

ANSWER SHEET

- 1) i) Ans: (b) **Connection to be done first in the ground**
(safety manual page 128. Para 314)
- ii) Ans: (c) **Eve's rocking method**
(safety manual page 6)
- iii) Ans: (b) **Dry powder** (code of Technical instruction page No.341) 10.03
- iv) Ans: (c) **110KV supply** (supply code 3(1)d page -3)
- v) Ans: (b) **Buchholz relay** (code of Technical instruction page No.103)
- vi) Ans: (c) **15 year's** (Part II consumer grievance reprisal form para (4)
- vii) Ans: (c) **Section : 56** (supply code)
- viii) Ans: (a) **Misuse of Energy** (Supply code)
- ix) Ans: (a) **5X5 m** (Distribution code section -29)
- x) Ans: (a) **EMD** (Distribution code chapter - 7)
- xi) Ans: (d) **LT supply** (section -25)
- xii) Ans: (d) **90 days** (DSOP page -23)
- xiii) Ans: (c) **7 days** (DSOP page -50)
- xiv) Ans: (c) **3 Lakhs** (Delegation of power item No. 21)
- xv) Ans: (c) **No objection certificate** (Distribution code
Notification No .TNERC /DC/8-21 dt:07.10.2014)
- xvi) Ans: (c) **Single tender** (Tender regulation page 13 Regulation -8)
- xvii) Ans: (a) **EE/Operation** (EA -2013 section 176)
- xviii) Ans: (a) **50 Lakhs** (delegating of power item No.18)
- xix) Ans: (b) **Harmonic suppression unit** (supply code chapter 2 (4) (iv)
additional charge for harmonics duping .)
- xx) Ans: (c) Fixed charge Rs. = 1380 /-
Actual Unit Charges (250unit X Rs.12/unit) = 3000
5% E Tax = 219
Total CC Charges **Rs. = 4599.00/-**

Ans: 2 (a)

WORKING SHEET FOR ENERGY THEFT CASE(Direct hook)

Modus Operandi	: Direct Hook
Connected load (CL)	: 0.335
Load Factor (LF)	: 0.3
Diversity Factor (DF)	: 1.0
Working Hours (WH)	: 12
Period No.of days (p)	: 365
Computed consumption (C)	: $\frac{CL \times LF \times WH \times p}{DF} = \text{units } \frac{0.335 \times 0.3 \times 12 \times 365}{1.0} = 440 \text{ units}$
2 x C x max unit rate in Rs. (domestic purpose)	= 2 X 440 X 6.60 = 5808
Cost of Energy Stolen	: 5808/-
E.Tax	: ---
Total	: Rs.5808/-
Extra Levy A/C 61 -710	: Rs.5808.00/-
Compounding amount (If the party desires) A/C 61 -730	: Rs.1000.00/-

TAMILNADU ELECTRICITY SUPPLY CODE

Amendments updated up to 28.02.2013

Form 8

ANS: a [b]

[See Regulation 23 (AA) (7)]

Formula to assess the quantum of energy in case of theft of electricity

The following factors are to be considered to arrive at a formula for the assessment of quantum of energy in case of theft of electricity.

- (i) Nature of Service
- (ii) Connected load / Contracted demand
- (iii) Load factor
- (iv) Nature of feeder (Rural / Urban / Industrial) and supply restrictions in the feeder

(v) Per day usage hours for which assessment has to be made.

The authorized officer may take into account the following and arrive at the least period (duration) of theft:

- i. for the period of twelve months
- ii. for the period from the date of prior inspection if any by the Enforcement or meter testing wing to the date of detection
- iii. from the date of service connection to the date of detection
- iv. wherever electronic meters are installed and the load curves are studied periodically the period of theft could be limited to the exact period as could be determined scientifically.
- v. Based on the document produced by the accused person.
- vi. For any other reasonable period as assessed by the authorized officer to the best of his judgment

$$U = L \times LF \times H \times D$$

DF

Where

U = Quantum of energy Assessed in Units

L = Load / demand in KW

LF = Load factor

H = Number of hours the load is considered to be used in a day.

D = Duration of assessment in days

DF = Diversity Factor

The following tables give the Load Factor, and the Number of hours per day usage for different categories of usage of the pilfered Energy.

(A)

TAMILNADU ELECTRICITY SUPPLY CODE
Amendments updated up to 28.02.2013

ANS: 2[C] "Form 8-A
[(See proviso of clause 23 (AA)(7)]

FORMULA TO ASSESS THE QUANTUM OF MISUSED ENERGY IN THE CASE WHOEVER DISHONESTLY USES ELECTRICITY FOR THE PURPOSE OTHER THAN FOR WHICH THE USAGE OF ELECTRICITY WAS AUTHORIZED AS REFERRED IN SECTION 135 (1)(e) OF THE ELECTRICITY ACT 2003

(i) Quantum of misused energy, $U = a \times (b / c)$ kWh
where

- a - Total consumption recorded during the preceding period of existence of such violations limited to a specified period
- b - misused load found at the time of inspection
- c - total connected load found at the time of inspection

(ii) Penal charges on account of unauthorized use of energy

$$= (2 \times U \times d) - (U \times e)$$

where

- U - Quantum of misused energy, kWh
- d - Tariff of unauthorized use
- e - Tariff of authorized use

(iii) Period of unauthorized use

The authorized officer may take into account the following and arrive at the least period (duration) of unauthorized use of electricity:

- (a) for the period of twelve months
- (b) for the period from the date of prior inspection if any by the licensee's officer to the date of detection
- (c) from the date of service connection to the date of detection
- (d) wherever electronic meters are installed and the load curves are studied periodically, the period of unauthorized use of electricity could be limited to the exact period as could be determined scientifically.
- (e) Based on the valid document produced by the accused person.
- (f) For any other reasonable period as assessed by the authorized officer to the best of his judgment"

Notification No. TNERC/SC/7-27 dated 27.05.2011 w.e. from 15.06.2011)

Ans:2(d)

WORKING SHEET FOR ENERGY THEFT CASE (Misuse of Energy)

Total consumption recorded during the preceding period (a) : in 2555 Units

Misused load (b) : 0.150 in KW

Total connected load (c) : 0.750 in KW

Period No.of days (p) : 365 in days

Quantum of misused energy (Units) : $a \times \frac{b}{c}$ units $2555 \times \frac{0.150}{0.750}$

Penal charges on account of unauthorized energy U : 511 units

$(2xUxd) - (Uxe) = (2x511x8.05) - (511x1) = 8222 - 511$

Where d= tariff of unauthorized use
(Maximum unit rate for commercial purpose Rs.8.05 per unit)

e= tariff of authorized use
(Minimum Rate Rs.1/unit)

Cost of Energy Stolen : Rs. 7716

5% E-TAX (Ux8.05x0.05) : Rs. 206
(Actual consumed misused energy Rate)

Total : Rs. 7922

Extra Levy A/C 61 - 710

: Rs.7922

Compounding A/C 61 - 730

: Rs.2000

ANSWER

3 [a]

34. EARNEST MONEY DEPOSIT :

- (1) The applicants required to pay Earnest Money Deposit will be asked to pay Earnest Money Deposit along with registration fee for registration of application.
- (2) This Earnest Money Deposit will be adjusted against the quantum of initial Security Deposit payable by the applicant before availing supply and balance amount if any shall be collected.
- (3) In respect of High Tension applicant the Earnest Money Deposit payable will be equal to the quantum of initial Security Deposit.
- (4) If the applicant backs out after registration and payment of E.M.D. but before payment of Development charges, Service Connection charges and Meter Caution Deposit, then the application shall be cancelled and E.M.D. forfeited.
- (5) If the applicant backs out after payment of all charges and execution of agreement, the application shall be cancelled and agreement terminated forfeiting all amount remitted except meter caution deposit in the case of both High Tension and Low Tension.
- (6) If the H.T. applicant who prefers to back out partially against the sanctioned demand before availing supply, then the above forfeiture rule may be applied proportionate to the demand backed out.
- (7) The Earnest Money Deposit paid does not bear any interest until the date of service connection.

35. SECURITY DEPOSIT:

- (1) All applicants for supply of electricity shall pay initial Security Deposit, before availing of the supply, in Cash / Cheque / Demand draft at the rate fixed by the Commission from time to time.
- (2) The following categories of service connections may be exempted from payment of Security Deposit :
 - i) Service connections in the name of the State Government Departments
 - ii) Service connections to premises occupied by Foreign Diplomats or Consulate Establishments, irrespective of whether the service connection is in their name or not.
- (3) Applicants for supply of electricity for agricultural and hut service connections shall pay Security Deposit equivalent to seven months levy of lump sum charges / metered energy charges or the amount notified by the Commission from time to time.
- (4) Interest will be paid by the Licensee on Security Deposit at the rate as may be fixed by the Commission from time to time. Full calendar months only will be taken into account for the purpose of calculating the interest and the interest will be calculated to the nearest rupee i.e. 50 paise or above will be rounded off to the next higher rupee and less than 50 paise will be ignored.
- (5) If the consumer is prepared to take supply through pre payment meter such consumer is not required to pay security deposit.

AMENDMENT TO THE TAMIL NADU ELECTRICITY SUPPLY CODE**(1) In sub - regulation (6), for clause (1) the following clause shall be substituted namely:-**

(1) The cost of shifting service line, structure and equipments shall be borne by the consumer. The consumer shall pay the estimated cost of shifting in advance in full. The copy of the estimate shall be given to the consumer. The shifting work will be taken up only after the payment is made. The estimate will cover the following.

- (i) Materials dismantled in the old site and reusable shall be used in the new site as far as possible.
- (ii) 10% of the present value of the dismantled and reusable materials towards charges for dismantling and charges for loading, unloading transport to the new site/store,
- (iii) Cost of the new materials required for the shifting work.
- (iv) Add 5% of the cost of new materials towards loading. Unloading and transport to new site.
- (v) Add 10% of the present value of all the materials to be erected in the new site towards erection charges.
- (vi) 5% of the present value of retrievable scrap materials towards transport charges.
- (vii) Due credit shall be given to the consumer applicant as below but however limited to the total estimated cost of new work.
 - (a) Book value /written down value subject to a minimum of 20 % of the cost of retrievable and reusable materials but not used in the new site.
 - (b) Scrap value on the retrievable but not reusable materials at not less than 10 % of its original value.
- (Viii) After completion of the work. A Revised estimate shall be prepared with a copy to the consumer based on the actual cost of materials, loading, unloading, transport and erection charges. If the original estimate cost is more than the revised estimate, the balance shall be refunded to the applicant / consumer within 3 months. If the original estimate cost is less than the revised estimate, the difference shall be collected from the applicant /consumer.

ANS: 3 [C] Distribution Code

✓ 39. TEMPORARY SUPPLY:

Temporary supply of electricity to any premises will be considered by the Licensee on special terms and conditions as below:—
(1) The Licensee shall extend temporary supply on application from intending consumer with required [charges] and on receipt of deposit.

(2) The deposit for temporary supply shall be calculated as below:

Total value of materials to be used on the extension and Service connection	A
Less: Value of meters / meter board / out out	B
Net value of materials to be recovered from the consumer	A - B
Add: Labour charges to be incurred	C
Add: Overhead 15% on A - B + C	D
Probable consumption charges	
Advance current consumption (CC) charges	E
Total deposit to be obtained	F
	(A - B + C + D + E)

(3) On completion of temporary supply works, the following charges shall be adjusted against the deposit.

1. 10% cost of the retrieved materials
2. 10% cost of meter devoluted
3. 100% cost of materials not retrieved
4. original erection charges, dismantling charges and transport charges
5. Overhead at 15% on the total cost of materials plus labour charges (including cost of meter)

(4) The Licensee shall refund the balance deposit if any after the temporary supply period is over within a period to be specified by the Commission.

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ANS: 3(d) DISHBAHIN CODE
TNERC NOTIFICATION dt 7-10-2014

- (5) after sub-regulation (15), the following sub-regulation shall be inserted, namely:-
- “(15A) Notwithstanding anything contained in sub-regulations (14) and (15), a person or an establishment or an entity shall be given only one service connection in a premises or in contiguous premises to run a business or service or occupation or another form of activity including its associated activities and for activities of the associates even if there is a permanent physical segregation.”

ANS : 4[a]
Code of Tech. Instruction

13.07 Earthing of Distribution lines

13.07.01 H.T. Line.

i) *Lines carried on Metal poles.*

Every fifth pole and all supports provided with mass or block concrete foundation shall be earthed.

ii) *Lines carried on RCC & PSC Poles.*

The metal cross arm and the insulator pins should be bound together and earthed at every pole.

13.07.02 L.T. Lines with Multiple Earthed Neutral

i) *Lines carried on Metal Poles.*

Every fifth pole and all supports provided with mass or block concrete foundation shall be earthed.

ii) *Lines carried on RCC and PSC Poles.*

The metal cross arm and the insulator pins shall be bound together and earthed at every fifth support.

Note: When the cross arm is of RCC, the insulator pins should be bound together and earthed.

13.07.03 All special structures carrying switches, transformers, fuses etc. shall be earthed.

The lightning arrester earth shall have an earth connection to the body of the transformer tank.

13.07.04 The supports on either side of the road, railway, a river crossing span shall be earthed.

13.07.05 All supports (Metal, Wood or RCC) of both LT and HT line running through inhabited location and along such other places where earthing of all poles is considered desirable by the field staff on safety considerations shall be earthed.

13.07.06 It is imperative that the earthing provided shall be good and maintained with as low a resistance as possible as otherwise the earthing is of no value.

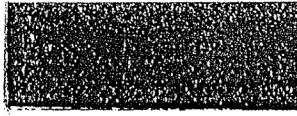
13.07.07 Whenever transmission or distribution lines pass close to a well or a permanently moist place, an earth shall be provided in the well or the marshy place and connected to the transmission or distribution line support.

ANS: 4 [b] Code of Tech Instruction

18.11.05 Earthing at Distribution transformer station

Distribution transformers should be provided with 3 separate pipe earths. Transformer tank, AB switch down-rod, transformer secondary Neutral and structure should be connected by means of 2 separate earth leads - L&S should be connected separately to the third earth pit which should be interconnected to the other two earths. The LA earth lead should be connected to the transformer body earth also.

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10.09 Types of Fire Extinguishers

(12)

10.031 The types of fire extinguishers and their suitability for various classes of fires are listed below:

S.N.	Type of Extinguishers	Suitability
1.	Soda Acid	Suitable for fires involving combustible materials of organic nature such as wood, paper, rubber etc. only. <i>These extinguishers should not be used on fires involving FLAMMABLE liquids and energised electrical equipments; also unsuitable for fires involving flammable gases and combustible metals.</i>
2.	Chemical FOAM	Best suited to put out fires involving combustible materials of organic nature and flammable liquids like transformer oil. <i>They are not suitable for fires involving flammable gases under pressure and combustible metals which are reactive to water and water containing agents. Foams are electrically conductive and therefore are not recommended for use on electrical fires.</i>
3.	Dry Powder	This type of extinguisher is suitable for fire involving flammable liquids and flammable gases under pressure and also best suited for fires in electrical equipments. <i>They are unsuitable for fires involving combustible materials of organic nature like paper, rubber etc. and also for fires involving combustible metals.</i>

[P.T.O.]

(13)

S.No.	Type of Extinguishers	Suitability
4.	Carbon-dioxide	-do- it is ideally suited for electrical fires indoor equipments and not so effective in open air usage.
5.	Fire Buckets Water (in a round bottom bucket of 10 litre capacity)	This method of fire extinguishing can be used when the cooling effect of water is essential for extinction of fires. (e.g.) fires involving paper, plastics etc. It is unsuitable for tackling liquid and gas fires and the fires in electrical equipments.
6.	Sand (in round bottom bucket of 10 litre capacity)	Sand can be used to extinguish fires where a blanketing effect is essential (e.g.) fires involving combustible materials of organic nature like wood, paper etc. and flammable liquids.

Note:

- (1) When an energised electrical equipment is involved in a fire, the non-conductivity of the extinguishing media is of utmost importance and only dry powder or carbon-dioxide type fire extinguishers (without metal-horn) alone should be used. Upon de-energisation of the equipment, other types of extinguishers can be used. Water expelling type extinguishers like soda acid and foam type extinguishers should not be used on fires involving live electrical equipments under any circumstances.
- (2) Use of Chemical foam is not desirable for fires involving alcohols and other water miscible flammable liquids. Dry powder type extinguishers should be used for dealing with such fires.
- (3) Where cleanliness and contamination of sensitive electrical equipment are of importance, only carbon-dioxide type should be used

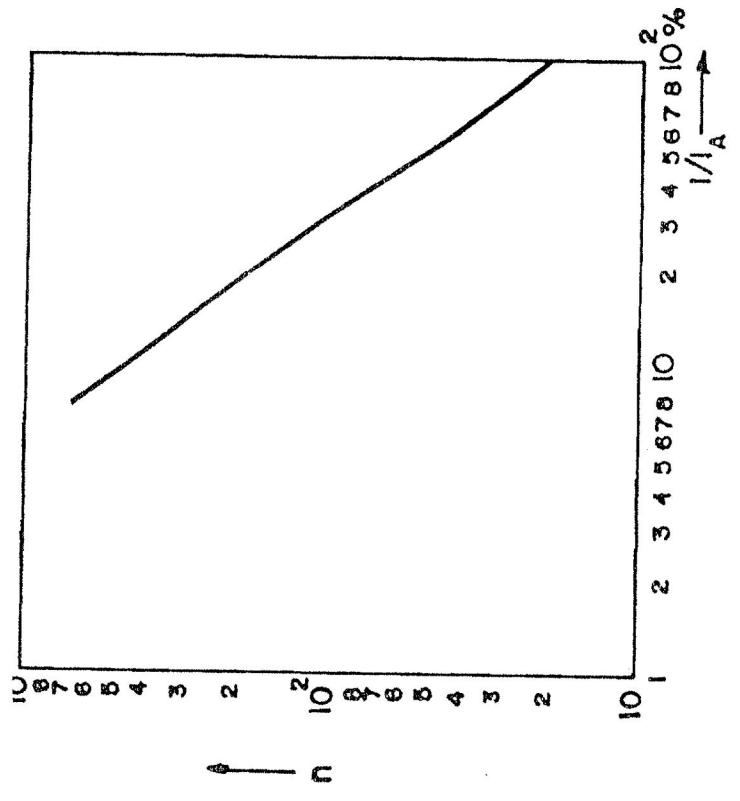
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ANS : 4[d] Code of Tech. Instruction

4.10 Vacuum Circuit Breaker (VCBs)

The main advantages of vacuum breakers are the virtual elimination of maintenance, flammable liquid and venting, reductions in unit sizes and weight and

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- n = Number of Interruptions
- I = Interrupted current
- I_A = Rated short circuit current

Fig 4.1. Permissible stressing of the contact system as function of the interrupted short-circuit breaking current.

4.10

interruption times fast enough to beat h.r.c. fuses. Only parts subject to normal wear and ageing need be serviced to ensure fully reliable operation. The intervals at which these maintenance should be carried out and amount of work involved depends upon the number of short circuit interruption switching frequency and actual service condition.

The service intervals indicated below are only approximate and should be adjusted to suit the particular operating conditions. Under normal conditions, the vacuum interrupters need not be serviced. The maximum permissible contact wear is 3 mm.

4.10.01 Inspection Schedule

Once a year, a general inspection should be carried out and if necessary the insulating parts should be cleaned with rag. More frequent checks may be necessary if the breakers are installed in a dust laden atmosphere.

4.10.02 Breaker operating mechanism

The operating mechanism should be oiled and lubricated every 10 years or after 10,000 operations whichever is earlier.

4.10.03 Vacuum interrupters

Replacing the interrupter is an exception. They may have to be replaced after 30,000 mechanical operations or when contacts have eroded by maximum amount and white 'dot' marked (or coloured mark on burn off indicator in some makes) on moving contact stem of the vacuum interrupter is not visible in breaker closed condition. Use of contact burn off calipers is recommended in certain makes. For guide the following number of operations are given for life of interrupters of certain makes. Manufacturer's instructions on particular makes may be used.

For a 36 KV, 1250A, 25 KA-VCB	For a 12 KV - 630A - 16KA-VCB	
25 KA - 50	Normal load -	20,000
16 KA - 90	2.5 KA -	3,000
12.5 KA - 225	8.0 KA -	400
1250 A - 20000	16 KA -	100
Normal Current - 30000		

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4.10.04 Important

Before starting any work on breaker, isolate, short circuit and earth, Disconnect the auxiliary supply. Open and close the breaker by hand until both closing and tripping springs are discharged.

Inspections and repairs should be carried out by qualified fitters who are familiar with switchgear of this type with due reference to operating instruction.

Only those lubricants, grease and corrosion protection agents recommended by the manufacturer shall be used.

4.10.05 Contact resistance

Check the contact resistance across the top and bottom pole supports after closing the vacuum interrupter through quick release of closing spring. The contact resistance should be around 15 to 20 micro ohms. This test is recommended as a bench mark while installing the new interrupter. Experience has shown that a degree of spread can be obtained in contact resistance measurements when the circuit breaker is closed, but these do not have the same degree of significance as in other types of circuit breakers. The results show that there is a tendency for the resistance to decrease as the switch is used. Any increase in the resistance figure does not indicate contact erosion as in most breakers and the fact that the contacts are in vacuum precludes the forms of deterioration which would take place in other media.

4.10.06 Check on Vacuum

In respect of preservation of the vacuum, the vacuum interrupters feature high reliability. Consequently, checking the vacuum is not included in the maintenance schedule. Checking is advised only in the following cases:-

- i) When it is suspected that the interrupter was damaged externally during transport or installation and
- ii) after the switchgear has been installed twenty years. Some manufacturers specify a routine maintenance check around once in 4 years, by one of the following methods:
 - (a) By mechanically pulling down the moving contact stem of the interrupter. If it moves freely it would indicate that the interrupter is full of air and hence lost vacuum,
 - (b) H.V. test The high voltage test may be undertaken according to manufacturer's instructions.

4.10.07. Warning

- 1) On conclusion of this H.V. test, bear in mind that the sections of the vacuum interrupter may have been capacitively charged. Established an earth before touching it.
- 2) Do not exceed the test voltage ratings because inadmissible high X-ray intensities could arise particularly at High d.c. voltages.

4.10.08 Inspection schedule of VCBs

Six months after commissioning and thereafter once a year	General inspection; check tightening of bolts. Clean insulating parts with non-fluffy cloth. Check the mechanism stroke settings. More frequent inspection may be necessary if the breakers are installed on a dust laden atmosphere.
Every 10 years or 10,000 operations	Lubricate operating mechanism with approved lubricants. Ensure the coil fixing screws are fully tight and locked by lock-tight fluid.
After 30,000 mechanical operations or when contacts have eroded a maximum amount.	Replace vacuum interrupter as per manufacturer's instructions.

NOTE: It may be necessary in certain cases to equip the VCBs with surge absorbers to take care of current chopping effects.

4.10.09 Check points for periodical inspection of VCBS

Sl. No.	Check point	Check Item	Check Method	Criteria	What to do	Remarks
1.	Entire Circuit Breaker	Tightness of bolts and nuts	By tightening them with screw driver and spanners	There should not be any fastener loosely tightened	Tighten the loose fasteners properly	
		Dust and foreign matter	Visual check	The breaker should be clean and there should be no foreign matter.	Clean by compressed air flow. Also wipe the accessible components with a clean dry cloth.	
		Deformation, excessive wear and damage	Visual check	There should be no excessive wear or damage or deformation.	Remove cause and replace parts.	
		Lost or missing parts	Visual check	There should be no missing parts	Reinstate the missing parts to normal condition.	

மேல்நிலை மின்பாறைகளும் புதைவடங்களும் 71

ANS: 5 (a) Safety Manual

இ. புதை மின்வடங்களில் (Underground Cables)

வேலைசெய்தல்

புதை மின்வடங்களுக்கு அதிகப்படியான முற்காப்புகள்

1. புதை மின்வடங்கள் இடுதல் (laying) முதலிய வேலைகள் செய்யும் ஆட்களும், மின்வட இணைப்போர்களும் (cablejoints) மேற்கூறிய விதிகளை அனுசரிப்பதோடு, சீழ்க்கண்ட விதிகளையும் கட்டாயமாகப் பின்பற்றவேண்டும்.

மின் அகற்றல்

2. உயர் மின்னழுத்தப் புதைவடங்களில் வேலைசெய்வதற்கு முன், அவற்றின் எல்லாக் கடத்திகளிலுமுள்ள மின்னை அகற்றல் (discharge) வேண்டும். நில இணைப்புத் திறப்பான்கள் (earthing switches) இருப்பின், அவற்றைப் பூட்டிவைத்தல் வேண்டும்.

மின் இயக்கமுள்ள தாழ் மின்னழுத்தப் பாறைகளில் வேலைசெய்யவோர்

3. மின் இயக்கமுள்ள தாழ் மின்னழுத்தப் பாறைகளிலும் சாதனங்களிலும் இணைத்தல் (jointing), பழுதுபார்த்தல் முதலான ஆக்க அல்லது பேணுதல் வேலைகளைத் தகுதிவாய்ந்த அதிகாரம் பெற்றவர்தாம் செய்தல் வேண்டும்.

தகுந்த ஆடை

4. புதை மின்வடங்களில் வேலைசெய்யும் இணைப்போர்களும் (cable jointers), மற்ற வேலையாட்களும் தகுந்த ஆடைகளை அணிதல் வேண்டும். மின் இயக்கமுள்ள வடங்களிலோ அல்லது அவற்றின் அருகிலோ வேலைசெய்வதானால், சட்டையின் கைகளை (sleeves) கீழே தாழ்த்தி வைத்திருத்தல் வேண்டும். மோதிரங்கள், கடிக்காரம் அல்லது சாவிச் சங்கிலிகள், ஆணி அறையப்பட்ட மிதியடிகள், உலோகப் பித்தான்கள்கொண்ட மேற்சட்டைகள் (coats) அல்லது குல்லாய்கள், உலோக வார்ப்பூட்டுகள் (buckles) ஆகிய தேவையல்ல உலோகப் பொருள்களையும் தீப்பற்றக்கூடிய பொருள்களையும் அணிதல் கூடாது.

அபாயப் பலகை வைத்தல்

5. மனிதத் துளைகளின் (man holes) அல்லது கைத்துளைகளின் (hand holes) மூடிகளை எடுக்கும்போதும், குழிகளைத் தோண்டும் போதும் துளையையோ அல்லது குழியையோ ஒரு தடுப்பு (barrier)

அமைத்துப் பாதுகாத்தல் வேண்டும் அல்லது குறுங்கால மூடி (temporary cover) கொண்டு மூடவேண்டும். அவற்றை நிரந்தரமாக மூடும்வரை நடமாடும் ஜனங்களுக்கு நன்றாகத் தெரியும்படி அபாயக் குறிகளையோ அல்லது சிவப்பு விளக்கையோ வைக்க வேண்டும்.

அகழிகளுக்குப் பலகை அமைத்தல்

6. உறுதியற்ற நிலத்திலுள்ள வட அகழிகளுக்கு (cable trenches) பலகை கொடுத்தல் (rimbering) வேண்டும்.

விஷவாயுக்கள் உள்ள அகழிகள்

7. குழிகளில் அல்லது மனிதத் துளைகளில் விஷவாயுக்கள் இருக்கக்கூடும் எனச் சந்தேகப்பட்டால், அவற்றினுள் செல்லக் கூடாது.

திறந்த சுவாலைகளை நிலக்கல்

8. மனிதத் துளைகளில் புகைபிடித்தல் கூடாது. கூடுமான வரை அவற்றினுள்ளும் அருகிலும் திறந்த சுவாலைகளை எடுத்துச் செல்லக்கூடாது. மின் இயக்கமுள்ள பாகங்களை அல்லது வட உறைகளைக் (cable sheaths) கையாளும்போது, மின்பொறிகள் (sparks) உண்டாவதைத் தடுக்கவேண்டும்; உலோகங்களைப் பற்ற வைக்கும்போதும் (soldering), இணைப்புகளைத் (joints) துடைக்கும் போதும் (wiping) பற்றுக்கலவை (flux) எரிவதைத் தவிர்க்க வேண்டும்.

வடங்களை இழுத்தல்

9. வடங்களை இழுக்கும்போது பற்சக்கரம் நழுவி வேலையாட்களுக்குத் தீங்கு விளையாமல் பார்த்துக்கொள்ள வேண்டும். இழுக்கும் கம்பி (pulling line) இழுக்கும் சாதனத்துள் கைகளைச் செலுத்தி அபாயம் விளைவிப்பதைத் தவிர்க்க வேண்டும்.

அடையாளமில்லாத வடங்கள்

10. குறிகளாலோ அல்லது கிடக்கும் நிலைகளாலோ மின் வடங்களில் ஒவ்வொன்றும் இன்ன வடம் என்று சொல்ல (identify) முடியவில்லை எனில், அவற்றில் வேலைசெய்யக்கூடாது.

வடங்களைப் பரிசோதித்தல்

11. வட உறைகளை வெட்டுவதற்கு முன், கூடுமானால் சாதனங்களைக்கொண்டு, வடக் கடத்திகளில் மின்இயக்கம் உள்ளதா என உறுதிப்படுத்திக்கொள்ள வேண்டும்.

பாதுகாப்புச் சாதனங்களையும் விசேடக் கருவிகளையும் . . . 73

எரியிழைகளை மறுபடியும் பொருத்துதல்

12. ஒரு மின் விநியோகத் தம்பத்திலோ (distribution pillar) அல்லது வேரோர் இடத்திலோ உள்ள மிக்க சக்திவாய்ந்த (high capacity) தாழ் மின்னழுத்த எரியிழைகளைப் புதுப்பித்து, பிறகு அவற்றை மறுபடியும் சுற்றுகளில் பொருத்தும்போது, அச் சுற்றுகளில் மின் இயக்கமில்லாமல் செய்யவேண்டும்; மின் இயக்கத் தோடு எரியிழைகளைப் பொருத்துதல் கூடாது.

6. மின் அதிர்ச்சிக்குச் சிகிச்சையும் முதலுதவியும் (Shock Treatment and First Aid)

மின் அதிர்ச்சி விபத்துகள்

1. விபத்துகள் மின் அதிர்ச்சியால் (electric shock) ஏற்பட்டன எனச் சந்தேகம் இருப்பின், பின்வரும் முறையை மேற்கொள் :

(அ) எவ்வளவு விரைவில் மின் இயக்கமில்லாதபடி செய்ய முடியுமோ அவ்வளவு விரைவில் செய். இதைச் செய்ய அதிக நேரமாகும் எனில், விபத்துக்குட்பட்டவரை அப்புறப்படுத்து.

(ஆ) மர நாற்காலி, ரப்பர்ப் பாய், தென்னைநார்ப் பாய் போன்ற உலர்ந்த கடத்தாப் பொருளின்மேல் நின்றுகொண்டு, உலர்ந்த தோல், கயிறு, துணி, காகிதம் அல்லது மற்றக் கடத்தாப் பொருளைக்கொண்டு, மின் இயங்கும் பாகத்திலிருந்து விபத்துக்குட்பட்டவரைப் பிரி. பிரிப்பதற்கு எக் காரணங்கொண்டும் வெறுங் கைகளை உபயோகித்தல் கூடாது.

(இ) விபத்து உயர்மின் அழுத்தப் பாதகனில் அல்லது சாதனங்களில் ஏற்பட்டிருந்தால், தனிப்பட்ட கவனத்தைச் செலுத்துதல் வேண்டும்.

(ஈ) மிகவும் அருகிலுள்ள மருத்துவருக்கு (doctor) ஆள் அனுப்பு. மின் நிலையத்துக்கு அருகிலுள்ள மருத்துவர்களது பெயர், முகவரி, தொலைபேசி எண் ஆகியவற்றையும், எளிதில் எய்தக்கூடிய மருத்துவமனைகளின் (hospitals) பெயர், இருக்குமிடம், தொலைபேசி எண் ஆகியவற்றையும் குறித்துவைத்திருத்தல் வேண்டும்.

(உ) பாதிக்கப்பட்டவருக்கு வெளித்தோற்றத்தில் உயிர்ப்பு இல்லை எனில், தாமதியாமல் உடனே செயற்கை உயிர்ப்பு (artificial respiration) அளிக்கத் தொடங்கு. தாமதிக்கும் ஒவ்வொரு விநாடியும் கேடு விளைவிக்கும்.

(ஊ) புகையிலை, செயற்கைப் பற்கள், மெல்லும் சவ்வுப் பண்டம் (chewing gum) போன்ற அந்நியப் பொருள்கள் பாதிக்கப் பட்டவரின் வாயிலோ தொண்டையிலோ இருப்பின், அவற்றைக் கவனத்துடன் அப்புறப்படுத்து.

செயற்கை உயிர்ப்பு முறை

2. செயற்கை உயிர்ப்பு அளிக்க வேறுபட்ட முறைகள் பல உள்ளன. இதுவரை கையாண்ட முறை ஷாஃபெர் (Schaffer)

நிலை 1: விபத்துக்குட்பட்டவரை குப்புறப் படுக்கவை. அவரது உள்ளங்கைகள் ஒன்றின்மேல் ஒன்று பொருந்தும்படி மேற்கைகளை மடித்துவை. பிறகு உள்ளங்கைகளின்மேல் கன்னம் படுப்படி தலையை வை. முழங்கால் மூட்டு ஒன்றால் அல்லது இரண்டாலும் அவர் தலையின் அருகில் மண்டியிடு. அவர் முதுகின் மேல், இரண்டு அக்குள்களையும் சேர்க்கும் வரியைத் தாண்டிச் சிறிது தூரத்தில், விரல்களை வெளியே பரத்தியவாறு கீழ்நோக்கியும், பெருவிரல்கள் ஒன்றோடொன்று தொடும்படியாகவும் இருக்கையையும் வை.

நிலை 2: ஒன்று, இரண்டு, மூன்று என எண்ணி, அவ்வாறு எண்ணும்போது மேற்கைகளை நேராக வைத்தவாறே அவை செங்குத்தாக வரும்வரை முன்பக்கம் சாய். இவ்வாறு விபத்துக்குட்பட்டவரின் முதுகை உறுதியாக அழுத்து. இது மூச்சை வெளிவிடச் செய்யும்.

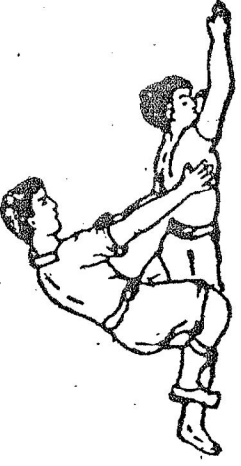
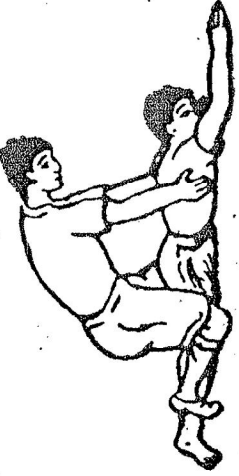
நிலை 3: நான்கு என்று எண்ணிக்கொண்டே பின்சாய்ந்து அழுக்கத்தை விடுவித்து, அவரது மேற்கைகளின் வழியாக உன் கைகளைக் கீழே தள்ளி அவரது மேற்கைகளை முழங்கைகளுக்கு மேலே பற்று. பற்றியவாறே தொடர்ந்து பின்னே சாய்.

நிலை 4: ஐந்து, ஆறு, ஏழு என எண்ணிக்கொண்டே பின்சாயும்போது, அவருடைய மேற்கைகளைத் தூக்கி, அவருடைய தோள்களிலுள்ள இழுப்பை (tension) நீ உணரும்வரை உட்பக்கம் இழு. இது அவருடைய மார்பை விரிவாக்கி மூச்சை உள்ளே இழுக்கச் செய்யும்.

எட்டு என்று எண்ணும்போது, அவரது மேற்கைகளைத் தாழ்த்தி, உன் கைகளை மேலே முதலில் இருந்த நிலைக்குக் கொண்டுவா.

இச்சமுன்றுவரும் செய்கைகளை (cycle) நிமிடத்துக்கு 12 முறை செய். விபத்துக்குட்பட்டவர் மூச்சுவிடத் தொடங்கினால், உன் செயல்முறையை அவர்விடும் மூச்சோடு இசையும்படி (synchronize) செய். அவர் நன்றாக வலிமையுடன் மூச்சுவிடும்வரை செய்யுது, பின்னர் நிறுத்து.

4. இடுப்பைத் தூக்கி முதுகை அழுக்கும் முறை
இடுப்பைத் தூக்கி முதுகை அழுக்கும் முறை (Hip Lift Back Pressure Method): இம் முறை இரண்டாம் படத்தில் விளக்கப் பட்டிருக்கிறது.

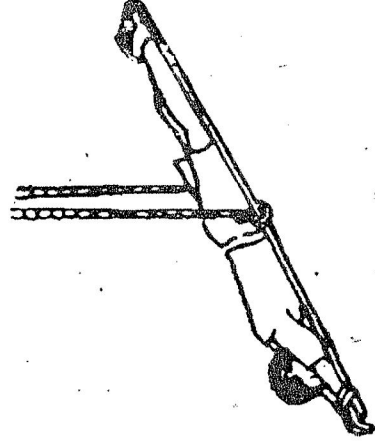
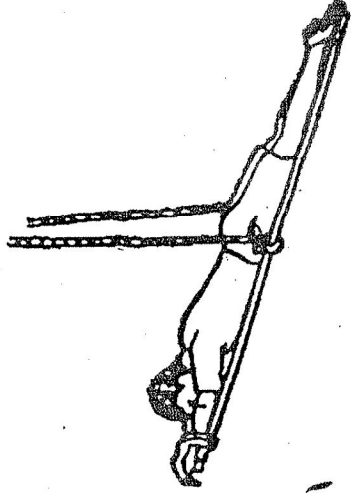


படம் 2. இடுப்பைத் தூக்கி முதுகை அழுக்கும் முறை

முதுகை அழுக்குதல் என்பது விபத்துக்குட்பட்டவரின் முதுகைத் தோள்பட்டைகளுக்கு அடுத்துக் கீழே அழுக்குதல். இதில் விபத்துக்குட்பட்டவரைக் குப்புறக் கிடத்தவேண்டும். அவர் இடுப்பில் கைகளை வைத்து, 4 முதல் 6 அங்குல உயரம்வரை இடுப்பைத் தூக்கி, பிறகு கீழே தரையில் வைக்கவேண்டும். பிறகு முதுகை அழுத்தி நுரையீரல்களிலுள்ள காற்று வெளியேறும்படி செய்யவேண்டும். இம்முறை மிக்க பயன் அளிக்கக்கூடியது. ஆனால், இதற்கு ஒரு பெருங்குறை உண்டு. இதைச் செய்பவருக்கு இது மிக்க களைப்பை உண்டாக்கும். மேலும், பருத்த உடலுடையவர் களுக்கு இதைச் செய்தல் கடினம்.

ஈவின் அசைத்தாட்டும் முறை

5. ஈவின் அசைத்தாட்டும் முறை (Eve's Rocking Method): இம் முறை நான்காம் படத்தில் விளக்கப்பட்டிருக்கிறது.



படம் 4. ஈவின் அசைத்தாட்டும் முறை

மின் அதிர்ச்சிக்குச் சிகிச்சையும் முதலுதவியும்

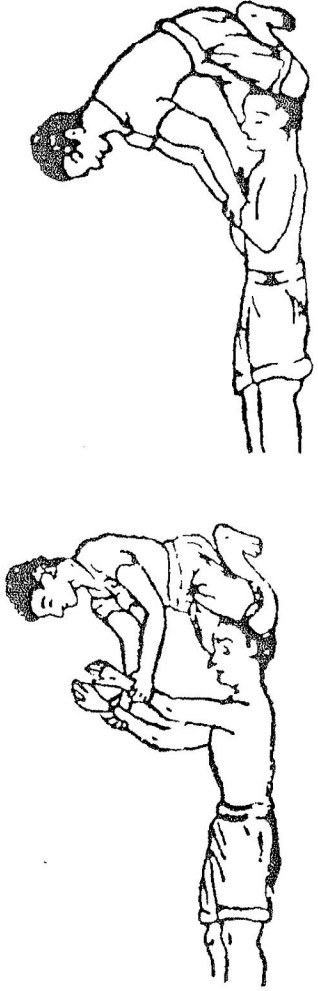
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இம் முறையில் விபத்துக்குட்பட்டவரை ஒரு தூக்கிச் செல்லும் கிடக்கையில் (stretche) குப்புறப் படுக்கவைத்து, அவர் கைகளைக் கிடக்கையின் சட்டத்துடன் (frame) கட்டவேண்டும். பின்னர் அக் கிடக்கையை 45 டிகிரி அளவுக்குக் கீழும் பிறகு 45 டிகிரி மேலுமாகத் தொடர்ந்து அசைத்து ஆட்டவேண்டும். இவ்வாறு அசைத்தாட்டுவதற்குத் தனிப்பட்ட கிடக்கைகள் இல்லாமல் இருக்கலாம். கிடக்கைக்குப் பதிலாக இரு சக்கரங்களையுடைய இலேசான கைவண்டி ஒன்றை இதற்கு உபயோகிக்கலாம். இம் முறை முயலத்தக்கது. இதைக் குழந்தைகளுக்கு மிகவும் எளிதாகக் கையாளலாம். இயக்குபவர் குழந்தையைத் தன் கைகளில் பிடித்தபடி நின்றுகொண்டு அசைத்தாட்டலாம். இம்மாதிரி அசைத்தாட்டுவது உடலிலும் மூளையிலும் இரத்தத்தைச் சுற்றும்படி செய்து (circulate), உயிர்ப்பு விரைவில் வரச்செய்யும் என்று வற்புறுத்தப்படுகிறது.

6. கைகளைத் தூக்கி மார்பை அழுத்தும் முறை

மேற்கைகளைத் தூக்கி மார்பை அழுக்கும் சில்வெஸ்டர் முறை (Arm Lift Chest Pressure Silvester Method):

இம் முறை மூன்றாம் படத்தில் விளக்கப்பட்டிருக்கிறது.



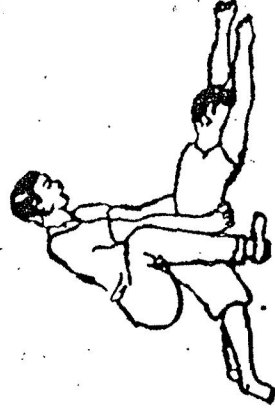
படம் 3. மேற்கைகளைத் தூக்கி மார்பை அழுக்கும் முறை (சில்வெஸ்டர் முறை)

விபத்துக்குட்பட்டவரை முதுகின்மேல் மல்லாத்திப் படுக்க வைக்கவேண்டும். அவரது கைகளை மணிக்கட்டுக்கு மேலே பிடித்து, முதலில் மேலே தூக்கி, பிறகு தரையில் படும்வரை தலைக்கு மேலே தூக்கவேண்டும். பின்பு கைகளை மார்புக்குக் கொண்டுவிந்து கீழ்நோக்கி அழுக்கவேண்டும். இம் முறையில் ஒரு முக்கியமான குறை உண்டு. எலும்பு ஒன்றும் இல்லாமல் ஒரு தசைப்பொருளாய் இருக்கும் நாக்கு, உயிர்ப்பு நின்றதும், தன் வலிமை கெட்டு, பின்பக்கம் வீழுந்து, காற்றுக்குழாயை அடைத்து,

நாற்றுக்கு ஐம்பது நிகழ்ச்சிகளில் மூச்சடைக்கச் செய்யும் ஆதலால், மற்றொருவர் விபத்துக்குட்பட்டவர் நாக்கை வெளியே இழுத்துப் பிடித்துக்கொள்ள வேண்டும். ஆனால், சில சமயங்களில் இதைச் செய்ய ஒருவரும் கிடைக்காமற் போகலாம். (தோள் களுக்கு அடியில் ஒரு கனத்த திண்டை வைத்து, தலை கீழே தொங்கும்படி வைத்தால், நாக்கு காற்றுக் குழாயைத் தடுப்பதில்லை எனத் தோன்றுகிறது). மற்றபடி இஃது ஒரு நல்ல முறை.

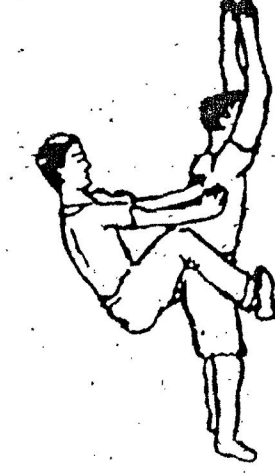
7. ஷா:பெர் முறை அல்லது குப்புறக் கிடத்தி அழுக்கும் முறை
(Schaffer Method or Prone Pressure Method):

இம் முறை ஐந்தாம் படத்தில் விளக்கப்பட்டிருக்கிறது.



நிலை 1

மூச்சை வெளியேற்ற அழுக்கும் நிலை



நிலை 2

மூச்சை உள்ளிழுக்க அழுக்கத்தை நீக்கும் நிலை

படம் 5. ஷா:பெர் முறை

முதல் இயக்கம்: மூச்சை வெளியேற்றுதல் (முதற் படத்தைக் கவனி). விபத்துக்கு உட்பட்டவருக்கு இருபுறமும் முழங்காலை வைத்து மண்டியிடு. அவருடைய முதுகில் உன் கைகளைத் தட்டையாக இரு பெருவிரல்களும் ஒன்றை ஒன்று தொடுவது போன்று வைத்து, இருபக்கமும் கீழ் உள்ள விலா எலும்புகளின் மேல் படும்படி விரல்களை விரித்து, முதற் படத்திற் கண்டபடி வை. பின்னும் முதற் படத்தையே தொடர்ந்து பின்பற்றிக் கீழேநாக்கி அழுத்திக்கொண்டே, உறுதியாகவும் மென்மையுடனும் விபத்துக்குட்பட்டவர்மேல் முன்புறமாகச் சாய்.

இரண்டாம் இயக்கம்: மூச்சை உள்ளிழுத்தல் (இரண்டாம் படத்தைக் கவனி). உன் கைகளை எடுக்காமலே, மென்மையுடன் பின்புறமாகச் சாய். மறுபடியும் மூச்சை வெளியேற்ற அழுக்கு வதற்கு உன் கைகள் அந் நிலையிலேயே இருக்கவேண்டும். இந்த இரண்டு இயக்கங்களையும் தொடர்ந்து செய்.

மின் அதிர்ச்சிக்குச் சிகிச்சையும் முதலுதவியும்

ஒரு நிமிடத்துக்குச் சுமார் 15 முறை இவ்வாறு இவ்விரண்டு இயக்கங்களையும் செய். இதன் குறிக்கோள் விபத்துக்குட்பட்டவரின் நுரையீரல்களை விரியவும் சுருங்கவும் செய்து, இயற்கையாக மூச்சு விடும் வழியைப் பின்பற்றுவதே. இயக்குபவரும் தாம் அழுக்கி முன்னே சாரும்போது தம் மூச்சை வெளியே விட்டும் பின்னே சாரும்போது தம் மூச்சை உள்ளிழுத்தும் வந்தால், சுபாவமாக மூச்சுவிடும் காலஅளவை அடையமுடியும். மேலும், தம்முடைய இயக்கச் செயல்களின் காரணங்களையும் அறியமுடியும்.

இயற்கை உயிர்ப்பு வரும்வரை இவ்வியக்கங்களை நிறுத்தாதே. பயன்பெற, ஒரு மணி நேரம் அல்லது அதற்கு மேலும் செய்யலாம்.

13-03.02 Clearance to Buildings

A. Medium and low voltage lines and service lines:

Power lines should not be taken over buildings as far as possible and every effort should be made to divert the line away for all buildings. Where, however, buildings cannot be avoided, the minimum clearances specified in Rule 79 of I.E.Rules 1956 extracted below shall be maintained.

"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)."

"2. Any conductor so situated as to have a clearance less than that specified above, shall be adequately insulated and shall be attached by means of metal clips at suitable intervals to have earthed bearer wire having a breaking strength of not less than 317.5 Kg (700 lbs)

"3. The horizontal clearance shall be measured when the line is at a maximum deflection for the vertical due to wind pressure."

B. Clearances for Building of H.V. lines.

1. Where a H.V. overhead line upto and including 33KV 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 clearance 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 11KV and upto and including 33KV = 6 feet (1.85m)

C. Clearance between lines of different or same voltage on independent supports.

If lines of different voltages or same voltages carried on independent supports, the supports should be so located that the clearance between the lines is not less than the height of the taller support.

D. Clearance between LT & HT line carried on the same supports

Where HT & LT lines are run on the same supports the minimum distance between the lines shall be

- a) LT line & 11KV line = 3 feet (0.92m)
- b) LT line & 22KV or 33KV line = 5 feet (1.5m)

If 2 or more lines are carried on the same pole the higher voltage line shall be erected above the lower voltage line.

E. Clearance between HT lines of the same voltage carried on same supports

Clearance between circuits (Vertical formation)	Phase to phase of each circuit
11 KV .. 3'-6" (1.07m)	3'-0" (0.91m)
22 KV .. 4'-6" (1.37m)	3'-6" (1.07m)
33 KV .. 4'-6" (1.37m)	4'-6" (1.37m)

F. Minimum clearance to be adopted at crossings of lines may be as follows:

- i) Crossing between Power and Departmental communication lines:

Minimum clearance between bottom-most Power conductor and top-most conductor of communication lines.	Minimum clearance between communication lines and the ground wire where used.
LT lines -- 4'-6" (1.37m)	3'-6" (1.07m)
11 kV -- 5'-0" (1.5m)	4'-0" (1.25m)
22 kV -- 5'-0" (1.5m)	4'-0" (1.25m)
33 kV -- 5'-0" (1.5m)	4'-0" (1.25m)

14. மின்பாறைகளிலும் சாதனங்களிலும்
வேலை செய்யும் முறை

ANS: [5] [1] Safety manual

தடைக்கம்

14. (1) தடை நீக்கம் (Line clear) என்பது மின்பாறைகள் அல்லது மின் சாதனங்களின் மின் இயக்கத்தை நீக்கி அவற்றில் வேலை செய்வதற்கு அதிகாரம் அளிக்கும் அனுமதித் தூள்.

வேலை செய்ய அனுமதித் தூள் தேவை

14. (2) வேலைப்பொறுப்பை ஏற்றவர் மூன்றாம் பிற்குறிப்பி உள்ள படிவத்தில் (Form) கண்டபடி அனுமதித்தாள் பெற்று, அவ் வேலையைத் தொடங்கலாம் என்று திட்டமாக உத்தர விட்டாலன்றி எந்த வேலையாளும் மின் கம்பத்தில் ஏறுவதோ, மின் இயக்கமுள்ள பாதைகளை நெருங்குவதோ, இயங்கும் மின் சாதனங்களில் வேலை செய்வதோ கூடாது.

பொது விதிகளும் அடிப்படைக் கொள்கைகளும்

5

அனுமதித் தாள் பெறல்

14. (3) அதிகாரம் பெற்றவர்களே (authorised persons) ஒரு வேலையைச் செய்வதற்கு வேண்டிய அனுமதித் தாளைப் பெற வேண்டும். அனுமதித் தாளே முறைப்பொறியாளர் (Shift Engineer) அல்லது இயக்கப் பொறுப்பேற்ற மற்ற அதிகாரம் பெற்றோர்தாம் கொடுக்கவேண்டும். அனுமதித் தாளைப் பெற்றவர்தான் அதைத் திருப்பிக் கொடுக்கவும் வேண்டும். அனுமதித் தாளைக் கொடுப்பவரும் பெறுபவரும் ஒருவரையினும், இம் முறையைப் பின்பற்ற வேண்டும். அனுமதித் தாளே நேராகப் பெறும்பொழுது, பெறுபவர் தடை நீக்கம் செய்யவரைப் பின்தொடர்ந்து அவர் செய்வதைக் கவனித்து, தான் வேலை செய்ய இருக்கும் மின் சாதனங்கள் மின் இயக்கமுள்ள பாகங்களிலிருந்து எல்லாப் பக்கங்களிலும் பிரிக்கப்பட்டு நிலத்துடன் இணைக்கப்பட்டன (discharged to earth) என்பதைத் தனக்குத் தெரிந்தமட்டிலாவது திருப்தி செய்துகொள்ள வேண்டும்.

தொலைபேசிமூலம் அனுமதி பெறல்

14. (4) அனுமதித் தாள்கள் நேராகப் பெறமுடியாதபோது தடை நீக்கத்தைத் தொலைபேசிமூலம் அளித்தலும் பெறலும் வேண்டும். அப்போது தடை நீக்கச் செய்தியைப் பெறுபவர் தடை நீக்கத்தின் சாராம்சத்தைத் திருப்பிச் சொல்லவும், அறிவிப்பவர் அதை உறுதிப்படுத்தவும் வேண்டும். இவ்வாறு இருபாலாரும் தடை நீக்கத்தின் முக்கிய அம்சங்களைத் தெளிவாக உணர்தல்வேண்டும்; இவற்றை இருவரும் அனுமதிப் புத்தகத்தில் பதிவுசெய்து வேலை முடிந்தபிறகு தாளே ரத்து செய்து, கூடிய சீக்கிரம் தபால்மூலம் நகல்களை அனுப்பவேண்டும்.

அனுமதிப் புத்தகங்கள்

14. (5) அனுமதிப் புத்தகங்களை முக்கியமான பதிவுக் கட்டுகளாகக் (Record) கருதவேண்டும். அப் புத்தகங்களிலுள்ள அனுமதித் தாள்கள் வரிசையாக எண் இடப்பட்டனவாக இருத்தல் வேண்டும். புத்தகத்திலிருந்து பக்கத்தைக் கிழித்து எடுக்கவும், வேறு காரியத்திற்குப் பயன்படுத்தவும் கூடாது. ஏதாவது ஒரு தாளைக் கவனமில்லாமல் எடுத்துவிட்டால், அதுபற்றி அப்போதே அப் புத்தகத்தில் குறித்துக் கையெழுத்திட்டுத் தேதியையும் குறிக்க வேண்டும். கரித்தாள் (carbon paper) மூலமாகத்தான் நகல் எடுக்க வேண்டும். உதவி மின் பொறியாளர் (Assistant Engineer) அனுமதிப் புத்தகங்களைக் குறிப்பிட்ட கால இடையீடுகளில் பார்த்து விமரிசனம் செய்யவேண்டும்.

பொது விதிகளும் அடிப்படைக் கொள்கைகளும்

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இடங்களில் வேலை செய்வோரை மறநியாலோ அல்லது கவனக் குறைவாலோ அபாய எல்லைக்குள் நெருங்காமல் தடுக்கும்.

மேற்கூறிய எச்சரிக்கை முறையைத் தவிரப் பின்வரும் வழிகளையும் பின்பற்றவேண்டும். மின் மாற்றியல் (Transformer) அல்லது வெட்டவெளியிலுள்ள எண்ணெய்ச் சுற்றுத் திற்ப்படானில் (Outdoor Oil Circuit Breaker) வேலை செய்யத் தொடங்குமுன் அச் சாதனத்தின்மேல் ஏறுவதற்கான ஓர் ஏணியை அதனுடன் நன்றாக இணைத்துக் கட்டவேண்டும். அச் சாதனத்தின்மேல் வேலை செய்ய அவ்வேணியின் மூலமாகத்தான் செல்லவேண்டும். இவ் வழக்கத்தைப் புறக்கணிக்காமல் பின்பற்றிவந்தால், வேலை யாட்கள் தடை நீக்கம் பெறாத மின் இயங்கும் சாதனங்களில் தவறாக ஏறமாட்டார்கள்; ஏனெனில், ஏறுமுன் ஏணி இருக்கிறதா என்பதைக் கவனிப்பார்கள்.

பேணும் வேலைகள் செய்தல்

14. (10) சாதனங்களின் இயக்கம், பேணுதல் ஆகிய தொழில்களைச் செய்யும்போது, மின் சாதன உற்பத்தியாளர்கள் விதித்த விசேஷ எச்சரிக்கை விதிகளைக் கண்டிப்பாகப் பின்பற்ற வேண்டும்.

பின் ஊட்டுக்குச் சோதனை செய்தல்

14. (11) பின் ஊட்டுக்கு (back feed) வழி நிச்சயமாக இல்லை என்பதை உறுதிப்படுத்திக்கொள்ளவேண்டும்.

அனுமதித் தாள்களைத் திருப்பிக் கொடுத்தல்

14. (12) வேலைப் பொறுப்பு ஏற்றவர் வேலை முடிந்ததும், தம் மேற்பார்வையிலுள்ள வேலையாட்கள் எல்லோரும் சேமமான இடங்களில் இருக்கிறார்களா என்பதைத் தாமே கவனித்து, பாதுகாப்பான நில இணைப்பை (ground connection) அகற்றி, அதன் பின்னர் அனுமதித் தாளை ரத்து செய்யலாம் என அனுமதி கொடுத்தவருக்கு அறிவிக்கவேண்டும். அனுமதி ரத்து முன்றும் பிற்சேர்க்கையிலுள்ள படிவத்தின்படி செய்தல்வேண்டும்.

மின் இயக்கத்தை அகற்றல்

14. (6) சம்பந்தப்பட்ட திறப்புச் சாதனங்களைக் (switches) கொண்டு மின் இயக்கம் அகற்றப்பட்டாலன்றி, ஒரு மின் பாதையிலோ அல்லது சாதனத்திலோ ஒருவரும் வேலை செய்யக் கூடாது. மின் இயங்கும் முக்கியப் பாதையில் (mains) உள்ள எரியிழைகளை (fuses) வெளியே எடுத்துப் பாதுகாப்பான இடத்தில் வைத்துத் திறப்புச் சாதனங்களைத் திறந்த நிலையில் வைத்து அவற்றை மூடமுடியாதபடி பூட்டவேண்டும்.

அனுமதி தரப்பட்ட மின்சுற்றுகளை அடையாளமிடுதல்

14. (7) மின்சுற்றுகளில் (circuits) தடை நீக்கம்பெற்ற பாகங்களுக்கு அடையாளத் தகடுகள் இட்டு, அதன் பேரில் 'இதில் ஆள்' (MEN ON LINE) என்ற எச்சரிக்கைப் பலகைகளை வைக்கவேண்டும். அந்தப் பாகங்களுக்குச் சம்பந்தப்பட்ட திறப்புச் சாதனங்களின்மீது [எண்ணெய்ச் சுற்றுத் திறப்பான் (Oil Circuit Breaker), காற்றுச் சுற்றுத்திறப்பான் (Air Break Switch), இயக்கப் பலகை (Control Panel) ஆகியவற்றின் மீது] 'ஆட்கள் வேலையில்—இயக்காதே' (MEN WORKING—DO NOT SWITCH ON) என்று எழுதிய எச்சரிக்கைப் பலகைகளை வைக்கவேண்டும்.

மின் இயக்கமுள்ள சாதனங்களைப் பழுதுபார்த்தல்

14. (8) மின் இயக்கமுள்ள சாதனங்களில் அதிகாரம் பெற்றவர்களைத் தவிர மற்ற எவரும் எந்தவிதமான பழுதும் பார்த்தல் கூடாது. அதிகாரம் பெற்றவர்களும் பழுதுபார்க்கும் போது, அந்த வேலைக்குள்ள முன் எச்சரிக்கை விதிகளைத் தவறாமல் பின்பற்றவேண்டும்.

மின் இயக்கமுள்ள சாதனங்களைச் சுற்றி அபாய எல்லைக் குறித்தல்

14. (9) அடுத்துள்ள மின் சாதனங்களில் மின் இயக்கம் இருக்கும்போது தடை நீக்கம் பெற்ற சில சாதனங்களில் வேலை செய்யவதானால், அபாய எல்லையைச் சுற்றிலும் ஓர் அங்குலம் பருமனுள்ள மணிலாக் கயிற்றைத் (manila rope) தரை மட்டத்துக்கு 3 அடி உயரத்தில் கட்டவேண்டும். அக் கயிற்றில் 'அபாயம்' என்று வெள்ளைப் பூச்சின்மேல் தபால் ஆபீசுச் சிவப்பு வர்ணத்தில், ஆங்கிலத்திலும் தமிழிலும் எழுதப்பட்ட எச்சரிப்புப் பலகைகளை ஏற்ற இடங்களில் தொங்கவிடவேண்டும். அது, கயிற்றின் எல்லைக்குள் அபாயம் என்பதையும், அதற்கு வெளியே வேலை செய்யச் சேமமானது என்பதையும் உணர்த்தும்; சேமமான

6.0 Open Tender :

- 6.1 Tenders shall be invited by advertisement of tender notices in the dailies having wide circulation in the State. The Competent Authority should ensure that the cost of advertisement is commensurate with the value of the proposed supply/work.
- 6.2 When the tenders relate to specialised work or supply of materials, the tenders may be advertised in the dailies having wide circulation both inside as well as outside the State. When the suppliers are known to be very limited, open tender need not be issued, after recording the reasons.
- 6.3 Particular care may be taken to advertise the tender notice in the dailies which are being circulated in the area from where tenders at competitive rates may be anticipated. When the value of the order is less than Rs. 2 lakhs, specific reason should be recorded if open tender is resorted to.
- 6.4 Materials required exclusively for Transmission lines and sub-stations are of few categories and their suppliers are also very few. The suppliers of these materials may be duly registered and requirements may be procured from those registered firms on limited tender basis. Such limited tenders may be treated as open tenders for all purposes.
- 6.5 Procurement of vehicles at rate contract prices outside the DGS & D rate contract by issuing limited enquiries to manufacturers of vehicles may be treated as open tender purchase.
- 6.6 In the case of Civil works costing less than Rs. 5 lakhs Tender notices shall not be published in the dailies but shall be sent to all the Registered Contractors in the Division/Circle concerned, with a copy to other Divisions in the Circles and Superintending Engineer of the Circle for display in the Notice Boards. Such tender calls shall be considered as an open tender.
- 6.7 For civil works costing above Rs. 5 lakhs, tender notice shall be published in one insertion in one in each of the English and Tamil dailies having wide circulation in the State and also in English and Tamil in Tamil Arasu. In the case of contracts relating to specialised works such as tunnelling, penstock fabrication, supply and erection of gates etc., tender notice shall be published in only one of the leading dailies having wide circulation both inside and as well as outside the State in English and Tamil in one insertion and also in "Tamil Arasu" both in English and Tamil.

10.0 Tender Specification

- 10.1 Tender specification shall be specific so that there shall be no room for ambiguity.
- 10.2 The Tender forms and documents shall be supplied to the intending tenderer at the rate prescribed from time to time by the competent authority.
- 10.3 The Tender documents should include :
 - i) Standard specification setting out the technical requirements and commercial terms.

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- ii) In the absence of Standard specification, a complete specification of the work to be executed, the materials to be used or the supply of materials to be made.
- iii) A schedule of quantities of various items of work to be executed or supply of materials to be made.
- iv) A complete set of drawings showing the general dimension of the proposed work or materials and
- v) A set of conditions of the contract.

21.1 If any tender is to be rejected for any reason, other than for non-compliance of the conditions regarding Earnest Money Deposit, or for indicating prices along with the technical bid (Envelope A) in a two part tender, approval of the competent authority should be obtained. The reasons for the rejection should be clearly recorded in the note. Technically unsuitable tenders need not be evaluated, subject to the approval of the competent authority. In other cases where the offer is technically suitable but could not be considered for other reasons, the advantages/disadvantages of accepting the tender have to be clearly brought out in the Tender note for competent authority's orders.

21.2 The tender shall be rejected if it is:

- (i) not in the prescribed form,
- (ii) not accompanied by the required Earnest Money Deposit or proof of Permanent Deposit or proof of exemption.
- (iii) not properly signed by the tenderer,
- (iv) from any blacklisted firm or contractor,
- (v) received after the expiry of the due date and time,
- (vi) received by telex or telegram,
- (vii) not accompanied by an undertaking/agreement where Earnest Money Deposit/ Security Deposit is to be exempted,
- (viii) not in conformity with Board's technical specifications;
- (ix) from an approved tenderer whose Permanent Earnest Money Deposit is not adequate for the particular tender.

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Note: Adjustment against Permanent Earnest Money Deposit towards amounts due from a supplier/contractor shall be made only if the supplier/contractor fails to pay the amount to the Board when called upon in writing and such adjustments when made must immediately be intimated to the deposit holders in writing by registered post with acknowledgedgement due, with copy to all divisions of Technical Branch.

- (x) From a tenderer who is directly or indirectly connected with Government service or Board's service or service of local authority."
- (xi) From a tenderer whose past performance or vendor rating is not satisfactory.
- (xii) From a tenderer who has indicated the price in the technical/commercial bid (Envelope A) in a two part tender.

Note: The Chief Engineer/Materials Management will maintain a Register recording the performance of various suppliers/Contractors and make entries therein regarding the performance while closing each Purchase Order and this Register may be made use of for vendor rating.

22.0 Negotiation.

19.0 Opening of Tender

19.1 The tender shall be opened by the officer authorised by the Competent Authority in the presence of another officer from the Accounts Branch of the Board/Circles and also in the presence of the tenders or authorised representatives who may choose to be present at the declared date, time and place. The names of the officers who opened the Tender should be recorded.

In respect of two part system of tenders, the technical and price bids are to be furnished separately as detailed in regulation 18.4 and the bids opened separately as detailed in Regulation 19.5.

19.2 The signature of the tenderers or authorised representatives present at the time of opening the tender shall be obtained in the register.

19.3 At the time of opening the tenders, any offer which does not satisfy the END conditions should not be opened or read out. They are to be returned by the prescribed officer to the tenderers later on stating the reasons for rejections. In respect of all other tenders, the officer opening the tender shall initial each tender and also attest all corrections in each tender. The total number of corrections in each sheet should be indicated by the Tender opening authorities.

19.4 If there are corrections in the tender unattested by the tenderer, the officer shall make a note of the same in the tender itself and bring to the notice of the tenderer or his authorised representative the fact of such unattested corrections.

19.5 (i) All other tenders received within the prescribed time limit should be opened. Any objections by any of the officers engaged in tender opening or the tenderers or their representatives present should be recorded. Tenders, including any objected tenders but excluding those already rejected should be included in the read out statement. All the tenders, including the objected tenders, may be analysed in detail and put up to the Competent Authority with full details of the objections so as to enable the deciding authority to take a considered decision of the acceptability or otherwise of the tender.

(ii) In two part system of tenders, envelope A of those bidders who satisfy the requirement of Earnest Money Deposit will only be opened at the time notified for opening. If any of the bidders indicates the price in envelope A, the bid will not be read out and be rejected. Envelope B shall not be opened at the time of opening envelope A, but will be authenticated on the covers by the officers authorised to open the bids. Envelope B so authenticated will be kept under the safe custody of the empowered officer (to open the tender).

19.6 In the case of two part tenders, after opening the outer sealed cover, the officer opening the tender shall open only the cover containing the technical offer and place the cover containing the commercial offer in a sealed box or locker to be opened after analysing the technical offer.

19.7 The offers of the tenderers with brief particulars, both technical and commercial, shall be recorded in a statement at the time of opening to tender and signed by the Tender opening authority.

In respect of two part tenders, the read out statement of envelopes A, other than those rejected for indicating price shall be circulated to the authority competent to decide the tender for information either on the same day or on the next working day. Where tenders are to be decided by the Board level Tender Committee or the Board, the read out statement shall be put up to the Chief Engineer concerned.

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ANS: 7[a]

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Open access :It means the non-discriminatory provision for the use of transmission lines or distribution system or associated facilities with such lines or system by any licensee or consumer or a person engaged in generation in accordance with the regulations specified by the Appropriate Commission. (2)

- section 2(47) of IE Act 2003

Wheeling : It means the operation whereby the distribution system and associated facilities of a transmission licensee or distribution licensee, as the case may be are used by another person for the conveyance of electricity on payment of charges to be determined under section 62. (2)

- Section 2(76) IE Act 2003

Transmission Utility and functions

1. The State Government may notify the Board or a Government company as the State Transmission Utility:

Provided that the State Transmission Utility shall not engage in the business of trading in electricity:

Provided further that the State Government may transfer, and vest any property, interest in property, rights and liabilities connected with, and personnel involved in transmission of electricity, of such State Transmission Utility, to a company or companies to be incorporated under the Companies Act, 1956 to function as transmission licensee through a transfer scheme to be effected in the function as transmission licensee through a transfer scheme to be effected in the manner specified under Part XIII and such company or companies shall be deemed to be transmission licensees under this Act.

2. The functions of the State Transmission Utility shall be -

- a. to undertake transmission of electricity through intra-State transmission system;
- b. to discharge all functions of planning and co-ordination relating to intra-state transmission system with -
 - i. Central Transmission Utility;
 - ii. State Governments;
 - iii. generating companies;
 - iv. Regional Power Committees;
 - v. Authority;
 - vi. licensees;

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Transmission Of Electricity

- vii. any other person notified by the State Government in this behalf;
- c. to ensure development of an efficient, co-ordinated and economical system of intra-State transmission lines for smooth flow of electricity from a generating station to the load centres;
- d. to provide non-discriminatory open access to its transmission system for use by-
 - i. any licensee or generating company on payment of the transmission charges ; or
 - ii. any consumer as and when such open access is provided by the State Commission under sub-section (2) of section 42, on payment of the transmission charges and a surcharge thereon, as may be specified by the State Commission:

Provided that such surcharge shall be utilised for the purpose of meeting the requirement of current level cross-subsidy:

Provided further that such surcharge and cross subsidies shall be progressively reduced and eliminated in the manner as may be specified by the State Commission:

Provided also that such surcharge may be levied till such time the cross subsidies are not eliminated:

Provided also that the manner of payment and utilisation of the surcharge shall be specified by the State Commission.

Provided also that such surcharge shall not be leviable in case open access is provided to a person who has established a captive generating plant for carrying the electricity to the destination of his own use.

(a) The generation planning mainly concerns with the expansion of the generating network and the special focus are:

- Capacity addition by the distribution licensee, IPPs, Co-Generators and Captive Generators.
- Flows from central sector power stations
- Expected power flow through Trading of Power
- Adoption and effectiveness of Demand Side Management and Energy Conservation Measures.
- Optimization of existing capacity through renovation and modernization.
- Utilizing the off peak surplus from base load station for the pumped storage plants during pump mode operation
- Environmental and financial constraints

- Fuel prices and availability

(b) The important key issues with respect to the generation planning are:

- Predicting the establishment of new generation capacity, including where, when and how much
- Predicting generation despatch;
- Provision towards generation reserve for reliability of supply
- Predicting decommissioning of old generation capacity
- Environmental regulation leading to an increasing amount of renewable energy sources generation with prioritized Grid access.
- The impact of wind energy generators, Co-Generators and Captive generation units on the dynamic performance of the power system considering its special nature.
- Impact of large generating plant on the Grid
- Increasing amount of non-despatchable generation
- Marginal costs for generators
- Price elasticity of consumers
- Market player's estimates of future power prices
- Rules for access to the capacity on the interconnection

(d) The STU shall analyze the planning problem by making use of software models, simulation programs etc., of power system engineering. Possible applications are:

- Predicting the generation capacity and despatch by including system reliability, marginal generation costs, future electricity price and future environmental policy, through dedicated models
- Simulation of different scenarios in capacity development and generation despatch for the development of a flexible transmission grid structure.
- Integrated resource or least cost planning methods to evaluate the potential capacity addition resources and uncertainties and to determine the best mix of sources.

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- o Probability methods for generation planning by representing generating unit failure and repair processes, load variability due to weather and other uncertainties.

Note: Many hydro stations in Tamil Nadu are tied up with irrigation schedules and these stations have to be closed down during certain period of the year. Also in case of monsoon failure, many hydro stations cannot be operated at full capacity. For estimating peak availability and energy availability for generation planning, these peculiarities shall be taken into account.

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Grid Code

ANS: 7[d]

CHAPTER 6

Grid Connectivity Conditions

6. Objectives

(1) The objectives of the grid connectivity conditions are to ensure that (a) the basic rules for connections are complied with to treat all agencies in a non-discriminatory manner (b) any new or modified connections, when established, shall neither suffer unacceptable effects due to its connection to the transmission system nor impose unacceptable effects on the system of any other connected agency (c) the ownership and responsibility for all the equipments, shall be clearly specified in a schedule (Site Responsibility Schedule) and (d) a prospective user is well informed, in advance, of the standards and conditions his system has to meet, for being integrated into the existing power system, the standards and parameters of the existing system with which his system has to be interfaced and the electrical environment in which his system has to operate.

(2) Scope:

The connectivity conditions apply to all State / Central Government sponsored generating companies, captive power generators, IPPs, STU, transmission / distribution Licensees, Bulk Consumers and all the users seeking new connection with the intra state transmission system including the existing transmission licensees and the users who may be required to modify / upgrade their systems.

(3) Procedure for connection:

- (i) STU shall identify opportunities for new connections and optimal locations after conducting the system studies in co-ordination with the organizations listed under the respective sections of the Act, namely Section 39(2)(b) for the STU and in conformity with the National Electricity Plan drawn by the Authority under Section 3(4) of the Act.
- (ii) STU shall furnish details of the prospective connection points in respect of their system on their web-site inviting initial application from the users
- (iii) Connection may also be sought for locations other than those described in (i) and (ii).

(iv) In all the cases covered by the points (i),(ii) and (iii) above, the users and transmission licensee shall forward their request for grid connectivity to the STU, as the case may be, in the proforma prescribed by the STU. Proforma for different categories of users shall be made available on STU's web-sites and shall inter-alia, include technical data pertaining to generating unit(s) / transmission system / distribution system / load, single line diagram and topographical map showing the location of the proposed user's apparatus and equipment.

(v) The prospective users shall be required to pay to the STU/transmission licensee the charges as (proposed by STU/transmission licensee) approved by the Commission, for the purposes of conducting initial interconnection studies, any additional studies as well as processing the application.

(vi) On receipt of the request from the user & transmission licensee along with the prescribed charges, the STU / transmission licensee shall, within one month of receipt of the proposal, accept the proposal or suggest modifications thereto. In the event of user / transmission licensee requesting for any specific information / study / data from the STU / transmission licensee for the purpose of grid connectivity, the STU/transmission licensee shall make the same available to the user /transmission licensee

(vii) STU shall be entitled to reject any application for connection to/or use of State Transmission System if such proposed connection is likely to cause breach of any provision of its license or any provision of the Grid Code or any provision of IEGC. In the event of any dispute with regard to modifications, not being acceptable to the user, the user may approach the Commission for dispute resolution.

(viii) The STU/transmission licensee and the user/ transmission licensee shall enter into a Connection Agreement within two months of acceptance of the proposal. The Connection Agreement shall contain time schedule for completion of the facilities of User and STU/ transmission licensee, both indemnifying the delays on the part of the other. Both the parties shall inform the progress of major milestones to each other. The time limit for entering into the connection agreement may be extended, if both parties agree.

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(ix) Copies of the Connection Agreement shall be sent to the transmission licensee, load dispatch centre, Regional Power Committee, Commission and the Authority.

(x) Upon fulfillment of all the conditions, STU shall notify the agency that it can be connected to the STS.

(xi) In respect of existing connections, the Commission may allow relaxation up to 2 years in respect of connection agreements. The process of renegotiation of the connection conditions of the STS should be completed within the above period. Due to any reason if this process gets delayed further, Commission may consider relaxation for a further period for which a petition will have to be filed by the concerned constituent along with STU's recommendations / comments. The present agreements may continue till such renegotiation and revised agreements are over.

(xii) The cost of modification, if any, shall be borne by the concerned constituent. The STU shall normally make a formal offer to the agency within two months. The offer shall specify and take into account any works required for the extension or reinforcement of the Transmission System to satisfy the requirements of the connection application and for obtaining statutory clearances, way leaves as necessary.

(4) General Connectivity Conditions

A prospective user and transmission licensee proposing a new connection shall comply with the following conditions:

- i) The user shall meet the requirements in accordance with the provisions of Standards on Grid Connectivity and Grid Standards specified by the Authority and IEGC specified by CERC.
- ii) Requisite protections shall be provided in the user's system to protect the Grid from the faults originating in the user's systems.
- iii) Notwithstanding the protection systems provided in the Grid, the user/ transmission licensee shall provide requisite protections for safeguarding his system from the faults originating in the transmission system / Grid.

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(iv) No user of the Grid shall exceed the Harmonic Distortion Level specified in the CEA (Grid Connectivity) Regulations.

v) The user shall furnish requisite data to the STU / transmission licensee for enabling it to conduct interconnection studies.

vi) The user is obliged to cooperate with the STU, transmission licensee and load dispatch centre in respect of the operational matters listed below, but not limited to: -

- a) Carryout the modifications in his equipment considered necessary, whenever the power system is upgraded or modified
- b) Protection coordination (relay settings)
- c) Provide on line data to the appropriate load dispatch centre
- d) Participate in contingency operations such as load shedding, islanding, black start, providing start-up power and restoration
- e) Furnish data to the STU / transmission licensee, SLDC and any committee constituted by appropriate Government or Authority for disturbance analysis and other studies
- f) Coordinated outage plan of the State/Region
- g) Prompt implementation of instructions of load dispatch centre.

(vii) The user's equipment at the site owned by the transmission licensee shall be maintained promptly and properly by the user and vice versa so that the equipment and personnel of the site owner are not jeopardized by the neglect of the other entity.

(5) Connection Agreement:

Every connection of a user's system to the transmission system shall be covered by a Connection Agreement between the user and the transmission licensee. The Connection Agreement shall contain general, specific, technical and financial conditions, applicable to that connection. A connection agreement shall include (but not limited) as appropriate, within its terms and conditions, the following:

- i. A condition requiring both parties to comply with Indian Electricity Grid Code and Tamil Nadu Electricity Grid code, provisions under the Act, other Codes and regulations issued by the Commission / CEA.

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419. (a) (Issues are made in all cases only on the Requisition authority of requisitions) (M.E.D. Form 51). (The requisitions are written in quadruplicate by carbon process and should be filled up very carefully as all subsequent accounting depends upon it. One copy is retained by the requisitioner as his office copy and the other three copies are after countersignature by the Assistant Engineer presented to the Store-keeper for compliance.) The quadruplicate fast copy should

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not be detached from the requisition book. (In special and urgent case, Store-keepers may issue materials without countersignature by the Assistant Engineer. But in such cases the requisition with the subordinate in charge of the work should be sent to the Assistant Engineer who will countersign it and forward it to the Stores within three days of the receipt of materials. The Store-keeper will note in the other three copies of the requisition that one has been countersigned by the Assistant Engineer.)

Responsibility of Assistant Engineers for requisition. Note: (1) (In exceptional and urgent cases, however, issues may be made on Transport Notes or slips issued by the Field Officers. Issues of this kind should be very rare and should be regularised by obtaining requisitions immediately thereafter. It will be incumbent on the Officers who draw materials without requisitions to send promptly a requisition in proper form and the requisition should in any case be furnished within 6 days of the drawal of materials.)

(2) Such issues should be entered by the Store keepers in a Register in the prescribed form as soon as the transactions are over and noted therein the number and date of requisition as soon as this is received from the field officer concerned. The Store-keeper should remind for the requisitions if these are not received within a maximum period of 6 days from the date of issue.)

(3) The register should be submitted to the Superintending Engineer by the Stores Superintendent every month so that he may satisfy himself that justifiable circumstances existed for the field officers to draw materials without requisition and also to see that the requisitions are being promptly received.

(4) (All issues without requisitions should be simultaneously posted in the Bin cards giving reference to Transport Note or authorisation slip with reference to which materials were issued. When requisitions are received lateron reference to the requisition should be noted against the relevant entries in the bin cards.)

(b) In regard to preparation of Requisition for coal issued to Boilers at Basin Bridge Power House of the Madras Electricity System, the following procedure is followed:—

Requisitions are prepared at the close of the day and posted into the SIB with reference to the Registers maintained at the weighing machines which give

uptodate information as to the quantity of coal delivered. In other respects, the rules observed in regard to writing up of requisitions are followed in this case also.

420. (All requisitions should bear the work order and account numbers in addition to a brief description of the work.) Ordinarily a requisition will be for materials to be drawn on a single account or work. When it is unavoidable to issue a single requisition for the two or more works, the account numbers, work order numbers against each material should be distinctly given. (The Assistant Engineer countersigning the requisition is responsible for seeing that a work order has been issued for the work and that the requisition is limited to its actual requirements.)

421. Stores are expected to be drawn only for immediate use on the works. They should not be drawn in advance and more than the requirements as no materials accounts at site are maintained.

Note.--The Store-keeper should issue the materials immediately the indents are presented to him in the order of the indents received by him. Generally all issues from stores should be before 12 noon each day, except in really very emergent cases.

422. In case (where materials are issued to departmental employees, contractors, or the public, acknowledgment of the parties or their authorized agents should be obtained in the requisition form kept in the stores. In all cases of issue of materials from stores where the person physically present to take the materials is one other than the drawing officer or the party concerned, there should be an indication in requisitions as to the person to whom the materials are to be handed over and his acknowledgment should always be taken at the time of issue of materials. A register should be maintained by the Store-Keeper showing the specimen signature of the drawing officers who sign requisitions for drawal of materials from his stores. The messenger authorised by the drawing officer to receive materials from the store-keeper should sign in the requisition in the presence of the drawing officer,

Acknowledgment of materials.

before the latter's authorisation. The messenger will again sign in the requisition in the presence of the store-keeper at the time of receiving the materials by way of acknowledgement. This signature will be compared by the store-keeper with the signature originally affixed in the endorsement by the messenger in the presence of the drawing officer to satisfy himself about the identity of the person.)

Notes. (Requisition books, devolution books, stores transfer note-books, work order books, stores issue books, stores receipt books, transport notebooks, time roll books, log books, fuse of calls, bill books, etc., are of money value in that their use results in financial transactions. They should therefore be used only one at a time and the same care as in the case of measurement books, receipt books, etc., should normally be taken.

For this purpose the Store-keepers in charge of the stores shall be the custodians of Requisition books, Devolution books, S.I.Bs. and S.R.Bs., Transport note books, Stores transfer notes for the requirements of the field officers in the stores area and shall maintain a register showing their receipts and issues. This register should be sent to Accounting Department for review along with the Stores Abstract Book-Vide paragraph 425.

The following instructions should be observed :-

- (1) A line should be drawn entering across the page under each item of a requisition and if there is any space left, double lines should be drawn diagonally across the blank space in opposite directions.
- (2) If the materials as per exact specification of the requisition are not available in the stores, the Store-keeper should run a line through that item over his initials and write 'not in stock'.
- (3) Under no circumstances, should any corrections be made in the requisition by the Store-keeper in respect of quantities except under the initials of the requisitioning officer, nor should materials differing those specified be issued.)
- (4) If there is in stock an article, very near that specified, then the Store-keeper should make a note on the requisition covering those materials which he is able to issue to that effect and if the material is required, he should issue it on a new requisition which will be completed in exactly the same manner as other requisitions.
- (5) When requisitioning for materials, the several component parts of any article should be shown as separate items, for

example, if a 10 K.V.A. transformer with oil, hooks and primary cutouts is required, then the transformer should be one item, the oil a second item, the hooks a third item and the primary cutouts the fourth item. It should be clearly understood that no materials forming part of an article should be issued unless the requisition clearly calls for that article, even in the case of articles like transformers which are listed in the ledgers as complete with oil, hooks and so forth.

(6) In no case, should additions and alterations be made in a requisition, as there is no possible way of telling whether the additions have been made after or before the requisition was presented. The Store-keepers should not accept unattested alteration and corrections and return the requisitions for the issue of a new one, if necessary. Any correction found necessary due to items not supplied or short supplied for want of sufficient stock should be initialled by the party receiving the material and also attested by the Store-keeper in all the copies of the requisition. Requisitions shall be current only for 7 days from the date of requisition by the Junior Engineer; lapsed requisitions should not be presented to the Stores.)

(7) In the case of materials returned back to Stores, only devolution notes should be used.)

Valuation of stores transaction. ANS: 8 [b]

427. The following procedure shall be adopted in Central Office in pricing the stores.

(a) In regard to materials received from Suppliers the receipts are valued at invoice rates. If these rates are not available, the rates showing the relevant Purchase Order are adopted. If the Purchase Order rates also are not available, the current market rates or valuation approved by the Superintending Engineer is adopted. Later, when the bill is passed for payment, adjustment is simultaneously made for the difference between the bill amount passed for payment and the amount initially debited, thus bringing the final figure equal to the bill amount.

(b) (i) When dismantled materials or surplus materials are returned to stores from works, such stores are ordinarily valued at the original issue rate unless there is a general revaluation of stock when depreciated value can be adopted, wherever needed.

(ii) In cases where materials have heavily deteriorated (e.g.) if they cannot be put to ready use with equal efficiency without some repairs it is permissible to take them into stores at a depreciated value. Unless this is done, the cost of works will not take into account the cost of wear and tear of the materials used on works. This will not, however, apply to depreciation in regard to heavy tools and plant of construction works devoluted to stock, for which see instructions in para 449-A infra.

(iii) Where tools and plant articles issued to field have been worn out and are no longer fit for use, they should be survey reported under orders of competent authority by the field and then returned to stores as scrap item only. In this case the receipt will be taken into

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the "scrap" folio at the scrap value given by the field officer in the devolution note.)

NOTE:— The devolution note in all cases of return of materials, tools and plant etc. should contain the following particulars.

(i) When the materials were originally issued to work, giving reference to requisition number and date on which originally issued.

(ii) condition of the materials; if the materials have been worn out, the percentage of depreciation that has to be allowed, and

(iii) recommendations.

(c) When materials are received from other systems or circles of the department, a provisional value with reference to valuation of similar articles in the priced ledger is initially adopted. On receipt of the debit advice from the Issuing System or Circle, adjustment will be made with plus or minus entries so as to bring the total value in respect of the material to the value intimated in the Debit advice.)

(d) Where materials are transferred from one store to another of the same system or circle, the valuation of the receipt is done with reference to the issue rate obtaining in Priced Stores Ledger of the Issuing Stores, which is readily available in the Pricing Section and not with reference to the issue rate shown in the Priced Stores Ledger of the Receiving Stores.)

Compensation for trees cut along transmission lines:—

548. The following procedure is laid down for payment of compensation for trees cut along transmission lines:—

ANS: 8 [C] TNEB MANUAL VOL-1

A construction

(1) Soon after the survey of a transmission line a schedule of trees to be cut should be prepared in M.E.D. Form* in triplicate and the duplicate and triplicate thereof sent to the Divisional Engineer and the Central Office. A work order for the tree clearance work should be got duly sanctioned. Before cutting the trees the Supervisor or the Junior Engineer should fill up the certificate for compensation for the tree clearance in M.E.D. Form 152 and the valuation statement of damage on transmission lines in M.E.D. Form 151. The value of the trees should be fixed with due regard to girth, age, fruit-bearing nature, locality, etc., and in consultation with the local revenue authorities. In all cases the owner's signature should be obtained in M.E.D. Form 152 witnessed by the village officials or the Revenue Inspector in token of his acceptance of the number and description of the trees cut. His signature should also be ordinarily taken on the valuation statement in M.E.D. Form 151 in token of his acceptance of the valuation. If the owner refuses to accept the valuation made by the department, his signature on M.E.D. Form 151 need not be insisted upon but he should be definitely informed of the value assessed by the department. Officers of the department have always a right to proceed with their work even though exorbitant claims for compensation are made by the parties. It should be stipulated before fixing the amount of compensation whether the felled trees should be handed over to the owner or not.

(2) The triplicate of M.E.D. Form 152 should be handed over to the owner of the trees. After clearance, the duplicate of M.E.D. Form 152 and the duplicate, and triplicate of M.E.D. Form 151 with measurement book

*Not printed.

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entries and wages rolls for the labour employed for cutting the trees sent to the Chief Accountant through the Assistant Engineer.

(3) In cases where it is stipulated that the felled trees are not handed over to the owner, they should be auctioned and the sale-proceeds credited into the treasury to Public Works Remittances—J. Remittances into the treasury and the chalan sent to the Chief Accountant with details. The Assistant Engineers have powers to approve the sanction if the amount of compensation does not exceed Rs. 250. In other cases the sale will not be considered as completed unless it is confirmed by the Divisional Engineer. Before submission of the wages rolls and valuation statements for payment, the following information should be furnished both in the measurement book and the valuation statement:—

- (i) When the trees were cut?
- (ii) How they were disposed of?
- (iii) The date of auction and amount realized.
- (iv) Reference to chalan number for remittance.
- (4) If the trees to be cut belong to local bodies or other departments of Government, the officers concerned of the local body or the department of Government should be addressed and the consent for the valuation obtained in writing before clearance; where cut trees are handed over to the owners no compensation is paid to the owners.

(5) During construction cases may arise in which damage may be caused to existing crops in the fields through which the lines are to be erected. The procedure outlined above for tree clearance should be followed in this case also except that compensation is always payable on such cases.

(6) At the time of erection of line young plants and small trees should not be ignored on the ground that they do not cause any obstruction then. As they may be a source of nuisance after some time it is generally

necessary to include them in the schedule prescribed in sub-paragraph (1) above and to have the compensation paid in the first instance only.

ANS : 8(d) TNEB MANUAL VOL-I

Estimates—Administrative approval and technical sanction.

Administrative- 489. Except to the extent delegated in Appendix I of this Manual, all works require the administrative approval of Board. (The administrative approval is, in effect, an order to execute a certain specified work at a stated cost.) It is to be noted that, for almost all works both the administrative approval and technical sanction are to be accorded.

Technical sanction 490. (For each individual work to be carried out after obtaining administrative approval a detailed estimate

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AND MAINTENANCE

must be prepared for the technical sanction of authority competent in the Electricity Board. This sanction is known as the Technical sanction and must be obtained before the execution of the work is commenced. As its name indicates, it amounts to no more than a guarantee that the proposals are technically sound and that the estimates are accurately calculated and based on adequate data.)

491. (If, in working out the detailed estimates, it is found necessary to make any important deviation from the design to which administrative approval has been obtained or if the cost will exceed the estimate, administratively approved, by more than 10 per cent, revised administrative approval must be obtained before technical sanction is accorded. It is a waste of public money to prepare detailed plans and estimates for works which are not likely to be sanctioned. It is therefore enough if sketch plans and statements of probable costs only are prepared for obtaining administrative approval. This rule will apply to all works for which administrative approval of Government is sought.