commissioning of Fiber optic terminal equipment in existing 230 KV sub stations	18	0.00	8.29	9.72	0.00	8.29	9.72
9.	Artificial Intelligence based Active Grid network Management	6.00	0.00	6.00	0.00	0.00	6.00	0.00
	Total	563.19	3.31	159.62	310.55	3.31	139.51	330.66

3.3 The revised capital expenditure and capitalization furnished on 16.03.2021 as per the directions of the Commission on 23.2.2021 is as follows:

Table 3: Revised Capital Expenditure and Capitalisation proposed by TNSLDC (Rs.in Crores)

Sl. No	Schemes	Cost of scheme	Capital expenditure			Capitalisation		
			2019-20	2020-21	2021-22	2019-20	2020-21	2021-22
1.	ULDC SCADA upgradation	19.07	0.36	0.00	0.00	0.36	0.00	0.00
2.	Establishment of IT infrastructure for implementation of intra State ABT under SAMAST in Tamil Nadu and for DR Centre at Madurai Sub LDC	13.31	2.949	4.77	5.59	2.949	4.77	5.59
3.	Modernisation of SLDC							
a.	Interior and furniture for New SLDC control room proposed at new TANTRANSCO building	3.00	0.00	0.00	3.00	0.00	0.00	3.00
b.	SLDC equipments including SCADA system, video wall for new SLDC control room proposed at new TANTRANSCO building including IT hardware	7.00	0.00	0.00	7.00	0.00	0.00	7.00

	and software license.							
c.	Video conference system for new SLDC control room proposed at new TANTARNSCO building	0.5	0.00	0.00	0.50	0.00	0.00	0.50
4.	New building for the proposed DR centre& Back up REMC at Madurai Sub LDC	0.06	0.00	0.00	0.06	0.00	0.00	0.06
5.	Modernization for Sub LDCs & REMCs located at Chennai, Madurai and Erode including ULDC SCADA system for SLDC and Sub LDCs	7.292	0.001	0.00	5.64	0.001	0.00	5.64
6.	Performance security upgradation of ULDC EMS/SCADA system	6.00	0.00	0.00	6.00	0.00	0.00	6.00
7.	Reliable communication							
a.	Reliable communication(Development of fiber network upto 110 KV level) supply, erection, testing & commissioning of OPGW	380.68	0.00	36.73	200	0.00	36.73	200.00
b.	Reliable communication (Development of fiber network upto 110 KV level) End equipment(Fiber Optic Terminal Equipments, TRU and allied accessories)	98.25	0.00	0.00	60.00	0.00	00.00	60.00
8.	Transmission and Distribution Programme: Supply, erection, testing & commissioning of Fiber optic terminal equipment in existing 230 KV sub stations	15.83	0.00	0.00	15.83	0.00	0.00	15.83
9.	Artificial Intelligence based Active Grid network Management	6.00	0.00	0.00	6.00	0.00	0.00	6.00
	Total	556.99	3.31	41.50	309.62	3.31	4.50	309.62

3.4 Justification provided for each scheme :

3.4.1 ULDC SCADA upgradation

3.4.1.1 Communication equipment, both hardware (RTUs, DCUs) and software was procured for upgradation of old SCADA for effective monitoring of real time grid operation at cost of Rs.19.07 crores (P.O No.888 Dt.19.7.2013) which is inclusive of maintenance and work completed in September 2016. Capital expenditure of Rs.11.26 crores was already incurred. After incurring expenditure of Rs.11.26 crores, balance capital expense of Rs.0.36 crores was paid in FY19-20. This is exclusive of annual maintenance cost.

3.4.2 Infrastructure for implementation of intra State ABT under SAMAST in Tamil Nadu and for Disaster Recovery (DR) Centre at Madurai Sub LDC:

3.4.2.1 SAMAST (Scheduling, Metering and Settlement of Transactions in Electricity) is a scheme to evolve a uniform procedure for implementation of intrastate ABT across all States. Total estimated project cost is Rs.13.31 crores. A grant of Rs.11.98 crores (90% of cost) from PSDF has been sanctioned from Ministry of Power, Government of India, towards establishment of IT infrastructure. Procurement of server, network accessories, software for AMR for wind, co-gen and solar sources were made. The work has reached its final stage. Rs.2.95 crores has been capitalized in FY2019-20. Balance PSDF fund is for procurement of IT infrastructure for establishment of Disaster Recovery (DR) centre at SLDC/Madurai as recommended by SRPC, Bangalore to avoid interruptions in scheduling and other processes. Capital expenditure for 2020-21 is Rs.4.77 crores and the balance of Rs.5.59 crores would take place in FY22.

3.4.3 Modernisation of SLDC:

3.4.3.1 Proposal is to procure furniture and do interior work for new SLDC control room, procure SCADA system video wall, IT hardware, software, software license and establish video conference system at a cost of Rs.10.5 crores. Proposed capitalization is during FY 2021-22.

3.4.4 Renovation & Modernisation of old FEP/MUX room, Battery room for establishment of Disaster Recovery Centre and office for Renewable Energy Management Centre at Madurai LDC:

3.4.4.1 The Southern Regional Power Committee has approved to establish Disaster Recovery Centre as recommended in the Manual for Recovery of the Electrical Infrastructure during Natural Disaster. A Disaster recovery (DR) center is essential to be formed at SLDC/Madurai, since the SLDC Madurai operationalizes as back up of SLDC/Chennai.

3.4.4.2 The REMC project is being implemented by Power Grid Corporation of India Ltd. (PGCIL) and shall be handed over to respective SLDC/RLDC/NLDC upon completion. Entire funds for implementation of REMC project shall be provided by Ministry of Power, Govt. of India. The REMC was established at SLDC/Chennai. A separate RE forecasting centre is essential to be formed at Madurai, since most of the wind and solar power plants are located in Southern part of Tamil Nadu. In order to effectively implement in-house RE forecasting, RE DSM and smooth functioning of REMC, a backup REMC at Madurai is proposed. Hence, a New Building is essentially required for Disaster Recovery Centre for data security and speedy restoration of SLDC operations during disaster at Sub LDC/Madurai and for proposed Backup REMC at Sub

LDC/Madurai. The capital expenditure has been revised from Rs.2.0crores to Rs. 0.06 crores.

3.4.5 Modernisation of Sub LDCs, REMCs & SCADA system located at Chennai, Madurai and Erode

3.4.5.1The computers in the Sub Load Despatch Centres made up of Pentium processors are obsolete and need upgradation. Hence, to suit the latest requirements of SLDC, replacement of the old computers and peripherals is the need of the hour. Also, a local server is essentially needed for the integration of all the computers and sharing of database at Sub LDCs.

3.4.5.2The building that houses the Sub State LDC (SSLDC)/Erode was constructed in 1964. Renovation & Modernisation of the SSLDC/Erode is proposed. Further, in order to provide uninterrupted voice data communication to SLDC for effective Grid operation, a new server room to house the ULDC server, the existing SCADA UPS & Battery with interior and cooling system that will increase the life span of the battery is essential.

Further, the capital expenditure is for the following purposes:

- To establish a rooftop solar at Sub LDCs at Erode and Madurai each of 15 KW capacity in 1500 sqft area.
- Provide air conditioner with fresh air entry provision for Sub LDC/ Chennai & REMC/Chennai and provision of air purifier for all the Sub LDC control rooms.
- Renovate the old FEP/MUX room, old battery room, defective

airconditioners, at SSLDC/Madurai.

- Purchase of new servers, computers, Laptops, printers, televisions with DTH, furniture, AMR reading display, Tools & Plants items including scientific instruments for SCADA Communication, PSS-E Load Flow Studies Software with Laptop, etc. for Sub LDCs, REMCs & SCADA System at Chennai, Madurai and Erode.
- Upgradation of the IT infrastructures and other capital works as submitted above are essential for the smooth functioning of LDC. The scheme costs Rs.7.292 crores. The proposed capital expenditure is Rs. 0.001 crores in FY20 and Rs.5.64 crores in FY22.

3.4.6 Performance security upgradation of ULDC EMS/SCADA system

- Existing E-terra EMS/SCADA system is capable of getting data from more than 550 stations and in near future, about 500 stations are to be integrated. Hence, the existing data servers, both Hardware and Software, are to be upgraded to cater to additional stations. Cost of the scheme is Rs.6crores. Salient Features of the scheme are :
- New SCADA Data Server including upgrade to Linux Platform.
- Additional pair of CFE for IEC104 RTU
- Latest version of SCADA (License Upgrade)
- Additional RD Server to accommodate large No. of RVDUs.
- New additional Grid IQ
- Additional Hardware for accommodating New IEC-104 RTUs.
- Up gradation of remote consoles OS to Window'10

- Provision of additional 4 Nos. of ULDC SCADA remote consoles and provision of 32 inch widescreen display monitors for Operators at Sub LDC Madurai & Erode including REMC/ Madurai including other accessories (LAN cable & etc.)
- ULDC SCADA Dispatcher Training Simulator work station, server. The proposed capital expenditure is Rs.6 crores in FY22.

3.4.7 Reliable Communication Project:

3.4.7.1 Based on National Digital Communication Policy 2018, Government of India(GOI) has directed all the Central and State Transmission Corporations to establish OPGW based F.O. Communication and Data Acquisition facilities for all 110 KV and above level sub-stations for monitoring, management and restoration of Electricity grids.

3.4.7.2 Need of wideband (fibre optics based) communication system is summarized below:

- Expansion of Power sector is taking place at rapid pace leading to establishment of IPPs, UMPPs, High capacity transmission systems and strengthening of sub transmission systems by the states etc. This effectively means that the substations and power plants requiring data & voice connectivity with the SLDCs/RLDC is increasing in manifold.
- Natural calamities cause extensive damage to Telecommunication infrastructure. Reliable communication established through wideband systems has better protection features and is more robust in operations Wideband communication in the power network with all substations of 110 KV level and above will help to coordinate preventive measure operation, on receipt of warning of natural disaster

and also during restoration operations.

- The existing PLCC system comes with certain technical challenges which the system operators face at time of operation. The need for upgradation of PLCC system to SCADA system has been envisaged by SLDC during the control period of FY 2019-20 to FY 2021-22 to make its communication system more efficient.
- The LILO of transmission lines increases the number of hops in PLCC system and this causes deterioration of the performance of PLCC system. Due to the manifold increase in number of lines, PLCC provision is becoming very difficult due to frequency congestion. The proposed SCADA system is more efficient in handling the frequency congestion.
- With the implementation of Automatic Defence Mechanism, Special protection schemes and phasor measurement units, the bandwidth requirement has gone up manifold and this mandates for the reliable communication system. The number of lines coming under the coverage of Differential Line Protection is also increasing due to the LILO of existing lines. Therefore, SLDC intends to adopt SCADA, in which fibre optics communication system provides more flexible operations as compared to PLCC systems.

3.4.7.3 Accordingly, provision of OPGW based Fibre Optic communication with Data Acquisition System is envisaged to all sub stations of 110 KV and above level.

3.4.7.4. The following materials have been sanctioned under this project for implementing Reliable communication and data acquisition facilities to all 110

KV and above level sub stations.

Material description under Reliable communication scheme

SI. No.	Description	Qty.
1	Supply,erection,testing & commissioning of 48 Fibre optical Power Ground Wire(OPGW) with accessories	10770 KM
2	Supply, erection,testing and commissioning of: (i) fibre Optic terminal equipment with SDH technology for 100 KV sub stations (ii) Fibre Optic terminal equipment with SDH technology with multiplexer for 230 KV sub stations iii) Remote terminal unit for 110 KV SS (iv) 4 port VOIP gateway for remote (RTU)locations	620 nos. 38 nos. 620 nos. 620 nos.
3	Supply of 48V/120 AH battery & Battery charger for all 110 KV SS	620 nos.
4	Supply of 48V/120 AH battery &48V/80A Battery charger for NMS at control centre	3 sets
5	Network management systems (NMS) equipments at Chennai,Madurai& Erode	1 set.
6	Electronic Private Automatic Branch exchange(EPABX) for Chennai, Madurai & Erode	3 sets
7	Scientific instruments	12 nos.

3.4.7.5Ministry of Power vide order dt.15.11.2017 sanctioned Rs.155.48 Crores(Rs.105.93crores for OPGW &Rs.49.55crores for end equipment) as grant from PSDF for implementation of reliable communication scheme.

3.4.7.6For the past 10 years after the introduction of Fibre Optic

Communication in TANTRANSCO, all Fibre optic equipments were procured with Synchronous Digital Hierarchy(SDH) technology. Approval has been obtained from the Commission in M.P No.11 of 2021 to adopt Multi protocol label Switching transport Profile(MPLS-TP) technology.

3.4.7.7The LOA No 999 dated 29.11.2019 was awarded on M/s. Sterlite Industries limited for the supply, erection, testing and commissioning of OPGW to a distance of 10770 Kms under Reliable communication scheme at a total cost of Rs.380.68crore. The total expenditure for end terminal equipments and SCADA control centre equipments in Reliable communication scheme works out to Rs.98.25crores that includes cost of RTUs, batteries, chargers and other accessories.

3.4.7.8The total expenditure for the Reliable communication scheme program works out to about Rs..480crores (Rs.98.25crores for end terminal equipments and Rs.381.83crore for OPGW). This expenditure will be met by the grant from Ministry of Power and the balance amount will be arranged by SLDC through a mix of debt and equity.

3.4.7.9The functioning of communication and SCADA network of the Protection and Communication (P&C) Wing for the real-time operation of SLDC and Sub-LDCs is vital and hence, the entire equipment cost of SCADA and communication system is considered into SLDC account

3.4.7.10The Capital expenditure of Rs.36.73 crore towards Reliable communication scheme would take place during the financial year 2020-21. Rs. 260.00 Cr and Rs. 182.20 Cr would take place during the financial year FY 2021-22 and FY 2022-23.

3.4.8 Transmission and Distribution Program

3.4.8.1 The Transmission and Distribution program involves supply, erection, testing and commissioning of fiber optic terminal equipment in all 230 kV substations for efficient communication between SLDC and substations.

3.4.8.2 A tender was floated on 11th November, 2019 for procurement of related fiber optic terminal equipment having value of Rs.15.83 Cr. and LOA has been issued.

3.4.9 Artificial Intelligence based Active Grid Network Management (ANM) Project

3.4.9.1 Artificial Intelligence based Active Grid Network Management (ANM) is a concept that helps in easing network constraints by actively managing network devices autonomously in real time. RE is curtailed and released more quickly when a deviation in boundary limits is detected. SLDC experiences operational and commercial challenges in balancing the grid (Demand/ supply) in day to day grid operation due to the infirm RE.

3.4.9.2 The State Planning Commission has recommended the project at an outlay of Rs.6.00 Cr. under the “Tamil Nadu Innovation Initiatives (TANII) scheme” for implementing a pilot project on Artificial Intelligence based Active Network Management to minimize RE Curtailment and Improve System Balancing. The Government has accorded financial sanction for a sum of Rs.6.00 Cr. towards implementing the Artificial Intelligence based Active Grid Network Management project to minimize RE curtailment and Improve system Balancing vide Government of Tamil Nadu G.O. (No.39) dated 29th

May, 2019. The corresponding grant Rs.6.00 Crores received from Government of Tamil Nadu has been deposited in the SLDC account.

4.0 Legal Provisions:

4.1 Relevant provisions of the Tariff Policy, Commission's MYT Regulations, Tariff Regulations applicable for approval of Capital Investment Plan are extracted below:

4.2 The relevant provisions of the Tariff Policy notified by Government of India on January 6, 2016 with respect to the CIP are reproduced below:

“ 5.3 Tariff policy lays down

a) Return on Investment While allowing the total capital cost of the project, the Appropriate Commission would ensure that these are reasonable and to achieve this objective, requisite benchmarks on capital costs should be evolved by the Regulatory Commissions.

b) to (f)

g) Renovation and Modernization A multi-year tariff (MYT) framework may be prescribed which should also cover capital investments necessary for renovation and modernization and an incentive framework to share the benefits of efficiency improvement between the utilities and the beneficiaries with reference to revised and specific performance norms to be fixed by the Appropriate Commission. Appropriate capital costs required for pre-determined efficiency gains and/or for sustenance of high level performance would need to be assessed by the Appropriate Commission.” (emphasis added)

4.3 Regulation 17 of the Terms and Conditions for determination of Tariff Regulations, 2005 (Tariff Regulations) specifies as under:

“17. Capital Investment Plan

(1) The licensee shall file a detailed Capital Investment Plan every year showing separately, ongoing projects that will spill into the year under review and new project (along with justification) that will commence but may be completed within or beyond the tariff period.

(2) The Commission may consider the licensee’s investment plan for approval and for this purpose, may require the licensees to provide relevant technical and commercial details. The costs corresponding to the approved investment plan of a licensee for a given year shall normally be considered for its revenue requirement.

(3) In presenting the justification for new projects, the licensee shall detail the specific nature of the works and the results to be achieved. The details must be shown in physical parameter (e.g.) new capacity to be added, length of lines to be energised, number of sub-stations / Bays to be added, meters to be added, replaced, etc. so that it is amenable for physical verification. In case of significant shortfall in achieving physical targets, the Commission may require the licensee to explain the reasons, and may proportionately reduce the provision, including interest and return component made towards revenue requirement, in the next tariff proposal.

(4) The licensee may, at any time, during the tariff year, seek provision for additional capital expenditure to meet natural calamities involving substantial investment and the Commission shall examine and review these provisions in the manner as given in this regulation and approve their inclusion in the revenue requirement in the next period.

(5) The licensee shall get the Capital Investment Plan approved by the Commission

before filing ARR and Application for determination of tariff.”

4.4. Regulation 3 (v) of the Terms and Conditions for determination of Tariff for Transmission/Distribution of Electricity (under MYT framework) Regulations, 2009 (MYT Regulations) specifies as follows:-

“Chapter II, 3) v). Capital Investment Plan:

The licensee shall get the approval of the Capital Investment Plan for each year of the initial control period in accordance with the Regulation 17 of TNERC Tariff Regulations. It may be ensured that the approval of the Commission is obtained before tariff filing under MYT framework. The capital investment plan shall have capitalization schedules for each year of the control period.

The source of finance to meet the capital expenditure in each year of the control period shall also be furnished along with Capital Investment Plan.”

5.0 Approach followed

5.1The Petition for approval of CIP for the Control Period from FY 2019-20 to FY 2021-22 filed by TNSLDC was registered as M.P. No. 17 of 2019. After preliminary verification, during the hearing on 17.12.2019, the Petition was admitted. The petitioner was directed to host the petition for obtaining stakeholders comments, and thereafter compile the comments and furnish to the Commission with details of works to be carried out, funding, besides furnishing separate reply to stakeholder comments. Petitioner after hosting the petition and granting 15 days time to stakeholders to file their comments, informed that no comments were received from stakeholders. In the hearing on 10.3.2020, petitioner was directed to implead the Secretary to

Government, Finance Department, Government of Tamil Nadu. On 2.6.2020, petitioner was directed to file a fresh affidavit incorporating actual expenditure incurred for the financial year 2019-20 and modify financial requirements for FY20-21 deducting proportional expenses taking into account the lockdown period caused by the covid 19 pandemic. As directed by the Commission, petitioner filed a revised petition detailing the expenditure incurred during FY20, the objectives and justification for the investment proposals. Commission after analysing the proposals found that phasing of expenditures were not in tune with the slow progress due to the pandemic, sources of funding were not furnished. On 23..2.2021 Commission directed TNLDC to file the correct status considering actual spending as on date. The reply affidavit filed by TNSLDC has been analysed. The findings on the final proposals for the schemes for the Control Period from FY 2019-20 to FY 2021-22 and approval are rendered in the succeeding paragraphs.

6.0 Findings of the Commission:

6.1The petitioner has submitted scheme wise details for the control period FY 2019-20 to FY 2021-22 in accordance to the Commission's Tariff Regulations. Commission has conducted a detailed analysis of the schemes proposed by TNSLDC. In the process of scrutiny, additional details, clarification were sought from TNSLDC. The schemes have been viewed based on necessity of investment, discussions on alternate methods of achieving efficiency, life span, obsolescence of technology and optimization.

6.2 Commission had passed separate orders on intra State Transmission in 2012,2013. In the suomotu order on intra-State Transmission Tariff and other related charges passed on December 11, 2014. Commission reiterated the direction to TANTRANSCO to file a separate Petition for approval of SLDC's ARR in accordance with the Tariff Regulations. TANTRANSCO filed a Petition for True-up for the period from FY 2011-12 to FY 2015-16 and approval of Aggregate Revenue Requirement (ARR) for the Control Period from FY 2016-17 to FY 2018-19 and determination of Intra-State Transmission Tariff for FY 2017-18. Thereafter, SLDC filed the Petition for determination of ARR for SLDC for FY 2017-18 and 2018-19.

6.3 The Commission after review of the data made available passed the first Order on determination of ARR of SLDC for FY 2017-18 and FY 2018-19 and SLDC Charges for FY 2017-18 on 11.8.2017 considering provisional capital expenditure and capitalization details furnished by SLDC.

6.4 The Load Dispatch Centre of Tamil Nadu is divided into three control areas, viz., Chennai, Madurai and Erode and the area Load DespatchCentres in each area take care of the operation of the respective area.

6.5SLDC is functioning at Chennai with three Sub-Load DespatchCentres at Chennai, Erode and Madurai carrying out the grid management and taking care of the overall reliability, security, economy and efficiency of the power

system function for smooth evacuation of power from generating stations to the consumers. It is agreed that number of transactions of SLDC has increased manifold due to the integration of higher RE power and open access transactions. There is an increase in the number of generators and the number of sub stations and so is the demand.

6.6 Keeping this in view, the analysis and decision on each of the schemes is furnished.

6.6.1 Scheme I - ULDC SCADA upgradation

6.6.1.1 The proposal is an upgradation of old SCADA for monitoring of real time grid operation at cost of Rs.19.07 crores which has been completed. The entire capitalization of the scheme was planned for 2017-18. The scheme though approved in 2013 with a schedule of 12 months has been completed in 2016-17. The capital expenditure and capitalization is as per the approved cost though commissioning has been beyond the schedule. The balance amount of Rs.0.36 crores towards capital expenditure and capitalization as submitted in FY20 is approved. The cost for AMC may be covered in the normal O&M expenses.

6.6.2 Scheme II - Infrastructure for implementation of intra State ABT under SAMAST in Tamil Nadu and for Disaster Recovery (DR) Centre at Madurai Sub LDC

6.6.2.1 With the advent of real time market, Green auction, Intra State ABT, which is a credible settlement mechanism, is the need of the hour. SLDC themselves have stated that there are about 1000 sub stations to be integrated

in SCADA and there is an increase in the no. of generators. Commission has notified the Deviation Settlement Mechanism regulations which aims at bringing discipline to the grid. This scheme has commenced with the grant from PSDF in 2016. TNSLDC has completed the pilot run for the Deviation Settlement Mechanism for all entities and DSM process is under mock trial. Commission notes the considerable progress made in implementing Scheduling, Accounting, Metering and Settlement of Transactions (SAMAST). TNSLDC is directed to complete as per schedule taking care to make timely payments. The capital expenditure and capitalization furnished for FY 20 is based on actuals and therefore the capital expenditure and capitalization of Rs.2.95 crores for FY 20, Rs.4.77 crores for FY 21 and balance of Rs.5.59 crores for FY22 as furnished is approved. The timelines in utilizing the grant may be complied to avoid conversion of the same to debt. The back up centre at SSLDC/Madurai will increase the reliability of the system. Care must be taken to check for scalability and further upgradation when required.

6.6.3 Scheme III - Modernisation of SLDC

6.6.3.1 Proposal to procure furniture and do interior work for new SLDC control room etc is a need based capital investment. It transpires from the petition that the proposed expenditure is to create the same model of the existing infrastructure in the new building constructed for the functioning of SLDC. The proposal does not cover usage of existing assets, its life, decapitalisation and whether expenditure towards equipments include any increase in efficiency, creation of any additional back up facilities. The capital expenditure has been shown in the last FY22. Since the new building of

TANTRANSCO has been inaugurated where TNSLDC is to be housed, Commission approves 50% of capital expenditure for FY22. The balance expenditure may be covered in the next control period. Capitalization details as and when the works are completed may be provided in the next plan. Obtaining administrative approval may be hastened.

6.6.4 Scheme IV -Renovation and Modernization of SCADA offices, Disaster Recovery Centre and back up Renewable Energy Management Centre at Madurai LDC

6.6.4.1 The scheme as proposed is for construction of the building. Creation of REMCs(Renewable Energy Management Centres) are under the grant of PGCIL.Proposal does not state clearly the extent of building to be constructed, whether expenditure covers any of the equipments. A report detailing all works involved may be furnished along with administrative approval in the next plan. Part of the expenditure to the extent of Rs.0.03 crores is approved.

6.6.5 Scheme V - Modernisation of sub LDCs, REMCs & SCADA system located at Chennai,Madurai and Erode

6.6.5.1The details shown under the scheme show that the proposal includes replacement of computers and peripherals, servers, air conditioners and renovation of the furnitures,offices of the LDC building at Chennai,Madurai and Erode. Here, again the life of equipments, obsolescence of technology, disposal of old computers, de-capitalisation have not been discussed.

6.6.5.2Investment for a Rooftop solar plant is included in the CIP.The Rooftop solar plant benefits the SLDC and adds to the return on investment. It does not

fall under a scheme of capital expense to be recovered from customers. The size of the buildings to be constructed is not available. Further, administrative approval is yet to be obtained. Considering that SCADA and data acquisition is vital to the functioning of SLDC, equipments safety being of prime importance, Commission accords in principle approval to the scheme for Rs.7.1crores after deducting proportionate charges towards expenditure of Rooftop solar plants of 30 KW capacity. Considering the current rate of progress during the pandemic, a capital expenditure of Rs. 2.001crores is considered for FY22 with capitalisation of Rs.2crores in FY22.

6.6.6 Scheme VI - Performance security upgradation of ULDC EMS/SCADA system

6.6.6.1 Since data from all sub stations is vital for efficient and secure grid operation, upgradation of existing hardware, software and purchase of additional hardware under the scheme for Rs.6 crores is approved. Administrative approval may be expedited. However, a capital expenditure of Rs.3crores is accounted for FY 22 and the same amount considered for capitalization.

6.6.7 Scheme VII - Reliable Communication Project:

6.6.7.1 The scheme proposed is as per the directions of the Government of India to establish OPGW based F.O. Communication and Data Acquisition facilities for all 110 kV and above level sub-stations for monitoring, management and restoration of Electricity grids. The scheme is partly by grant (Rs.155.48 crores) and a mix of Debt and equity arranged by SLDC for the

balance amount of Rs.323.45 crores. SCADA is essential for effective working of Distribution systems. Section 5.3.3 of National Electricity Policy says, “5.3.3 ...When open access to distribution networks is introduced by the respective state Commissions for enabling bulk consumers to buy directly from competing generators, competition in the market would increase the availability of cheaper and reliable power supply. The Regulatory Commissions need to provide facilitative framework for non-discriminatory open access. This requires load dispatch facilities with state-of-the-art communication and data acquisition capability on a real time basis.”

6.6.7.2 Commission notes that LOA has been issued for supply, erection, testing and commissioning of OPGW for a distance of 10770 Kms at total cost of Rs.381.83 crores. Commission accorded approval in M.P No. 11 of 2021 for change in technology from SDH operated communication to MPLS-TP technology aware of the savings in cost and the need to transition to the MPLS-TP based technology. Considering the grant of Rs.155.48 crores sanctioned by Ministry of Power and the necessity of the scheme for reliable operations of SLDC, Commission grants in principle approval for the capital expenditure of Rs. 478.93 crores. The Protection & Communication wing of TANGEDCO is directed to file a report detailing chronological events, works involved, split up details for the expenditure and the revised DPR within two months of approval of this CIP. The capital expenditure and capitalization as submitted by TNSLDC each for an amount of Rs.36.73, Rs.260.00 for FY 21, FY 22 respectively is approved. The balance expenditure shall be covered in the next plan for FY 23.

6.6.8 Scheme VIII - Transmission and Distribution Program

6.6.8.1 The approval sought is for commissioning of fiber optic terminal equipment for efficient communication between SLDC and 34 nos. 230 KV sub stations and 9 nos. 110 KV sub stations of Hydro power stations. Considering the importance of activity of operations efficiently by TNSLDC envisaged in the Electricity Act,2003 Commission accords in principle approval for the scheme. The capital expenditure and capitalization of the cost of project of Rs.15.83 crores proposed is for FY22. Considering that the LOA has been issued and the works have progressed, Commission accords approval for 60% of cost towards capital expenditure and capitalisation for FY22.

6.6.9 Scheme IX- Artificial Intelligence based Active Grid Network Management (ANM) Project-

6.6.9.1 This scheme is funded by Government of Tamil Nadu. A robust communication system and artificial intelligence is essential for SLDC which handles about 5000 transactions per day. Work is stated to be under progress. The scheme is approved. The capital expenditure and capitalization of Rs.6 crores for FY22 is approved.

6.6The petitioner was directed to implead the Secretary to Government, Finance Department, Government of Tamil Nadu. Remarks have not been furnished. TNSLDC has been ring fenced and functions as a separate entity headed by Chairman/TANTRANSKO. Equity assistance shall be required from GoTN.

6.7The table below is the capital expenditure and Capitalisation approved by the Commission. The details of capital expenditure and capitalization submitted in the petition and that approved by the Commission showing justification are shown in Annexure.

Table 4 : Capital Expenditure and Capitalisation submitted by the petitioner and that approved by Commission (Rs.in Crores)

Sl. No	Description of works	Cost of scheme Rs. In crores	Submission of TNSLDC			Approved by the Commission			Submission of TNSLDC			Approved by the Commission		
			Capital Expenditure Rs. in crores			Capital Expenditure Rs. in crores			Capitalisation Rs. in crores			Capitalisation Rs. in crores		
			2019-20 (Actual)	2020-21	2021-22	2019-20	2020-21	2021-22	2019-20 (Actual)	2020-21	2021-22	2019-20	2020-21	2021-22
1	ULDC SCADA upgradation	19.07[7.45 - AMC; 11.26 (incurred)]	0.36	0.00	0.00	0.36	0.00	0.00	0.36	0.00	0.00	0.36	0.00	0.00
2	IT infrastructure for Intrastate ABT under SAMAST and for Disaster Recovery (DR) Centre at Madurai Sub LDC.	13.31	2.949	4.77	5.59	2.949	4.77	5.59	2.949	4.77	5.59	2.949	4.77	5.59
3	Modernisation of SLDC	10.50	0.00	0.00	10.50	0.00	0.00	5.25	0.00	0.00	10.50	0.00	0.00	5.25
4	Renovation & Modernization of battery rooms for DR centre, REMC, SCADA offices,	0.06	0.00	0.00	0.06	0.00	0.00	0.03	0.00	0.00	0.06	0.00	0.00	0.00
5	Modernization of existing Sub SLDCs & REMCs located at Chennai, Madurai and Erode.	7.10	0.001	0.00	5.64	0.001	0.00	2.00	0.001	0.00	5.64	0.00	0.00	2.00
6	Performance Security upgradation of existing ULDC	6.00	0.00	0.00	6.00	0.00	0.00	3.00	0.00	0.00	6.00	0.00	0.00	3.00

	EMS/SCADA													
7	Reliable Communication	478.93	0.00	36.73	260.00	0.00	36.73	260.00	0.00	36.73	260.00	0.00	36.73	260.00
8	Transmission and Distribution Programme– Providing Fiber optic terminal equipment in 34 Nos 230 KV SS and 9 Nos 110 KV SS	15.83	0.00	0.00	15.83	0.00	0.00	9.50	0.00	0.00	15.83	0.00	0.00	9.50
9	Artificial Intelligence based Active Grid Network Management (ANM)	6.00	0.00	0.00	6.00	0.00	0.00	6.00	0.00	0.00	6.00	0.00	0.00	6.00
	Total Rs.in crores	556.80	3.31	41.50	309.62	3.31	41.50	291.37	3.31	41.50	309.62	3.309	41.50	291.34

6.8Funding of capital expenditure approved by the Commission is tabulated below:

Sl.No.	Particulars	2019-20 Rs. in crores	2020-21 Rs. in crores	2021-22 Rs. in crores
1.	Grant	2.95	16.04	88.23
2.	Equity	0.11	5.48	41.07
3.	Debt	0.25	19.98	162.04
	Total	3.31	41.50	291.34

6.9Directions:

(a)For all the Load dispatch and communication schemes, commencing during the Control Period from April 1, 2019, TNSLDC shall submit the year-wise actual capital expenditure incurred along with detailed justification for delay, if any, at the time of approval of actual capital expenditure and capitalisation.

(b) TNSLDC shall maintain the record for the scheme-wise actual capital expenditure incurred and actual capitalisation done separately for the schemes commencing after April, 2019, which shall be submitted to the Commission at the time of next Tariff Petition. The Commission will approve the actual Capital expenditure and actual capitalisation based on such information, subject to prudence check.

(c) The Petitioner is directed to submit cost benefit analysis to the Commission along with details of life of assets, cost incurred for each scheme, physical details of works carried out, capitalisation, decapitalisation, after completion of schemes on annual basis.

(d) The Petitioner shall submit the actual source-wise funding for each

scheme approved in this Order along with the next Tariff Petition. The Commission will approve the actual capital expenditure and capitalisation, after prudence check.

(e) The petitioner is directed to submit feasibility reports containing technical details and justification, cost assessments, possibility of phasing of investments, impact/benefits to customers for those schemes involving expenditure above Rs.10 crores.

(f) The petitioner shall comply with the directions issued under each scheme in this order.

(g) The petitioner shall seek prior approval of the Commission i) when there is any major change in technology, and ii) when the total capital expenditure exceeds 5% of the approved expenditure in this capital investment plan.

(h) The Government of Tamil Nadu shall provide equity assistance to the portion of equity provided in this Capital Investment Plan for each FY. The petitioner shall approach GoTN to provide equity assistance for the investments made as approved in this order.

(Sd.....)
(K.Venkatasamy)
Member (Legal)

(Sd.....)
(M.Chandrasekar)
Chairman

/True Copy /

Secretary
Tamil Nadu Electricity
Regulatory Commission

ANNEXURE

Capital Expenditure and Capitalisation submitted by the petitioner and that approved by Commission (Rs.in Crores)

Sl. No.	Description	Cost of scheme Rs. In crores	Approval	Date of completion (actual/anticipated)	Submission of TNSLDC			Approved by the Commission			Submission of TNSLDC			Approved by the Commission			Justification	Funding	Present status
					Capital Expenditure Rs. in crores			Capital Expenditure Rs. in crores			Capitalisation Rs. in crores			Capitalisation Rs. in crores					
					2019-20 (Actual)	2020-21	2021-22	2019-20	2020-21	2021-22	2019-20 (Actual)	2020-21	2021-22	2019-20	2020-21	2021-22			
1	ULDC SCADA upgradation	19.07 (7.45-AMC; 11.26 incurred)	P.O. No.888 dt. 19.07.2013)	Sept. 2016	0.36	0.00	0.00	0.36	0.00	0.00	0.36	0.00	0.00	0.36	0.00	0.00	Expenditure incurred is to upgrade old SCADA system installed prior to 2013 for effective monitoring of SLDC in real time grid operation. (AMC Charges is being included in the O&M Expenses)	Entire expenditure met out from SLDC Fund.	Work Completed.
2	Establishment of IT infrastructure for implementation of Intrastate ABT under SAMAST in Tamil Nadu and establishment of IT infrastructure for Disaster Recovery Centre at Madurai Sub LDC.	13.31	B.P. No. 61, dt. 09.03.17	28.05.2021	2.949	4.77	5.59	2.949	4.77	5.59	2.949	4.77	5.59	2.949	4.77	5.59	Procurement of server, network accessories and Software towards implementation of AMR to Wind farm, Co-gen, solar and other generators. Procurement of IT infrastructure by utilising balance PSDF fund for establishment of DR Centre at SLDC/Madurai.	90% PSDF is 11.98 Cr. Balance 10% is being met from SLDC fund. Rs. 31.24 lakhs paid from SLDC fund.	Works are under progress

3	Modernisation of SLDC																		
a	Interior and furniture etc for New SLDC control room proposed at new TANTRANSCO building	3.00			0.00	0.00	3.00	0.00	0.00	1.50	0.00	0.00	3.00	0.00	0.00	1.50	Expenditure proposed is for furniture and interior work for New SLDC control room.	To be tied up with REC/PFC	Seeking Adm. Approval is under progress.
b	SLDC equipments including SCADA System, Video wall etc for New SLDC control room proposed at new TANTRANSCO building including IT hardware and software/software license.	7.00			0.00	0.00	7.00	0.00	0.00	3.50	0.00	0.00	7.00	0.00	0.00	3.50	Proposal is for SCADA System and Video wall etc including IT hardware and software.	To be tied up with REC/PFC	Seeking Adm. Approval is under progress
c	Video Conference System for New SLDC control room proposed at new TANTRANSCO building	0.50			0.00	0.00	0.50	0.00	0.00	0.25	0.00	0.00	0.50	0.00	0.00	0.25	Video Conference facility to interact with NLDC, RLDC and Sub LDCs.	To be tied up with REC/PFC	Seeking Adm. Approval is under progress
4	Renovation & Modernization of the old FEP/MUX room, old battery room for accommodating the new RE Generator servers for Disaster Recovery Centre and REMC, SCADA offices, including replacement of old defective window air conditioners with new split air conditioners	0.06			0.00	0.00	0.06	0.00	0.00	0.03	0.00	0.00	0.06	0.00	0.00	0.00	New Building is essentially required for Disaster Recovery Centre for data security and speedy restoration of SLDC operations during disaster at Sub LDC/Madurai and for REMC at Sub LDC/Madurai.	To be tied up with REC/PFC	Seeking Adm. Approval is under progress
5	Modernization of Existing Sub LDCs & REMCs located at Chennai, Madurai and Erode.	7.10			0.001	0.00	5.64	0.001	0.00	2.00	0.001	0.00	5.64	0.00	0.00	2.00	Renovation & Modernisation of Sub LDCs, REMCs & SCADA System at Chennai, Madurai and Erode. ie. Building works at SLDC Erode, Solar rooftop at Erode and	Fund will be tied up with REC/PFC or Govt Agencies	Seeking Adm. Approval is under progress.

																	Madurai Sub LDC, Purchase of new servers, computers, Laptops, printers, televisions, SCADA & Server room at Erode Sub LDC, Tools & Plants including scientific instruments for SCADA Communication, Furniture, AMR reading display are essentially required for smooth grid operation.		
6	Performance Security up-gradation of existing ULDC EMS/ SCADA system including upgradation of remote consoles OS to Window'10, Provision of additional 4 Nos of ULDC SCADA remote consoles and provision of 32 inch widescreen display monitors for Operators at Sub LDC Madurai & Erode including REMC/Madurai & etc.,	6.00			0.00	0.00	6.00	0.00	0.00	3.00	0.00	0.00	6.00	0.00	0.00	3.00	Existing E-terra EMS/SCADA system is capable of getting data from more than 550 Stations and in near future, about 500 stations to be integrated. Hence, the existing data servers are to be upgraded to meet out additional stations and to access additional browsing displays. The existing servers have to be upgraded for both hardware and software for better performance and security in long perspective.	Fund will be tied up with REC/PFC or Govt Agencies	Seeking Adm. Approval is under progress.
7	Reliable Communication																		
a	Supply, erection, testing & commissioning of 48	380.68	L.O.A. No.	May 2021	0.00	36.73	200	0.00	36.73	200	0.00	36.73	200	0.00	36.73	200	Provision of OPGW based Fiber Optic	PSDF : Rs.105.93 Cr. Balance	LoA Issued.

	fibres OPGW for establishment of fibre optic connectivity to 110 KV and above Level Sub Stations under Reliable Communication Scheme		999 dated 29.11.2019														Communication with Data Acquisition System for monitoring, management and restoration of Electricity grids.	Amount: being tied up with REC.	
b	Supply, erection, testing & commissioning of end equipment to terminate the Fibre Optic Cable in 110 KV and above Level Sub Stations including Data acquisition servers, UPS, Battery, battery charger, including civil works for server room for integrating data and voice communication under Reliable Communication scheme.	Rs.99.10 Cr. (Amount reduced to Rs. 98.25 Cr. due to inclusion of new MPLS-TP Technology FOTEs)	Proceedings No. 32. dated 25.05.2018	Dec 2021	0.00	0.00	60.00	0.00	0.00	60.00	0.00	0.00	60.00	0.00	0.00	60.00	For monitoring, management and restoration of Electricity grids.	PSDF : Rs.49.55 Cr. Balance is being tied up with REC.	Approval of proposal for change in technology in FOTE in MP.No. 11 of 2021 approved by Commission. Tender to be floated.
8	Transmission and Distribution Programme : Supply, erection, testing & commissioning of Fiber optic terminal equipment in 34 Nos 230 KV SS and 9 Nos 110 KV SS in Hydro Stations existing/new 230 kV substations having fibre optic connectivity	15.83	LoA 1009 dated 08.10.2020	07.10.2021	0.00	0.00	15.83	0.00	0.00	9.50	0.00	0.00	15.83	0.00	0.00	9.50	Commissioning of fiber optic terminal equipment for efficient communication between SLDC and sub stations	34 Substation projects funded by various financial institutions like PFC, REC & TNIPP etc.,	LoA Issued.
9	Artificial Intelligence based Active Grid Network Management (ANM)	6.00	TN Govt. G.O No.39 dated 29th May, 2019.	2020-21	0.00	0.00	6.00	0.00	0.00	6.00	0.00	0.00	6.00	0.00	0.00	6.00	The ANM is a concept that helps in situation of network constraints by actively managing network devices autonomously in real time.	Funded by TN Govt. Rs. 6 Cr. has been received from Govt. of Tamil Nadu and deposited to SLDC account.	Work under progress
Total Rs. in crores					3.31	41.50	309.62	3.31	41.50	291.37	3.31	41.50	309.62	3.309	41.50	291.34			

