

1) a) Safety Manual Chapter I- 14(1)Pg.No.3 in English & 4 in Tamil (2)

Line clears are permits issued for working on lines or equipments which are in service but disconnected from mains or supply for the purpose of the work

b) Code of Technical Instructions-2.03.09 Pg.No.11

Battery room equipment should include acid, hydro meters, Thermometers, Inspection lamps, cell testing volt meter and other accessories. (3)

c)The Tamil Nadu Transparency in Tender Rules 2000-Rule 22 Pg.No.16 (5)
Any five of the following

- 1.All the envelopes received containing tenders shall be counted.
2. All the tenders received in time shall be opened.
3. Any tender received subsequently shall not be opened and shall be returned unopened to the tenderer
- 4.On opening the tender the members of the tender scrutiny committee shall initial the main bid including the prices and any corrections.
- 5.A record of the correction noticed at the time of the bid opening shall be maintained.
6. The name of the tenderers and the quoted prices should be read out aloud.
- 7.The fact whether EMD has been submitted and other documents required produced may be indicated, but this shall be merely an examination of the documents and not an evaluation
- 8.Minutes of the tender opening shall be recorded. The signatures of the tenderers present shall be obtained unless any of the tenderers or his representative refuses to sign the minutes.

d) Code of Technical Instructions- -7.02 Pg.No.291,292,293 (3)
Any six of the following -Each -1/2 mark

- 1)Insulation and continuity tests on wiring
- 2)Secondary injection tests
- 3)primary injection tests

- 4)circuit breaker timing tests
- 5)Testing of series trip relays
- 6)Testing of Trip circuits
- 7)Checking up of flag indicators.
- 8)Checking up of insulation of current Transformers and potential Transformers

e) The Tamil Nadu Electricity Grid code -2 (39) Pg.No.4 (3)

Inter State Transmission System (ISTS) . (1)

Any two of the following -Each -1 mark (2)

It includes

- i) Any system for the conveyance of electricity by means of a main transmission line from the territory of one State to another State
- ii) The conveyance of energy across the territory of an intervening State as well as conveyance within the State which is incidental to such inter-state transmission of energy
- (iii) The transmission of electricity within the territory of State on a system built, owned, operated, maintained or controlled by CTU.

f)TNEB Department Manual Volume -I-426 Pg.No.262 (4)

A Bin card is hung up outside each Bin or rack in the stores.The minimum and maximum quantities to be stocked in respect of the material as fixed by the Superintending Engineer are noted in it. Each time articles are placed into or taken out of a bin or rack and entries concurrently made in the bin card and the balance struck. Where materials are stored in yards ,Bin card should be separately maintained by the store keepers and all issues and receipts concurrently noted.The Bin card should show the balances at any moment and this should tally with the numerical accounts.This agreement between the Bin card and the numerical ledger will not however exist in regard to issues of materials without requisition .In these cases while the posting of the issues is made in the Bin card at the time of issue,the SIBs are not prepared nor the posting made in the numerical ledgers until the receipt of requisitions.

2) a)Electricity Act -2003 -Act 2-23,15 Pg.No.4,3 (4)

EACH-2 Marks

Electricity means electrical energy generated ,transmitted,supplied or traded for any purpose or used for any purpose except the transmission of a message.

Consumer means any person who is supplied with electricity for his own use by a licensee or the Government or by any other person engaged in the business of supplying electricity to the public under this act or any other law for the time being in force and

includes any person whose premises are for the time being connected for the purpose of receiving electricity with the works of the licensee, the Government or such other person, as the case may be.

b) Tamil Nadu Electricity -Distribution Code-Regulation- 2(h,j) Pg.No.186 (2)

"Connected Load" means the aggregate of the manufacturer's rating of all equipments connected to the consumer's installation and of all portable equipments and also the capacity of the power source required to test manufactured products and repaired equipment in the installation;

"Contracted Load" means the load specified in the agreement between the consumer and the Licensee engaged in the business of supplying electricity to him.

c) Code of Technical Instructions 13.03.02 Pg.No.392,393 (5)

Medium and Low voltage line and service lines:

1)For any flat roof ,open balcony, Verandah, roof and lean to roof

i)When the line passes above the building a vertical clearance of 8 feet(2.5m)for the nearest point.

ii)When the line passes adjacent to the building a horizontal clearance of 4 feet(1.25m) HV lines

1. Where a HV over head line upto and including 33 KV passes above or adjacent to any building or part of a building it shall have a maximum safe vertical clearance of not less than 12 feet(3.75m)above the highest part of the building immediately under such line

2.The horizontal distance between the nearest conductor and any part of such building shall on the basis of maximum deflection due to wind pressure be not less than

a)For HV lines upto and including 11 KV = 4 Feet(1.25M)

b)For HV lines above 11 KV and upto and including 33 KV =6 Feet(1.85M)

d)) The Tamil Nadu Electricity Grid code -4(9) Pg.No.15 (3)

District Committees shall be constituted in each district by Government of Tamil Nadu to:

- a. coordinate and review the extension of electrification in each district;
- b. review the quality of power supply and consumer satisfaction
- c. promote energy efficiency and its conservation.

e) Tamil Nadu Electricity Supply Code-Regulation 5(7) Pg.No.145 (6)

i)Every application for transfer of name consequent to the death of the consumer shall be in form(1)) in Appendix to this Code accompanied by

(a)Legal heirship certificate from the Tahsildar concerned or proof of ownership such as local body tax receipts (latest).

(b) No objection certificate from other legal heirs, if any, (or) an indemnity bond in Form (3) in Appendix to this Code on non-judicial stamp paper for a value of Rs80/- and a sworn-in affidavit and authenticated by a Notary Public or by a gazetted officer to show the status of other legal heirs.

(c) Fresh application with fee to be specified by the Commission and agreement form.

(ii) Every application for transfer of name, in other cases, shall be in Forms (1) and (2) in Appendix to this Code accompanied by

(a) The document supporting the transfer with an undertaking in Form (4) in Appendix to this Code

(b) Consent letter from the consumer for the transfer of the Security Deposit if it is not included in the document supporting the transfer. Where no such consent letter can be produced, the applicant shall pay fresh Security Deposit.

(c) Fresh application with fee to be specified by the Commission and agreement form.

3) a) Code of Technical Instructions-2.04 Pg.No.12 (5)

1) Initial charging

2) Trickle charging

3) Routine charging

4) Quarterly Equalising charging

5) Special charging

b) Safety Manual –Chapter I-14(4) Pg.No.3 in English & 5 in Tamil (5)

When written permits cannot be given, line clear should be given and taken over phone. In such cases, substances thereof shall be repeated by the person who receives the line clear message and shall be confirmed by the sender to ensure that both parties are quite clear as to its purport. Such instruction shall be recorded only in the line clear permit books at both sending and receiving ends. Duplicate copies of the line clear permit should be sent by post as soon as possible for record at either end after duly cancelling the same

c) Tamil nadu Electricity Supply Code-Regulation -2(n) Pg.No.138 (4)

EACH-2 Marks

Load Factor means the ratio of the Average Demand for the month in terms of Kilowatts to the Maximum Demand for the month in terms of Kilowatts and the Load Factor shall be calculated to three decimal places and rounded off to two decimal places

Electricity Act -2003-Act2(41) Pg.No.5

Local Authority means any nagar panchayat, Municipal council, Municipal corporation, panchayat constituted at the village, intermediate and District level, body or port commissioners, or other authority legally entitled to, or entrusted to the union or state Government with the control or management of any area or local fund.

d) TNEB Tender Regulation 1991-Regulation 9(1) Pg.No.13 (6)
Any Six of the following

The tender notice shall contain a short description of the materials to be supplied or work to be done besides the following

1. The time and place where the tender documents may be perused.

2. The authority from whom forms, plans, specifications and the tender documents may be obtained.

3. The authority to whom tender should be submitted .

4. The last date and time before which the tender shall be submitted.

- 5.The place ,Date and Time when the tender shall be opened.
- 6.Probable amount of the contract
- 7.Cost of the tender document
- 8.The quantum of EMD payable
- 9.Where the two Part tender is invited, the tender notice shall indicate the form in which the Two part tender shall be submitted.

4) a) Electricity Act -2003-Act 28 Pg.No.18 (5)

(1)The Regional Load Despatch Centre shall be the apex body to ensure integrated operation of the power system in the concerned region

(2) The Regional Load Despatch Centre shall comply with such principles, guidelines and methodologies in respect of the wheeling and optimum scheduling and despatch of electricity as the Central Commission may specify in the Grid Code

(3) The Regional Load Despatch Centre shall

- (a) be responsible for optimum scheduling and despatch of electricity within the region, in accordance with the contracts entered into with the licensees or the generating companies operating in the region;
- (b) monitor grid operations;
- (c) keep accounts of the quantity of electricity transmitted through the regional grid;
- (d) exercise supervision and control over the inter-State transmission system; and

(e)be responsible for 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 Code.

4) The Regional Load Despatch Centre may levy and collect such fee and charges from the generating companies or licensees engaged in inter-State transmission of electricity as may be specified by the Central Commission

b) . Code of Technical Instructions-9.06.02 Pg.No.325 (2)

Major substations	-1 ohm
Other substation	-2 ohms
Distribution Transformers	-5 ohms

c) The Tamil Nadu Transparency in Tender Rules 2000 –Rule 29(2) Pg.No.19 (5)

In determining the lowest evaluated price, the following factors shall be considered, namely:-

- a)the quoted price shall be corrected for arithmetical errors
- b) in cases of discrepancy between the prices quoted in words and in figures, lower of the two shall be considered;
- c)adjustments to the price quoted shall be made for deviations in the commercial conditions such as the delivery schedules and minor variations in the payment terms which are quantifiable but deemed to be non-material in the context of the particular tender;
- d) "the evaluation shall include all central duties such as customs duty and central excise duty and sales tax as a part of the price, as detailed below:
 - i)in evaluation of the price of an imported item, the price has to be determined inclusive of the customs duty;

- ii) in evaluation of the price of articles which are subject to excise duty, the price has to be determined inclusive of such excise duty;
- iii) in a tender where all the tenderers are from within the State of Tamil Nadu, or where all the tenderers are from outside the State of Tamil Nadu, the sales tax shall be included for the evaluation of the price; and
- (iv) In a tender where the tenderers are both from the State of Tamil Nadu as well as from outside the State of Tamil Nadu,
The sales tax under the Tamil Nadu General Sales Tax Act, 1959(Tamil Nadu Act 1 of (1959) shall be excluded for the evaluation of the price".
- (e) in the case of purchase of equipment, the operation and maintenance and spare part costs for appropriate periods as may be specified in bid documents may be quantified, where practicable and considered.
- (f) the evaluation and comparison shall include fifteen percent price preference for domestic small scale industrial units and ten percent price preference for the Public Sector Undertakings of the Government in respect of products and quantities manufactured by them.

d) Tamil Nadu Electricity -Distribution Code-ABBREVIATIONS Pg.No.234 (3)

RCC-Reinforced Cement Concrete
 FMB-Field Measurement Book
 R & D-Research and Development

e) Safety Manual- Chapter VI-1 Pg.No.54 in English & 85 in Tamil (5)

1. Switch of supply as quickly as possible but if that would involve more time than putting the patient away ,do the later.
2. Standing on a dry, insulated surface like a wooden chair, rubber or coir matting. Separate the victim from the electrical contact using a dry stick, dry rope, dry cloth, paper or other non conductors. On no account should bare hands be used .
3. Where accident is on HT lines or equipment special care has to be exercised .
4. Send for the nearest Doctor. The names, addresses and telephone numbers of Doctors and Hospitals within easy reach of the station/works should be maintained.
- 5.If the affected person is apparently not breathing proceed to give artificial respiration without delay. Every moment of delay is serious.
6. Any foreign body like tobacco, false teeth ,Chewing gum etc. Should be removed from the victims mouth and throat carefully.

5) a) Tamil Nadu Electricity Supply Code-Regulation 19-6(b) Pg.No. 155 (4)

"unauthorized use of electricity" means the usage of electricity --

- i) by any artificial means; or
- ii) by a means not authorized by the concerned person or authority or Licensee; or
- iii) through a tampered meter; or
- iv) for the purpose other than for which the usage of electricity was authorized

b) Code of Technical Instructions-9.01.05 Pg.No.318 (3)

The touch potential is that appears across hand and feet and step potential is that appears across the feet. It should be as low as possible say of the order of 25 to 30 V.

C) Safety Manual- Chapter IV-7(2) Pg.No.42 in English & 64 in Tamil (5)

Before going up a pole the work man should fix in his mind the conditions on the pole and their relation to the job which he is about to do. He should determine in his own mind what is the best working position, How best to protect himself in the working position electrically and physically. Though the conductors on which work is to be carried out may be switched off, there may be other conductors which may be alive such as street light wire or feeder from another substation terminating at the same location. This have to be carefully looked into.

d) Code of Technical Instructions-3.06 Pg.No.79 (4)

If two or more Transformers are to be operate in parallel, their satisfactory performance requires that they are

- 1)the same polarity
- 2)The same phase angle difference between HV and LV windings and the same phase sequence.
- 3)The same voltage ratio
- 4)The same per unit(or percentage)impedence
- 5)The difference in KVA capacity should not exceed the ratio of 3:1

e) TNEB Department Manual Volume – I - 446 Pg.No.278 (4)

Stock found in excess during verification should be taken as receipts both in the quantity and value accounts, the valuation being made at the current market rate. The value of the stores found surplus should be credited as a revenue receipt or a receipt on capital account as the case may be. In the case of stock found deficient, the accounts should be examined to see if the deficiency is due to error in accounts. If it is not due to error in accounts, the deficiency should shown as issues both in the quantity and value columns in the ledger and the value debited to "unadjusted items 091", pending recovery from the person responsible for the deficiency or sanction to write off as the case may be.

6) a) Tamil Nadu Electricity Distribution code – regulation 37 Pg.No.210 (5)

The cost of shifting a new service connection for which line is laid but service connection is yet to be effected shall be borne by the intending consumer. The intending consumer shall pay the above charges in advance in full. The shifting work will be taken up only after the payment is made. The estimate will cover the following:

- (a)Charges for dismantling at the old site.
- (b)Charges for transport from the old site to the new site.
- (c)Charges for re-erection at the new site.
- (d)Depreciated value of retrievable materials, if any, not used at the site should be credited to the consumer
- (e) Cost of new materials including transport, if required
- (f) Cost of irretrievable materials at depreciated value.
- (g) Overhead charges

b) Tamil Nadu Transparency in Tenders rules - 2000 – Rule – 4 Pg.No.5 (3)

Procurement of different categories shall be effected by the following methods of tendering, namely:

- i) Piece-work contract
- ii) Lump sum contract
- iii) Turn-key contract
- iv) Multi-stage contracting including pre-qualification and two-cover system and
- v) Fixed rate contract

c) Code of Technical Instruction – 5.02 Pg.No.203 (3)

The basic operation of an arrester is simple. Its main function are to sense, limit and discharge the over-voltage surges-lightning or system generated-to earth. In its normal state, it acts as an insulator. When a high voltage surge impinges, it turns into conductor of negligible resistance in an infinitesimal time and returns to its original insulating state so as to get ready for meeting the next over-voltage wave. Thus, reliable surge arresters constitute the first rung in the protective ladder against over-voltages.

d) Code of Technical Instruction – 10.04.02 Pg.No.343 (5)

i) Construction

It is made in a variety of sizes, The important parts and contents of a chemical foam type fire extinguisher (9litre capacity) are given below. The extinguisher consists of two containers, the inner and the outer. The outer container holds a solution of sodium bicarbonate to which a foam stabilizer is added. The inner container (a long metal tube) has a solution of Aluminium Sulphate.

ii) Method of Operation

Remove the extinguisher from the socket. Pull the knob and turn the extinguisher over the ensure the mixing of two liquids. Then direct the jet of foam at the fire. Do not direct the jet directly into the liquid under fire since this will drive the foam beneath the surface and render it ineffective. Always direct the jet with a gentle sweeping movement so that the foam is allowed to drop down and lie on the surface of the liquid. Normally the jet from a foam extinguisher will have a length of atleast 6 metres.

e) Tamil Nadu Electricity Distribution Code – Chapter – 3 (5) Pg.No.189 (4)

Tamil Nadu Electricity Regulatory Commission (TNERC)

The functions of Commission as set out in the Act and rules made there under and in particular, to,

- (i) determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk, and retailers the case may be within the State;
- (ii) introduce non-discriminatory open access as per the provisions contained in the Act and in phases. Where open access has been provided to a category of consumer, the Commission shall determine the wheeling charges and surcharge thereon;

(iii) regulate electricity purchase and procurement process of distribution licensees including the price at which the electricity shall be procured from the generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the State

(iv) facilitate intra state transmission and wheeling of electricity;

(v) specify and enforce standards with respect to quality, continuity and reliability of service by Licensees

7. (a) Code of Technical Instruction – 8.01 Pg.No.309 (3)

PLCC – Power Line Carrier Communication

Outdoor Equipment consists of (1) Wave Trap; (2) Coupling capacitor (cc) (3) Coupling capacitor with potential devices (CCPT) (4) Line matching unit (LMU) and (5) Co-axial cable.

b) Code of Technical Instruction – 13.13.02 Pg.No.403 (5)

Area wireman is responsible for the works and line inspector/Foreman is responsible for the completion of works.

Monthly maintenance works:

a.Maintaining the transformer yard and the earth-pits neat and tidy and watering the earth-pits

b.Cleaning the entire transformer including the bushings

c.Checking the oil level and reporting if the level is below the mark

d.Checking for oil leaks and reporting if any noticed.

e.Checking the earth connections

f.Reconditioning the breather(by reactivating silicagel or replacing it if necessary)

g.Checking the LT fuses and renewing them if necessary

c) The Tamil Nadu Electricity Grid code –8 , 6 (ii) Pg.No.59 (4)

All the end users, distribution licensees, transmission licensees and STU are expected to provide local VAR compensation such that they do not draw VARs from the HV Grid. VAR compensation has to commence in the following order.

- Consumer end
- Distribution transformer end
- At the substations end of 11 / 22 KV distribution feeders
- Substations
- Generating stations

d) TNEB Department Manual Volume – 1 – 515 Pg.No.328,329 (5)

A revised estimate must be submitted when the sanctioned estimate is likely to be exceeded, by more than five per cent for any cause whatever, or When material developments or deviations have necessitated revised administrative approval. It must be accompanied by a report showing the progress made to date and explaining fully the cause of the revision. The revised estimate need not contain details of items which are not altered, but merely a note to that effect; but the altered items should be shown in a comparative statement. It is the duty of the Divisional Engineer to see that a revised estimate is prepared and disposed of immediately when the necessity arises. If however excesses occur at such an advanced period in the construction of a work as to render the submission of a revised estimate purposeless, the excesses if beyond the powers of the Superintending Engineer to pass must be explained in a completion report.

e) Tamil Nadu Electricity Supply Code – regulation 11 (4) Pg.No.150 (3)

Where the meter becomes defective immediately after the service connection is effected, the quantum of electricity supplied during the period in question is to be determined by taking the average of the electricity supplied during the succeeding four months periods after installation of a correct meter, provided the conditions in regard to the use of electricity in respect of such Low Tension service connections are not different. The consumer shall be charged monthly minimum provisionally for defective period and after assessment the actual charges will be recovered after adjusting the amount collected provisionally.

8) a) Electricity Act – 2003 – Act – 140 Pg.No.65,66 (2)
Act-140

Penalty may extend to Ten Thousand Rupees

b) Safety Manual – Chapter -V -2(5) Pg.No.48 in English & 74 in Tamil (3)

Avoid undue strain on gloves when putting them on, or taking them off. Don't expose them unnecessarily to extreme heat or cold, always put them away clean, preferably in a cool place.

c) Tamil Nadu Electricity Distribution Standards of performance regulations – 21(3), (6) Pg.No.16 (2)

- i. Replacement of meters - Rs.100/- for each day of delay subject to a maximum of Rs.100/-
- ii. Responding to consumer's complaints - Rs.25/- for each day of delay subject to a maximum of Rs.250/-

d) Tamil Nadu Electricity Board Manual Volume – II-Item No.6 Pg.No.4 (4)

Sl.No.	AUTHORITY	POWERS(IN Rs)
1	Chairman	Full Powers
2	Chief Engineer	20 Lakhs upto 2 MVA
3	Superintending Engineer	2 Lakhs for 3 years upto 0.75 MVA
4	Executive Engineer	1 Lakh upto 130 HP or 97 KW/LT only for period of 1 Year
5	Assistant Executive Engineer	10,000 upto 25 KW /LT only for a period of 6 months

e) Code of Technical Instruction - 3.03.20 Pg.No. 66 [5]
Any five of the following-Each-1Mark

- a) Immediately on actuation of the Buchholz relay the transformer should be isolated and tested in detail. Any gas available in the Buchholz chamber should be subject to the chemical tests as per instructions.
- b) Whether gas collection is observed or not the transformer should be tested by the territorial MRT staff and specific comments of the MRT got recorded. The MRT staff should analyse their observations with reference to the pre-commissioning test results and furnish their comments. All the prescribed tests must be conducted by the MRT staff.

c) The special Maintenance staff should immediately arrange for testing the oil. All the test results must be properly recorded with specific comments.

d) Every power Transformer should have its History Register available in the sub-stations where it is in service.

Relevant Test reports and the corresponding comments as and when furnished by MRT, GRT, Special maintenance or Transformer Erection Staff should form part of the History Register.

e) Buchholz relay action should not go without proper intimation and recording. Every occurrence should be recorded in a separate register and maintained properly. Immediate intimation about the occurrence should be given to all concerned.

f) For every Buchholz action in a Power Transformer, the oil must be got tested for "Dissolved Gas Analysis" and the test values recorded.

g) Similarly for every Buchholz action, arrangements must be made for the chemical test of the gas (as per instructions) immediately. Otherwise, if the gas is left for a long time in the Buchholz relay, some constituents of the gas may dissolve in the oil modifying the composition of the gas originally collected in the Buchholz Chamber, leading to misconception about the happenings inside the transformer.

h) In several cases, it is seen that the significance of measurements of magnetising current in power transformers is not appreciated. It is desirable that the measurements are made on both H.T & L.T sides on all the phases, and recorded properly whenever there is an occasion for testing the transformer. A comparative study of these values over an extended period will provide a definite pointer to the condition of the core and the windings of the transformer.

f. Code of Technical Instruction 4.09 Pg.No.181

(4)

SF6 gas has

1. high dielectric strength which is a function of its density

2. High heat transfer property

3. Pressure changes as a function of temperature are very moderate, thereby making it well suited for large temperature variations.

4. its deionisation characteristics is particularly suited to withstand the high ratio of rise of dielectric voltage stress appearing across the breaker contacts

5. Its physical and chemical properties make it ideal for switch gear application

6. it is non toxic, non corrosive, colourless, odourless, non inflammable and physically inert.