

Øekad 228]

fnukad 31 vxLr 2012

NRrhlx<+ jkT;
fo|qr fu;ked vk;ksx
flapkbZ dkWyksuh]
'kkafr uxj] jk;iqj

jk;iqj] fnukad 31 vxLr 2012

Øekad 40@lh-,l-bZ-vkj-lh-@2011 /kkjk 86 ¼41½ ¼4,p½ fo|qr
vf/kfu;e 2003 ¼4o"kZ 2003 dk Ø 36½ dh lgifBr /kkjk 181 ¼4tsM-ih-
½ esa iznRr 'kfDr;ksa dk iz;ksx djrs gq, NRrhlx<+ jkT; fo|qr
fu;ked vk;ksx] fuEufyf[kr fofu;e cukrk gS] ftUgsa ^^NÙkhlx<+
jkT; fo|qr fxzM lafgrk 2011^^ ds :i esa tkuk tk,xkA

v;/k;&1

izk

Dd

Fk

u

,oa

ifj

Hk

k"

kk

1-1 izkjafHkd&

fo|qr vf/kfu;e] 2003 ¼4,rn~i'pkr~ vf/kfu;e½ dh /kkjk 86 ¼41½
¼4,p½ esa ;g mYysf[kr gS fd jkT; vk;ksx dks ,d jkT; fxzM
lafgrk fofufnZ"V djuh pkfg, tks fd Hkkjrh; fo|qr fxzM lh-
½ ds vuq:i gks] vf/kfu;e ds blh izko/kku ds vuqikyus esa
NRrhlx<+ jkT; fo|qr fu;ked vk;ksx ¼4lh-,l-bZ-vkj-lh-½ }kjk
^^NRrhlx<+ jkT; fo|qr fxzM lafgrk&2007^^] dks Hkkjrh;
fo|qr fxzM lafgrk 2005 ds vuq:i vf/klwfpr fd;k x;k FkkA vc
pwafd dsUnzh; fo|qr fu;ked vk;ksx }kjk uohu vkbZ
dj nh xbZ gS] vr% bl fxzM lafgrk dks Hkkjrh; fo|qr fxzM
dksM fofu;e] 2010 ds vuq:i cuk;k x;k gSA ;g fxzM lafgrk ,d
fof/kd :i ls izorZuh; ekU; lhek fu/kkZjd nLrkost gksxk] ftlds
izko/kkuksa dk jkT; ikjs"k.k iz.kkyh ls tqMs+ leLr bdkb;ksa
}kjk vuqikyus fd;k tk,xkA ,d n{k vkSj lefUor jkT; ikjs"k.k
iz.kkyh dks lqfufpr djus vkSj jkT; ikjs"k.k miØe dks
jkT;karxZr ds lkFk&lkFk varjkZT;h; fo|qr ikjs"k.k ds ¼4tgka
dgha iz;ksT; gks½ laca/k eas vius nkf;Roksa dk vuqikyus
djus ds fy, ;g lafgrk cukbZ xbZ gSA

1-2 laf{kIr 'kh"kZd] foLrkj vkSj izorZu%

1- + jkT; fo|qr fxzM lafgrk 2011 vFkok jkT; fxzM lafgrk 2011

dgyk,axsA

2- bu fofu;eksa dk foLrkj laiw.kZ NRrhlx<+ esa gksxkA

3- ;s fofu;e] NRrhlx<+ jkti= esa vius izdk'ku dh fnukad ls izHkko'khy gksaxsA

1-3 ifjHkk"kk,a&

bu fofu;eksa esa] tc rd lanHkZ ls vU;Fkk visf{kr u gks rc rd%&

$\frac{1}{4}1\frac{1}{2}$ vf/kfu;e^ ls vfHkizsr gS] ;Fkk la'kksf/kr fo|qr vf/kfu;e] 2003 $\frac{1}{4}0$ "kZ 2003 dk

Øzeakd $36\frac{1}{2}$ (

$\frac{1}{4}2\frac{1}{2}$ ^lfØ; ÅtkZ $\frac{1}{4}$,fDVo ,uthZ $\frac{1}{2}$ ^ ls vfHkizsr gS] fdlh fo|qr ifjiFk esa fdlh fuf'pr

le; ds vUrjky esa mRikfnr] izokfgr vFkok iznRr ,slh fo|qr ÅtkZ] tks rRle;

fo|qr 'kfDr dk vfHkUu Hkkx gks ftls okV izfr ?kaVs ;k mlds ekud xq.kdkas dh

bdkbZ;ksa esa uki tk ldrk gksA tSls%&

1000Wh=1KWh=1Unit, 1000KWh=1MWh, 1000MWh=1GWh=1MU (Million Untis)

$\frac{1}{4}$ Wh=okV izfr ?kaVs]KWh=fdyksokV izfr ?kaVk] MWh=esxkokV izfr ?kaVk]

GWh=fxxkokV izfr ?kaVk] MU=fefy;u bdkb;kWa $\frac{1}{2}$

$\frac{1}{4}3\frac{1}{2}$ oj $\frac{1}{2}$ ^ ls vfHkizsr gS ekud xq.kdkas dh bdkbZ;ksa esa ekik x;k

oksYVst rFkk mlds Qst ds varoZrhZ izR;korhZ /kkjk ds Hkkj dk xq.kuQy tSls%&

1,000W=1KW, 1,000KW=1MW, 1,000MW=1GW

(W= okV]KW= fdyksokV] MW=esxkokV] GW=xhxxkokV $\frac{1}{2}$

$\frac{1}{4}4\frac{1}{2}$ oj $\frac{1}{2}$ ^ ls vfHkizsr gS] ekud xq.kdkas dh bdkbZ;ksa esa ekih xbZ

oksYVst vkSj ,Eih;j esa mlds fo|qr /kkjk dk xq.kuQy tSls&

1000 VA=1KVA, 1000 KVA =1000 MVA=1GVA

(VA=oksYV ,Eih;j] KVA=fdyksoks ,Eih;j] MVA=esxkoksY ,Eih;j]

GVA=fxxkoksYV ,Eih;j $\frac{1}{2}$

5- izR;{k ÅtkZ $\frac{1}{4}$,ijsUV ,uthZ $\frac{1}{2}$ ^ ls vfHkizsr gS le; ds lkis{ k izR;{k 'kfDr dk vfHkUu

- $\frac{1}{4}17\frac{1}{2}$ bZV $\frac{1}{2}$ ^ ls vfHkizsr gS] og fcUnq ftl ij
mi;ksxdrkZ vkSj@;k mRiknu la;=ksa ds midj.k jkT;karfjd
ikjs"k.k iz.kkyh ls tqMs gks(
 $\frac{1}{4}18\frac{1}{2}$,xzhesaV $\frac{1}{2}$ ls vfHkizsr gS] jkT;
ikjs"k.k miØe] jkT;karfjd ikjs"k.k vuqKflr/kkj] jkT;
ikjs"k.k miØe ds vykok $\frac{1}{4}$;fn dksbZ gks $\frac{1}{2}$ vkSj ,sls fdlh O;fDr ds e/; tks
fdlh la;kstu ls lacaf/kr vkSj@vFkok jkT;karfjd ikjs"k.k iz.kkyh ds mi;ksx
ds ckjs esa vuqca/k(
 $\frac{1}{4}19\frac{1}{2}$ daV^aksy ,fj;k daT;wej $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ ls vfHkizsr gS] ,d
mRiknu dsUnz tks vkbZ-.l-Vh-.l- ls la;ksftr gS vFkok tks vkbZ-.l-
rkRdkfyd $\frac{1}{4}$ fj;y VkbZe $\frac{1}{2}$ fuxjkuh]
vuqlwphdj.k] izs"k.k fu;a=.k] ÅtkZ ys[ksa vkfn dh dksbZ xfrfof/k
vkbZ-bZ-th-lh- ds izko/kkuksa ds vuqlkj ,l-,y-Mh-lh- }kjk fu"ikfnr dh
tkrh gS(
 $\frac{1}{4}20\frac{1}{2}$,y-^ ls vfHkizsr gS] jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ ds :i
esa dk;Zjr~ NRrhlx<+ LVsV ikWoj V^akalf'e'ku daiuh fyfeVsM (
 $\frac{1}{4}21\frac{1}{2}$ ekax& tc rd fd vU;Fkk u dgk tk,] ^ekax^
MWesa izfrfØ;k'khy 'kfDr MWaresa vkSj izR;{k 'kfDr MVA, esa(
 $\frac{1}{4}22\frac{1}{2}$ ^lead vtZu iz.kkyh $\frac{1}{4}$ MkVk ,Doht+h'ku flLVe $\frac{1}{2}$ ^
fjys@midj.kksa }kjk le; ij dh xbZ dk;Zokgh ds Øe dk vfHkys[ku] rFkk
iwoZ
p;fur fcUnqvksa dh tkudkj dh iqu% izn'kZu miyC/k dj;k;k tkos(
 $\frac{1}{4}23\frac{1}{2}$ fjys^ ls vfHkizsr gS] ,slk fjys tks le; ds lkis{k iz.kkyh vko`fRr ds
ifjorZu dh nj ds fofufnZ"V lhek ls mPprj gks tkus ij dk;Z'khy gks vkSj
yksM
'ksfMax izkjaHk djs(
 $\frac{1}{4}24\frac{1}{2}$ ^izs"k.k funZs'k $\frac{1}{4}$ fMLisp baLV^aD'ku $\frac{1}{2}$ ^ ls vfHkizsr gS] ,l-,y-
Mh-lh- }kjk fxzM dksM dh
izs"k.k vuqlwph dh izfØ;k ds vuqlkj ,l-th-,l- $\frac{1}{4}$ jkT; mRiknu dsUnz $\frac{1}{2}$ o
vkbZ-,u-
,l-th-,l- $\frac{1}{4}$ jkT;karfjr mRiknu dsUnz $\frac{1}{2}$ }kjk mRikfnr fo|qr ds izs"k.k gsrq
vkSj forj.k
dEiuh rFkk cMs+ miHkksDrk dks vkgj.k gsrq fn, x, funsZ'k(
 $\frac{1}{4}25\frac{1}{2}$ ^forj.k dEiuh^ $\frac{1}{4}$ fMLdkWe $\frac{1}{2}$;k;k;k;k ^f^f^f^forj.k vuqKflr/kkj]^
/kkik 12 ds v/khu ea[r% folar ds fori.k vkSi vkiwfrZ ds O:olk: gsra
,slh dEiuh tks] vius vkiwfrZ {ks= esa ,slk dk;Z djrh gks(
 $\frac{1}{4}26\frac{1}{2}$ ^forj.k iz.kkyh^ ls vfHkizsr gS] ikjs"k.k ykbZuksa ds iznk;
fcUnqvksa vFkok mRiknu dsUnz
ls la;kstu] fcUnq tSlk Hkh izdj.k gks vkSj miHkksDrkvksa ds
izfr"Bkiu ds la;kstu

fcUnq ds chp dh rkjksa vkSj lg;ksftr lqfo/kkvksa dh iz.kkyh (
 $\frac{1}{4}27\frac{1}{2}$ $\frac{1}{4}fMLisp$ 'ksM~;wy $\frac{1}{2}$ ls vfHkizsr gS] jkT; mRiknu
 dsUnz@jkT;karfjd
 mRiknu dsUnz vuqlwph tks fd le;≤ ij fxzM dks fu;kZr dh tk,xh(
 $\frac{1}{4}28\frac{1}{2}$ $\frac{1}{4}M^aky$ 'ksM~;wy $\frac{1}{2}$ ls vfHkizsr gS] jkT; mRiknu
 dsUnz@jkT;karfjd
 mRiknu dsUn ls mRiknu dsUnzokj] ÅtkZ la;a= ls vkgj.k vkSj
 jkT;karfjd vksiu
 ,Dlsl $\frac{1}{4}varj.k$ V^akatsD'ku $\frac{1}{2}$ ds ifj.kkeLo:i jkT; fxzM ls vkgj.k dh
 vuqlwph (
 $\frac{1}{4}29\frac{1}{2}$ sZl fjdkMZj $\frac{1}{2}$ ^ ls vfHkizsr gS] fdlh ?kVuk fo'ks"k
 ds nkSjku
 iz.kkyh ekin.Mksa ds iwoZ p;fur la[;kRed $\frac{1}{4}fMthVy\frac{1}{2}$ vkSj rRleku
 $\frac{1}{4},uky\frac{1}{2}$ ewY;ksa
 ds O;ogkj dks vfHkysf[kr djus gsrq miyC/k dj;k x;k lk/ku(
 $\frac{1}{4}30\frac{1}{2}$ ^vkgj.k $\frac{1}{4}M^aky\frac{1}{2}$ ^ ls vfHkizsr gS] jkT;karfjd ikjs"k.k iz.kkyh ls
 fo|qr dk vkgj.k
 $\frac{1}{4}ysuk\frac{1}{2}$ (
 $\frac{1}{4}31\frac{1}{2}$ ^?kVuk $\frac{1}{4}bosUV\frac{1}{2}$ ^ ls vfHkizsr gS] fdUgha nks"kkSa]
 ?kVukvksa vkSj $\frac{1}{4}czsd$ Mkm $\frac{1}{2}$ ds izlaxks
 lfgr jkT;karfjd ikjs"k.k iz.kkyh esa ?kfVr vukf/klwfpr ;k vfu;ksftr
 dksbZ ?kVuk(
 $\frac{1}{4}32\frac{1}{2}$ ^?kVuk lwpd lqfo/kk $\frac{1}{4}bosUV$ ykWfxax QSflfyVh $\frac{1}{2}$ ^ ls
 vfHkizsr gS] ,slk lk/ku] tks ?kVuk
 ds le; fjys o vU; midj.kksa }kjk dh xbZ dk;Zokgh dk Øekuqlkj
 vfHkys[ku
 djsa(
 $\frac{1}{4}33$ vfr mPp oksYVst $\frac{1}{4}bZ,pOgh\frac{1}{2}$ ^ ^ ^ ^ ls
 $\frac{1}{2}$ vfHkizsr gS] lkekU; ifjLFkfr esa 33 ds-Ogh- ls mPprj oksYVst(
 ^nks"k 'kks/kd $\frac{1}{4}OkYV$ vksdsVi $\frac{1}{2}$ ^ ls vfHkizsr gS] ikis"k.k rki ds
 ,slk lk/ku tks og nwjh] tgka ij fd rkj esa dksbZ nks"k fufeZr gqv k gks]
 ukus ;k
 bafxr djus gsrq LFkkr fd;k x;k gks(
 $\frac{1}{4}35\frac{1}{2}$ ^izR;korhZ /kkjk ds yphys ikjs"k.k^ ;k ,Q-,-lh-Vh- ls vfHkizsr
 gS] os lqfo/kk,a] tks , -
 lh- ykbZuksa esa fo|qr izokg dks fofu;fer djus] nks"ktU; izokg o rkjksa
 eas Hkkj
 bR;kfn dks fu;af=r djus leFkZ gks(

$\frac{1}{4}36\frac{1}{2}$ $\wedge$ mRiknu la;a= $\frac{1}{4}$ tujsfVax IykaV $\frac{1}{2}\wedge$ ls vfHkizsr gS] jkT; iz.kkyh
ls la;ksftr dksbZ

fo|qr mRiknu dsUnz] ftlesa dsfIVo mRiknu la;a= Hkh 'kkfey gS lkFk
gh vkbZ-bZ-th-

lh- esa izko/kkuksa ds vuqlkj ,l-,y-Mh-lh- ds fu;a=.k {ks= ds varxZr
vkus okys fo|qr mRiknu la;a= rFkk lh-th-ih Hkh 'kkfey gS(

$\frac{1}{4}37\frac{1}{2}$ grk $\wedge$ ls vfHkizsr gS] NRRhlx<+ jkT; fxzM lafgrk] 2011(

$\frac{1}{4}38\frac{1}{2}$ $\frac{1}{2}$;k mPp oksYVst $\frac{1}{4}$,p Ogh $\frac{1}{2}\wedge$ ls rkRi;Z gS lkekU;
ifjLFkfr esa 650 oksYV ls vf/kd rFkk 33 ds-oh- oksYV rd dh

oksYVst] $\frac{1}{4}39\frac{1}{2}$ $\wedge$ Hkkjrh; fo|qr fxzM lh- $\wedge$ ls vfHkizsr gS]
dsUnzh; vk;ksx }kjk vf/kfu;e dh /kkjk 79 dh mi/kkjk $1\frac{1}{4}$,p $\frac{1}{2}$ ds rkjrE; esa
fofufnZ"V dh xbZ dsUnzh; fxzM lafgrk(

$\frac{1}{4}40\frac{1}{2}$ $\wedge$ varj jkT;h; mRiknu dsUnz ;k vkbZ

dsUnz vFkok vU; mRiknu dsUnz ftlesa nks ;k vf/kd jkT;ksa dh
va'k/kkfjrk gS(

$\frac{1}{4}41$,l- $\wedge$ $\wedge$ $\wedge$ $\wedge$ ls vfHkizsr gS]

$\frac{1}{2}$ dsfIVo mRiknu la;a= lfgr dksbZ mRiknu dsUnz tks ek= jkT; fxzM
ls la;ksftr gS(
vfHkizsr gS] fo|qr ds izog.k ds fy, jkT; ds {ks= ds Hkhrj ikjs"k.k
rkjksa dk dksbZ ra= blesa jkT; ds vuqKfIr/kkjh ds lHkh ikjs"k.k rkj]
midsUnz vkSj mlls layXu midj.k Hkh lfEefyr gaS(

$\frac{1}{4}43\frac{1}{2}$ $\wedge$ jkT;karfjd mi;ksxdrkZ $\wedge$ ls vfHkizsr gS] ,d O;fDr] tSlS ,d
mRiknu daiuh ftlesa dsfIVo mRiknu la;a= Hkh lfEefyr gS vFkok
ikjs"k.k vuqKfIr/kkjh $\frac{1}{4}$ jkT; ikjs"k.k miØe vkSj dsUnzh; ikjs"k.k miØe dks
NksM+dj $\frac{1}{2}$ vFkok forj.k vuqKfIr/kkjh vFkok dsfIVo mi;ksxdrkZ cM+s
miHkksDrk] ftldk fo|qr la;a= 33 ds-Ogh- vkSj mlls vf/kd ds oksYVst Lrj ij
jkT; fxzM ls la;ksftr gS(

$\frac{1}{4}44$ fuEu nkc $\frac{1}{4}$,y-VhVhVhVh- $\frac{1}{2}$;k

$\frac{1}{2}$ fuEu oksYVst $\frac{1}{4}$,y
vkSj mlls de dk oksYVst(
lkekU;r% esxk okV esa fu/kkZfjr iw.kZHkkj mRiknu {kerk] tks
fofufnZ"V ifjLFkfr;ksa es Hkh fujarj cuh jgsa(

$\frac{1}{4}46\frac{1}{2}$ ekWx $\wedge$ ls vfHkizsr gS] miHkksDrk dks iznk; fcUnq ij
CykWd varjky vFkok LYkbbfMax foaMks ekiu ds fl)kar ls ifjdfyr] ekg ds
nkSjku 15 feuV dh fdLh ØeorhZ vof/k esa ifjnRr vkSlr ds-Ogh,- ds vf/kdre
ewY; dk pkj xquk(

$\frac{1}{4}47\frac{1}{2}$ $\wedge$ lapkyu $\frac{1}{4}$ vkij's'ku $\frac{1}{2}$ $\wedge$ ls vfHkizsr gS] fdLh ra= ds lapkyu ls
lacaf/kr dksbZ vuqlwfp ;k LFkkfir dk;Zokgh(

$\frac{1}{4}48\frac{1}{2}$ $\wedge$ eqDr mi;ksx fofu;e $\frac{1}{4}$ vksiu ,Dlsl jsX;wys'ku $\frac{1}{2}\wedge$ ls vfHkizsr gS] NRrhlx<+ jkT; fo|qr fu;ked vk;ksx $\frac{1}{4}$ la;kstdrk o jkT;karfjd eqDr mi;ksx $\frac{1}{2}$ fofu;e 2011(

$\frac{1}{4}49\frac{1}{2}$ $\wedge$ pjekof/k $\frac{1}{4}$ ihd ihfj;M $\frac{1}{2}\wedge$ ls vfHkizsr gS] fdlh fnu ds og vof/k tc fo|qr dh ekax vius mPpre Lrj ij gks vFkok vk;ksx }kjk tSlk funsZfkr fd;k tk,(

$\frac{1}{4}50\frac{1}{2}$ vkmVst $\frac{1}{2}\wedge$ ls jkT; {ks= ds mRiknu dsUnz dh bdkbZ ds laca/k esa vfHkizsr gS] fo|qr dsUnz bdkbZ dh vkGj.k] vkSj ikjs"k.k lqfo/kk ds laca/k esa vfHkizsr gS ikjs"k.k rkjksa vkSj midj.kksa dh fudklh tks fd vfxze :i ls fdlh o"kZ ds nkSjku ;ksftr vkSj jkT; Hkkj iza"k.k dsUnz ls lger gks(

$\frac{1}{4}51\frac{1}{2}$ rfØ;k'khy ÅtkZ $\frac{1}{4}$ fj,fDVo ,uthZ $\frac{1}{2}\wedge$ ls vfHkizsr gS] le; ds lkis{k izfrfØ;k'khy 'kfDr dk vfHkUu HkkxA ;g fj,fDVo oksYV ,Eih;j ?kaVs ;k bls ekud xq.kdksa esa ekik tkrk gS tSls&

1000VArh=1kVArh, 1000kVarh=1MVarh, 1000MVarh=1GVArh

(VArh=oksYV ,Eih;j fj,fDVo ?kaVs] KVarh=fdyks oksYV ,Eih;j fj,fDVo ?kaVs]

MVarh=esxk oksYV ,Eih;j fj,fDVo ?kaVs] GVArh= xhxx oksYV ,Eih;j fj,fDVo ?kaVs $\frac{1}{2}$

$\frac{1}{4}52\frac{1}{2}$ oj $\frac{1}{2}\wedge$ ls vfHkizsr gS] fj,fDVo oksYV ,Eih;j vkSj muds ekud xq.kdksa esa ekih xbZ Qst+ oksYVst ,oa Qst+ fo|qr /kkjk ds e/; dks.k dh T;k dk xq.kuQy tSls&

1000VAr=1kVAr, 1000kVar=1MVar, 1000MVar=1GVAr

(VAr=oksYV ,Eih;j fj,fDVo] KVar=fdyks oksYV ,Eih;j fj,fDVo]

MVar=

esxkoksYV ,Eih;j fj,fDVo] GVAr= fxxk oksYV ,Eih;j fj,fDVo $\frac{1}{2}$

$\frac{1}{4}53\frac{1}{2}$ axy ykbZu Mk;xzke $\frac{1}{2}\wedge$ ls vfHkizsr gS] ,slh vkd' fr tks mPp nkc@vfr mPpnkc midj.kksa vkSj lHkh ckg~; lfdZVksa] ftlesa mudk vadu] ukedj.k vkSj lwph yxkuk Hkh lfEefyr gS] dks fdlh la;kstu fcUnq ij ;kstuke) <ax ls la;kstu iznfkZr djrh gks(

$\frac{1}{4}54\frac{1}{2}$ s[kkfp= $\frac{1}{4}$ lkbZV dkWeu M^akbaZx $\frac{1}{2}\wedge$ ls vfHkizsr gS] izR;sd la;kstu fcUnq ds fy, rS;kj fd;k x;k ,slk js[kkfp=] ftlesa ys vkmV js[kkfp= fo|qrh; ;kstuk ds js[kkfp=] lkekU; lqj {kk@fu;a=k ds js[kkfp= vkSj lkekU; lsokvksa ds js[kkfp= Hkh lfEefyr gS(

$\frac{1}{4}55\frac{1}{2}$ toZ $\wedge$ ls vfHkizsr gS] fdlh mRiknu daiuh dh og vkjf{kr {kerk] tks fd vkaf'kd :i ls bruh gh Hkkfjr gks] iz.kkyh ls tqM+h gks vkSj iza"k.k funsZ'kksa ds vuqlj.k esa vYikof/kd lpuk ij ;k vko'fr&ikr de gksus dh izfrfØ;k esa rRdky mRiknu o'f) miyC/k djkus rS;kj gks(

- 1/456 lh-^ ^ ^ ^ ls vfHkizsr gS] og dsUnz
 1/2 tks vf/kfu;e dh /kkjk 39 mi/kkjk 1/41 1/2 ds v/khu LFkkfir fd;k x;k gks(
 ^ikT: Hkki izs"k.k midsUnz :k .l-.l
 vuq'khyu ,oa fu;a=.k ds fy, jkT; Hkkj izs"k.k dsUnz ds eq[;ky; ds
 vfrfjDr vU; LFkkuksa ij LFkkfir mlds dk;kZy; vkSj vU; layXu
 lqfo/kk,a(
- 1/458 ,l-^ ^ ^ ^ ls vfHkizsr gS] jkT; ljdkj]
 1/2 fu;af=r vFkok mlds LokfeRo dh fdlh daiuh }kjk /kkfjr dksbZ fo|qr
 mRiknu dsUnz(
 ds v/khu jkT; ljdkj }kjk ljdkjh daiuh ds :i esa fofufnZ"V miØe(
- 1/460 1/2 vkj {kfriwjd 1/4LVsfVd Ogh,vkj dEisulsV
 lqfo/kk tks izfrfØ;k'khy 'kfDr ds mRiknu ;k vo'kks"k.k ds mn~ns'; ls
 fofufeZr dh xbZ gks(
- 1/461 1/2 ^i;Zos{k.kh; fu;a=.k ,oa lead vtZu vFkok ,l-lh
 V^akalM~;wllZ] nwjLFk VfeZuy bdkbZ lalwpuk dh dM+h vkSj lead
 laj{k.k iz.kkyh vof/k dk ;qXe] tks jkT; ikjs"k.k iz.kkyh dh lapkyu fLFkfr
 ij jkT; Hkkj izs"k.k dsUnz dks tkudkj miyC/k djkrk gS(
- 1/462 1/2 ksukbt^{1/2}^ ls vfHkizsr gS] og fLFkfr tgkW dksbZ
 varjxrk mRiknu bdkbZ ;k iz.kkyh fdlh nwljh iz.kkyh ls tqM+rh gS ftlls fd
 mRiknu bdkbZ ;k iz.kkyh tSlk Hkh izdj.k gks] dk oksYVst] vko`fRr vkSj
 Qst laca/k ml iz.kkyh ds]
 ftlls la;ksfr gksrk gS] ls ,d tSlgs gksA mnuqlkj] flUØksukbt o
 flUØksukbts'ku dk rkRi;Z gksxk(
- 1/463 1/2 d^{1/2}^ ls vfHkizsr gS] 15 feuVksa dh ,slh vof/k ftlds
 nkSjku ÅtkZ ekid ehVj fofufnZ"V fo|qr ekinaM ntZ djsaA bl
 le;kof/k ds nkSjku esxkov vFkok ,e-Ogh-,- esa vf/kdre ekax dh eki dk
 vadu djus ds fy, ;k rks le;karjky ;k LykbfMax foUMksa dk fl)kar viuk;k
 tk,xk(
- 1/464 1/2 Doaslh fjys^ ^ ^ ^ ls vfHkizsr gS] ,slh iz.kkyh tks fd vko`fRr
 dh fofufnZ"V lhek rd uhps fxj tkus ij yksM 'ksfMax izkjaHk djus
 mu 'kCnksa ,oa vfHkO;fDr;ksa dk] ftudk iz;ksx bu fofu;eksa esa fd;k x;k gS
 ijUrq mUgsa ifjHkkf"kr ugha fd;k x;k gS] ogh vFkZ gksxk tSlk vf/kfu;e vkSj
 vk;ksx@dsUnzh; vk;ksx }kjk tkjh fd, x, vU; fofu;eksa esa gSA
- 1-4 vU; lafgrkvksa dh iz;ksT;rk vkfn%
- 1- ;g lafgrk NRrhlx<+ jkT; fo|qr iznk; lafgrk] NRrhlx<+ jkT; fo|qr fu;ked
 vk;ksx la;kstdrk vkSj jkT;karfjd eqDr mi;ksx fofu;e 2011] o vf/kfu;e ds
 vU; lqlaxr izko/kkuksa] rFkk dsUnzh; fo|qr izkf/kdj.k }kjk tkjh vkSj
 muds varxZr cuk, x, fu;e vkSj fofu;eksa esa la'kks/ku lfgr i<+h tk,xhA

- (i) dsUnzh; fo|qr izkf/kdj.k ¼ehVjksa dk izfr"Bkiu vkSj lapkyu½ fofu;e] 2006
- (ii) dsUnzh; fo|qr izkf/kdj.k ¼ehVjksa dk izfr"Bkiu vkSj lapkyu½ la'kks/ku fofu;e] 2010
- (iii) dsUnzh; fo|qr izkf/kdj.k ¼fxzM dh la;kstdrk ds fy, rduhdh eku n.M½ fofu;e] 2007
- (iv) dsUnzh; fo|qr izkf/kdj.k ¼fo|qr x`gksa vkSj fo|qr ykbZuksa ds fuekZ.k] lapkyu vkSj la/kkj.k gsrq laj {kk vko';drk,a½ fofu;e] 2008
- (v) dsUnzh; fo|qr izkf/kdj.k ¼fo|qr iznk; vkSj laj {kk laca/kh mik;½ fofu;e] 2010
- (vi) dsUnzh; fo|qr izkf/kdj.k ¼fxzM ekun.M½ fofu;e] 2010
- (vii) dsUnzh; fo|qr izkf/kdj.k ¼fo|qr x`gksa rFkk fo|qr ykbZuksa ds fuekZ.k gsrq rduhdh ekun.M ½ fofu;e] 2010
- (viii) dsUnzh; fo|qr izkf/kdj.k¼fo|qr x`gksa rFkk fo|qr ykbZuksa ds fuekZ.k] lapkyu rFkk la/kkj.k gsrq laj {kk vko';drk,a½ fofu;e] 2011

2- tgka dgha bl lafgrk dk dksbZ izko/kku vf/kfu;e ds rFkk mlds varxZr fufeZr fu;e vFkok fofu;eksa ls vlaxr ik;k tkrk gS] ogka ,slh vlaxfr dks NksM+ dj] lafgrk ds izko/kku izpyu esa jgsaxsA

3- tgka dgha bl lafgrk ds fdlh izko/kku dh iz;ksT;rk vFkok fuoZpu ds laca/k esa dksbZ fookn gks rks mls vk;ksx dks lanfHkZr fd;k tk,xk] ftdk fu.kZ; nksuksa lacaf/kr i {kksa ij vafre vkSj ca/kudkjH gksxkA

4- tgka dgha fo|qr vf/kfu;e] 2003 ds lkjka'k mYysf[kr fd, tkrs gSa] ogka ewy vf/kfu;e esa fd, x, dksbZ ifjorZu@la'kks/ku Loeso bl lafgrk ds varxZr Hkh izHkko'khy gq, ekus tk,axsA

5- ,sls leLr miHkksDrk tks jkT; ikjs"k.k iz.kkyh ls la;ksfr gS vkSj@mldk mi;ksx dj jgs gaS] lqlaxr fofu;eksa dk vuqiky djsaxs vkSj NRrhlx<+ jkT; fo|qr fu;ked vk;ksx ¼jkT;karxZr ,chVh] xSj vuqlwfpr laifjorZuh; izHkkjksa vkSj lacaf/kr fo"k;ksa½ fofu;e tks fd vf/klwfpr fd, tkus gSa vkSj mlesa gksus okys la'kks/kuksa dk vuqiky djsaxsA

1-5 NRrhlx<+ jkT; fo|qr fxzM lafgrk] 2011

bl jkT; fxzM lafgrk esa fuEufyf[kr v;/k; gksaxs]

vFkkZr%&

k& bl v;/k; esa fxzM lafgrk dk izkjafHkd Hkkx vkSj lafgrk esa iz;qDr dh xbZ 'kCnkoyh ls lacaf/kr ifjHkk"kk,a nh xbZ gSa(

% lkekU;& ;g Hkkx eq[;r% bu fofu;eksa ds {ks=} iz;ksT;rk rFkk fxzM iqujh{k.k lfefr ls lacaf/kr gS(

;kstuk lafgrk& ;g lafgrk] fla)krksa] izfØ;kvksa rFkk jkT;karfjd ikjs"k.k
iz.kkyh dh ;kstuk rFkk fodkl dks fofufnZ"V djrh gS(

vkSj ekun.M& la;kstdrk dh n'kk,a tks U;wure
rduhdh rFkk :ikadu ekin.Mksa dks fofufnZ"V djrh gS rFkk ftUgsa jkT;karfjd
ikjs"k.k iz.kkyh ls la;ksftr vFkok la;kstu pkgus ds bPNqd fdLh ikjs"k.k
vuqKfIr/kkjH vkSj miHkksDrk }kjk vuqiky dh vko';d gksxA

v/;k;&5% lapkyu lafgrk& ;g lafgrk mu n'kkvksa dk o.kZu djrh gS ftuds
varxZr jkT; Hkkj izs"k.k dsUnz jkT;karfjd ikjs"k.k iz.kkyh esa dk;Z djsaxs
vkSj ftuds varxZr jkT;karfjd miHkksDrk viuh lsokvksa dsk lapkfyr djsaxs]
tgkW rd ,slk djuk jkT;karfjd ikjs"k.k iz.kkyh dh lqj{kk ds la/kkj.k vkSj
xq.korkiw.kZ iznk; rFkk lqj{kr lapkyu ds fy, vko';d gksA

rFkk izs"k.k lafgrk& bl lafgrk esa NRrhlx<+ jkT; ds fy,
vuqlwphdj.k vkSj izs"k.k lafgrk ds fodkl ls lacaf/kr izko/kku lfEefyr gSaA

lafgrk& bl v/;k; esa jkT; ikjs"k.k iz.kkyh ls la;ksftr ikjs"k.k
ykbZuksa ds fy, viukbZ tkus okyh lqj{kk jhfr ds ckjs esa fn;k x;k gSA

ehVfjax lafgrk& bl v/;k; esa jkT; fxzM ls la;ksftr ikjs"k.k iz.kkyh
esa iz;qDr dh tkus okyh ehVfjax jhfr ds ekud rduhdh fofunZs'k fn, x, gSaA

$\frac{1}{4}$ dafVutsalh Iykfuax $\frac{1}{2}$ & bl v/;k; esa jkT; fxzM ls
la;ksftr gFLr;ksa $\frac{1}{4}$,UVkbZVht+ $\frac{1}{2}$ }kjk ikjs"k.k iz.kkyh dh iw.kZ vFkok
vkaf'kd fudklh $\frac{1}{4}$ vkMvst $\frac{1}{2}$ dh n'kk esa viuk,a tkus okyh vkdfLed ;kstuk dh
:ijs[kk nh xbZ gSA

j{kk ekud& bl v/;k; esa jkT; fxzM ds lapkyu esa viukbZ tkus
okyh lqj{kk ekudksa dk fooj.k gSA

lapkyu ij ?kVuk vkSj balhMsaV fjiksZfVax& bl v/;k; esa jkT;
fxzM ls lacaf/kr gFLr;ksa $\frac{1}{4}$,UVkbZVht+ $\frac{1}{2}$ }kjk lapkyu ds rkSj&rjhdksa vkSj
iz?kVuk izfrosnu ds laca/k esa o.kZu fd;k x;k gSA

MkVk iath;u& jkT; fxzM ds leLr mi;ksxdrkZvksa dks leqfpr
MkVk ekiu vkSj jkT; ikjs"k.k bdkbZ dks MkVk laizs"k.k gsrq mRrjnk;h
cuk;k x;k gSA bl v/;k; esa bUgha eqn~nksa dk o.kZu fd;k x;k gSA

fofo/k& bl Hkkx esa jkT; fxzM lafgrk ds vuqiky] la'kks/ku dh
'kfDr] dfBukbZ;ksa dks nwj djus dh 'kfDr rFkk fooknksa ds fuiVkj vkfn dk
vusd fofo/k igyqvksa dk mYys[k gSA

&&000&&

v/;k;&2

lkekU;

2-1 fofu,e dk {ks= vkSj iz;ksT;rk dk foLrkj%

2-1-1 ;s fofu,e fuEufyf[kr dks iz;ksT; gksaxs&

(i) jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh;-w- $\frac{1}{2}$ lfgr jkT; ds izR;sd ikjs"k.k
vuqKfIr/kkjH(

- (ii) jkT; Hkkj izs"k.k dsUnz(
- (iii) izR;sd ,slk mi;ksxdrkZ tks jkT;karfjd ikjs"k.k iz.kkyh ls la;ksftr gS vkSj@vFkok mldk mi;ksxdrkZ gS(
- (iv) jkT;karfjd ikjs"k.k iz.kkyh ls la;ksftr vkSj@vFkok mldk mi;ksx djus okys leLr mi;ksxdrkZvksa ij ;g lafgrk@Hkkjrh; fo|qr fxzM lafgrk] tgkW rd os ,sls mi;ksxdrkZ ij ykxw gSa] esa ifjHkkf"kr fl)kar vkSj izfØ;k,a] vke)dkjh gaS A

2-1-2 jkT;karfjd ikjs"k.k iz.kkyh ds Hkkx ds :i esa ikjs"k.k vuqKflr/kkj] vkSj miHkksDrk ftuds ikl jkT;karfjd ikjs"k.k iz.kkyh ds la;kstu gSa mUgSa bu fofu;eksa ds varxZr fuEufyf[kr okaNkvksa dh iwfrZ djuk pkfg,&

- (i) v;/k;&4 ds vuqlj.k esa la;kstu vuqca/k djsa(
- (ii) v;/k;&7 ds vuqlj.k esa lqj {kk iz.kkfy;ka miyC/k djka(
- (iii) v;/k;&4 ds vuqlj.k esa lapkj lqfo/kk,a miyC/k djka vkSj VsyhehVjh okaNkvksa dh iwfrZ djsa(
- (iv) v;/k;&12 ds vuqlj.k esa vfHkys[k midj.k iz.kkyh miyC/k djka(
- (v) v;/k;&4 ds vuqPNsn 4-8-2 ds vuqlj.k esa ,djs[kh; fp=a.k $\frac{1}{4}$ Mk;xzke $\frac{1}{2}$ fodflr djsa(
- (vi) v;/k;&4 ds vuqPNsn 4-8-3 ds vuqlj.k esa lkbZV dkWeu M^akbZax rFkk LFky mRrjnkf;Ro vuqlwph fodflr djsa(
- (vii) v;/k;&8 ds vuqlj.k esa ehVjksa dk izfr"Bkiu vkSj lapkyu] ehVfjax lafgrk ds vuq;i fodflr djsa(

2-2 NRrhlx<+ jkT; fo|qr fxzM lafgrk&2011 dh miyC/krk&

vk;ksx] jkT; Hkkj izs"k.k dsUnz vkSj jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ viuh oselkbZV ij jkT; fxzM lafgrk&2011 dks iznf'kZr djasxa jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ fdllh Hkh O;fDr dks] tks blds leqfpr eqnz.k ykxw ls vf/kd u gks] ,sls ewY; ij jkT; fxzM lafgrk&2011 dh eqfnzr izfr miyC/k djka,xkA

2-3 $\frac{1}{4}$,l-VhVhVhVh-;w;w;w;w- $\frac{1}{2}$ vkSj jkT; Hkkj izs"k.k dsUnz%

jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ & bl lafgrk ds izca/ku vkSj fØ;kUo;u ds fy, mRrjnk;h jgsxhA jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ vkSj jkT; Hkkj izs"k.k dsUnz vf/kfu;e ds izko/kkuksa rFkk lacaf/kr izkf/kdj.k }kjk tkjh vU; fofu;eksa ds varxZr vius mu dk;ksZa vkSj nkf;Roksa dk Lora= :i ls vkSj viwokZxzgh rjhds ls ikyu djsaxsA mi;qZDr ds lkFk&lkFk jkT; Hkkj izs"k.k dsUnz jkT; ;w-vkbZ- iwy [kkrs ds lapkyu] jkT; izfrfØ;k'khy ÅtkZ [kkrs rFkk datsD'ku izHkkj [kkrs vkfn ds lapkyu ds fy,] lqlaxr fofu;eksa ds vuqlkj mRrjnk;h gksxkA ijUrq jkT; Hkkj izs"k.k dsUnz ds jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ }kjk lapkfyr fd, tkus dh n'kk esa vf/kfu;e dh /kkjk 31 dh mi/kkjk $\frac{1}{2}$ ds izFke izko/kku ds vuqlkj jkT; Hkkj izs"k.k

dsUnz dks i;kZlr Lok;Rrrk miyC/k djkbZ tk,xh ftlls og vius dk;ksZa dk mi;ZqDrkuqlkj rjhds ls fuoZgu dj ldsA

2-4 jkT; fxzM leUo;

2-4-1 jkT; fxzM leUo; lfefr fuEufyf[kr lnL;ksa ls fey dj cusxh%&

(i) NRrhlx<+ jkT; ikoj ikjs"k.k daiuh fyfeVsM ds izca/k funs'kd& v/; {k(

(ii) jkT; Hkkj izs"k.k dsUnz ds dk;Zdkjh funs'kd@eq[; vfHk;ark vFkok izHkkjh lnL; lfpo (

(iii) NRrhlx<+ jkT; ikoj mRiknu daiuh fyfeVsM }kjk ukekafdr dk;Zdkjh funs'kd@eq[; vfHk;ark& lnL; (

(iv) jkT; Hkkj izs"k.k dsUnz }kjk ukekafdr ,d izfrfuf/k& lnL; (

(v) forj.k vuqKflr/kkfj;ksa esa ls izR;sd }kjk ukekafdr ,d izfrfuf/k&lnL; (

(vi) jkT; ikjs"k.k miØe $\frac{1}{4}$, l-Vh-;w- $\frac{1}{2}$ dks NksM+dj ikjs"k.k vuqKflr/kkfj;ksa esa ls izR;sd }kjk ukekafdr ,d izfrfuf/k& lnL; (

(vii) NRrhlx<+ jkT; ikoj mRiknu daiuh fyfeVsM ds vykok 500 MWvkSj vf/kd dh izfr"Bkfir {kerk okys mRiknu la;a=] tks jkT; fxzM ls la;ksfr gks dk ,d izfrfuf/k& lnL; (

(viii) mi;qZDr dafMdk $\frac{1}{4}$ vii $\frac{1}{2}$ ls fHkUu fdLh vU; mRiknu la;a=] ;fn dksbZ gks] ds laxBu dk ,d izfrfuf/k& lnL; (

fVli.kh % % % % dafMdk $\frac{1}{4}$ vii $\frac{1}{2}$ vkSj $\frac{1}{4}$ viii $\frac{1}{2}$ esa nf`kZr lnL;ksa dh inkof/k nks o"kZ gksxh A

2-5 5 5 5 lfefr ds d`R; %

2-5-1 jkT; fxzM la;kstu lfefr ds d`R; fuEukuqlkj gksaxs%&

(i) bu fofu;eksa vkSj bu fofu;eksa ds vU; izko/kkuksa ds v/khu fodflr fu;eksa vkSj izfØ;kvksa ds fØ;kUo;u dks lg;ksx nsuk(

(ii) bu fofu;eksa rFkk bu fofu;eksa ds izko/kkukas ds varxZr fodflr fu;eksa vkSj izfØ;kvksa ds izko/kkuksa ds fØ;kao;u ds nkSjku mB ldus okys eqn~nksa dk vkdyu djuk vkSj muds funku ds mik; lq>kuk(

(iii) vf/kfu;e vkSj bu fofu;eksa ds izko/kkuksa ds vuqlj.k esa jkT; fxzM lafgrk dk iqujh {k.k djuk(vkSj vk;ksx dks bu fofu;eksa esa vko';d la'kks/kuksa@ifjorZuksa dk lq>ko nsuk] tks vf/kfu;e ds lez vuqikyus ds fgr esa gksa] ftlls ikoj {ks= dk lqpk: lapkyu fd;k tk lds (

(iv) ,sls ekeyksa dk v/;;u djuk] tks vk;ksx }kjk le;≤ ij funZsfkr fd, tk,a(

2-5-2 lfefr dh cSBd N% ekg esa U;wure ,d ckj gksxhA

2-5-3 lnL; lfpo] lfefr ds le{k fopkj gsrq leLr izLrko izLrqr djsxkA lfefr ds fu"d"kksZa dh tkudkjh vk;ksx dks 15 fnol ds Hkhrj lwfpr dh tkuh pkfg,A

2-5-4 lfefr] lacaf/kr leL;kvksa ds foLr`r v/;;u ds fy, milfebr;ksa dk xBu dj ldsxhA ;s mi&lfefr;ka jkT;karfjd mi;ksxdrkZ vkSj mi;ksxdrkZ ds lewgksa ds lkFk mudh ,dy leL;kvksa ij ppkZ dj ldsaxh vkSj fxzM la;kstu lfefr ds fy, izLrko rS;kj dj ldsaxhA

2-5-5 lfefr dh flQkfj'ksa] fopkj vkSj vuqeksnu ds fy, vk;ksx ds le{k izLrqr dh tk ldsaxhA vk;ksx] Loizsj.kk ls vFkok ,slh lfefr dh vuq'kalkvksa ij] tSlk Hkh og

mfpr le>s] fxzM lafgrk dks la'kksf/kr dj ldsxkA rFkkfi] bl lafgrk esa dksbZ la'kks/ku djus ls iwoZ izLrkfor ifjorZu ds laca/k esa fVlif.k;ka] jkT;karfjd mi;ksxdrkZvksa vkSj turk ls izkIr dh tk,axhA

&&000&&

v;/k;&3

tuk lafgrk

3-1 ikjs"k.k iz.kkyh dh ;kstuk

3-1-1 fo|qr vf/kfu;e 2003 dh /kkjk 39 $\frac{1}{4}2\frac{1}{2}\frac{1}{4}ch\frac{1}{2}$ ds vuqlkj jkT; ikjs"k.k miØe] dsUnzh; ikjs"k.k miØe] jkT; 'kklu] mRiknu daiuh;ka] {ksf=; ikoj lfefr;ka] dsUnzh; fo|qr izkf/kdj.k] vuqKflr/kkjh vkSj ,sls vU; O;fDr tks bl laca/k eas jkT; ljdkj }kjk vf/klwfpr fd, tk,a] tks jkT; ikjs"k.k iz.kkyh ls fo|qr ds vkgj.k ;k fudklh gsrq jkT; ikjs"k.k iz.kkyh dk mi;ksx dj ldrs gSa] ds lkFk jkT; ikjs"k.k iz.kkyh laca/kh ;kstuk vkSj leUo; laca/kh leLr d'R;ksa dk fuoZgu djsxkA

3-1-2 iz.kkyh dh ;kstuk esa] jkT; ikjs"k.k miØe }kjk ;kstuk cukus vkSj ikjs"k.k iz.kkyh ds fodkl gsrq viukbZ tkus okyh rduhd ,oa :ikadu ekin.M rFkk izfØ;k fu/kkZj.k fofufnZ"V gksxkA ikjs"k.k iz.kkyh dk mi;ksxdrkZ] viuh Lo;a dh iz.kkyh dh ;kstuk cukus ,oa mlds fodkl ds laca/k esa] ,slh iz.kkyh dh ;kstuk dk /;ku j[ksxkA jkT; ikjs"k.k miØe] ekax vkSj mRiknu dh vko';drkvksa dh iwfrZ ds Øe esa mi;ksxdrkZvksa dh lykg ls ,d l{ke] lqjf{kr ,oa ferO;;h jkT;karfjd ikjs"k.k iz.kkyh fodflr djsxkA

(i) jkT; ikjs"k.k miØe viuh baVjusV osclkbZV ij jkT;karfjd ikjs"k.k iz.kkyh ds fy, vuqeksfnr ikjs"k.k iz.kkyh ;kstuk dks viyksM djsxkA

(ii) bl iksj"k.k iz.kkyh ;kstuk esa ikap o"kksZa dh fu;a=.k vof/k ls izkajHk gksdj nl o"kksZa rd dh ;kstuk vof/k lfEefyr dh tk,xhA ikap o"kksZa dh fu;a=.k vof/k ds fy, O;kolkf;d ;kstuk vuqeksfnr djkbZ tk,xhA ijorhZ ikap o"kksZa dh ;kstuk vuqekfur gksxh vkSj vk;ksx ds vuqeksnu ds v/khu jgsxhA vuqeksfnr dh xbZ O;kolkf;d ;kstuk dks izfro"kZ iqujh{k fd;k tk,xk vkSj blesa ifjorZu] ifjo/kZu vFkok Qsjeny ds fy, izLrko izfro"kZ ijh{k.k vkSj vuqeksnu gsrq 30 flracj rd izLrqr fd, tk ldsaxsA jkT; ikjs"k.k miØe Hkh viuh vuqekfur ;kstuk esa ifjofrZr vko';drkvksa ds vk/kkj ij ifjorZu] :ikarj.k vkfn dj ldsxk vkSj mUgsa viuh osclkbZV ij viyksM dj ldsxkA

(iii) ikjs"k.k iz.kkyh esa jkT;karfjd mi;ksxdrkZvksa ds ykHk gsrq iz.kkyh dks lqn`<+ djus gsrq izLrkfor jkT;karfjd ikjs"k.k ;kstukvksa dk vk;ksx }kjk vuqeksfnr O;kolkf;d ;kstuk esa] lekos'k fd;k tk,xkA ikjs"k.k iz.kkyh dh ;kstuk esa u dsoy jkT;karfjd ikjs"k.k ykbZuksa ls lacaf/kr tkudkjHk dk lekos'k gksxk] oju V^akalQkeZjksa] dsisflVjksa] fj;sDVjksa] LVsfVDl oh,-,vkj- dEisulsVjksa vkSj ¶ysfDlcy ,-lh- ikjs"k.k iz.kkfy;ksa lfgr vfrfjDr midj.kksa dk lekos'k Hkh gksxk(lkFk gh ;g Hkh fd ,slh

ikjs"k.k iz.kkyh ;kstuk esa jkT;karfjd ikjs"k.k vkSj iz.kkyh dks lqn`<+
djus okyh ;kstuk ij gqbZ izxfr dh tkudkjH dks Hkh lfeefyr fd;k tk,xkA

3-1-3 jkT; ikjs"k.k miØe }kjk forj.k@ikjs"k.k vuqKflr/kkjH dks ikjs"k.k iz.kkyh
;kstuk ds izk:i miyC/k dj, tk,axs vkSj mUgsa jkT; ikjs"k.k miØe dh
osclkbZV ij Hkh miyC/k dj;k tk,xkA

3-1-4 jkT; ikjs"k.k iz.kkyh ds iquiZzorZu ;k foLrkj dh vko';drk dbZ dkj.kksa ls
mn~Hkwr gks ldrh gS] ftlesa ls dqN fuEufyf[kr gSa %&

- (i) jkT; ikjs"k.k iz.kkyh ls iwoZ esa gh tqM+s gq, mi;ksxdrkZ dh iz.kkyh
dk fodkl A
- (ii) mi;ksxdrkZ dh iz.kkyh vkSj jkT; ikjs"k.k iz.kkyh ds chp u, la;kstu
fcUnq dh 'kq;vkr A
- (iii) izpkyu esa vkus okyh dfBukb;ksa dks nwj djus vkSj lqj {kk ds ekudksa
dks la/kkfjr] djus ds fy, iz.kkyh dh {kerk esa lkekU; o`f)A
- (iv) vYidkfyd&vfLFkj vkSj fLFkj fLFkfr;kaA
- (v) mi;qZDr pkj esa ls fdllh dk vU;ksa ds lkFk lap;h izHkkoA

3-1-5 ikjs"k.k iz.kkyh ds fodkl dh dksbZ vfxze ;kstuk i;kZIr izkjafHkd vof/k dks
/;ku esa j[krs gq, fuEufyf[kr ij fopkj djus ds mijkar gh cukbZ tk,xh %

- (i) foLr`r bathfu;fjax :ikadu vkSj fd, tkus okys fuekZ.k dk;Z gsrq okafNr
le; Kkr fd;k tk,xkA jkT; ikjs"k.k miØe vkSj mi;ksxdrkZ ds e/; tkudkjH
ds vnku&iznku gsrq le;eku ykxw djuk gksxkA tgka dgha leqfpr gks lHkh
lacaf/kkr i {k ,slh tkudkjH dh xksiuH;rk ds lac/ak esa vko';d /;ku j[kksaxsA
- (ii) og le; tks ljdkjH jkti= vkSj vxz.kh lekpj i=ksa esa vf/klwpuk tkjH djus
ikWoj vkSj VsyhdE;qfuds'ku leUo; lfefr dh vuqefr] ou vuqefr] jsYos
vuqefr] ukxfjd mM~;u izkf/kdkfj;ksa ls vuqefr] jk"Vh^a; jktekxZ vkSj
izns'k jktekxksZ vkfn rFkk ekxZ vf/kdkj tSlS dk;ksZa esa yx ldrk gS] dk
Hkh /;ku j[kk tk,xkA

3-2 ifjn`; fu;kstu ¼ijLisfDVo Iyk

3-2-1 iznk; {ks= ds Hkhrj Hkkj iwokZuqeku yxkus dk izkFkfed nkf;Ro] forj.k
vuqKflr/kkfj;ksa dk jgsxkA forj.k vuqKflr/kkjH ikWp o"kZ dh fu;=a.k vof/k]
ftlds fy, jkT; ikjs"k.k miØe vk;ksx ls O;kolkf;d ;kstuk dk vuqeksnu izklr
djsxk] ds izkjaHk ls nl o"kZ ds fy, vius {ks= dk vk/kkj Hkkj] ihd Hkkj vkSj
ÅtkZ dk iwokZuqeku vo/kkfjr djsaxsA bls ckn gksus okys okf"kZd
ifjorZuksa dk MkVk] ;fn dksbZ gks rks jkT; ikjs"k.k miØe dks izfro"kZ
izLrqr djuk gksxkA blesa ekax iwokZuqekuksa] MkVk i)fr vkSj mu
ekU;rkvksa ¼vuqekuksa½ ftu ij os vk/kkfjr gS] dk fooj.k lfEefyr jgsxkA ihd
Hkkj vkSj ÅtkZ dk iwokZuqeku iznk; ds laiW.kZ {ks= ds fy, rS;kj fd,
tk,axsA jkT; ikjs"k.k miØe forj.k vuqKflr/kkjH }kjk Hkkj iwokZuqeku yxkus
dh i)fr rFkk iz;qDr ekU;rkvksa dk muds ijke'kZ ls iqujH{k.k Hkh djsxkA
ifj.kkeLo:i lexx iwokZuqeku ikjs"k.k iz.kkyh ds foLrkj gsrq ;kstuk dk vk/kkj
cusxk] ftls jkT; ikjs"k.k miØe }kjk fØ;kafor fd;k tk,xkA

3-2-2 jkT; ikjs"k.k miØe ikjs"k.k iz.kkyh ds izR;sd la;kstu fcUnq@baVjQsl fcUnq ds fy, okf"kZd ihd yksM dk iwokZuqeku djus ds fy, forj.k vuqKflr/kkjH ds fodkleku Hkkj vkSj fofHkUu mRiknu dsUnzksa dh nh?kZdkfyd vksiu ,Dlsl vko';drkvksa dks /;ku esa j[ksxkA jkT; ikjs"k.k miØe] izR;sd la;kstu fcUnq@baVjQsl fcUnq dh mPp Hkkj vko';drk dks lqfufpr djsxkA ,slk djus ls ikjs"k.k vuqKflr/kkjH dks la;kstu fcUnqvksa@baVjQst fcUnqvksa rd i;kZIr {kerk dh] ikjs"k.k iz.kkyh fodflr djus gsrq vko';d tkudkjH izkIr gksxh] ftlls ikjs"k.k vuqKflr/kkjH dks mi;qDr ikjs"k.k iz.kkyh rS;kj djus esa lgk;rk feysxhA rFkkfi] ;fn forj.k vuqKflr/kkjH fdLh la?kfur {ks= esa vusd la;kstu fcUnqvksa@baVjQsl fcUnqvksa tks ,d eqfnzdk ¼fjaxesUI½ ds :i esa vkil esa tqMs+ gSa] ij ÅtkZ izkIr dj jgk gS rks Hkkj iwokZuqeku esa ikjs"k.k iz.kkyh }kjk fdLh le; fcUnq ij fy, tkus okys vf/kdre Hkkj ds /;ku esa j[kk tkuk pkfg,A bu iwokZuqekuksa dks izfro"kZ vkSj tc dHkh orZeku iz.kkyh esa cMs+ ifjorZu fd, tk,a] v|ru fd;k tk,xkA

3-2-3 jkT; ikjs"k.k miØe Hkfo"; dh ekaxksa dh iwfrZ djus ds fy, jkT;karxZr ikjs"k.k iz.kkyh ds lefUor foLrkj gsrq nh?kZ vof/k ¼nl o"kZ½ dh ;kstuk rS;kj djus gsrq mRrjnk;h gksxkA ,slh ;kstuk esa fuEufyf[kr ckrksa dk /;ku j[kk tk,xk %

- (i) dsUnzh; fo|qr izkf/kdj.k }kjk fojfr ifjn`f"V ;kstuk(
- (ii) dsUnzh; fo|qr izkf/kdj.k }kjk izdkf'kr Hkkjr dk fo|qr ÅtkZ losZ (
- (iii) dsUnzh; fo|qr izkf/kdj.k }kjk tkjh ikjs"k.k ;kstuk ekun.M rFkk ekxZ funsZ'k(
- (iv) vkj-ih-lh-] vkj-,y-Mh-lh- rFkk ,l-,y-Mh-lh- dk lapkyu QhM cSd(
- (v) NRrhlx<+ jkT; fo|qr fu;ked vk;ksx ¼la;kstDrk rFkk jkT;karxZr vksiu ,Dlsl½ fofu;e] 2011] le;≤ ij ;Fkk la'kksf/kr(
- (vi) jkT; esa dksbZ {kerk o`f)(
bl jkT;karxZr lefUor ikjs"k.k ;kstuk esa ikjs"k.k iz.kkyh ds fy, vko';d izfrfØ;kRed {kfriwfrZ ¼fj,fDVo daiuls'ku½ dk Hkh lekos'k gksxkA

3-3 ;kstuk ekun.M rFkk izfØ;k

jkT; ikjs"k.k iz.kkyh dh ;kstuk] dsUnzh; fo|qr izkf/kdj.k }kjk tkjh ^ikjs"k.k ;kstuk ekun.M^ ds vuq:i dh tk,xhA ikjs"k.k iz.kkyh ;kstuk rFkk lqj{kk ekun.M ;kstuk jkT; esa ikjs"k.k iz.kkyh ds foLrkj&dk;Z gsrq ekxZfunZs'kd gSaA nh?kZ vof/k ;kstuk esa fofHkUu mRiknu dsUnzksa ds LokfeRo ls izHkkfor gq, fcuk] muls dh tkus okyh fo|qr fudklh vkSj ykHkkafor gksus okys dks loksZRd`"V :i ls rS;kj dh xbZ ikjs"k.k iz.kkyh }kjk fo'oluh;] lqjf{kr vkSj ferO;;h <ax ls vkiwfrZ iznku djus dk ,d lefUor lksp lfEefyr gSA jkT; fxzM esa fo|qr iz.kkyh bl izdkj fu;ksftr dh tkuh pkfg, ftlls lHkh mRiknu la;a=ksa vkSj foØsrkvksa] if'peh fxzM rFkk dsUnzh; {ks= ds mRiknu dsUnz ls jkT; dks izkIr gksus okyh fo|qr] ;qfDr;qDr vPNh oksYVst] LFkkf;Ro ifjLFkfr;ksa vkSj vkf/kD; ¼fjMUMsUIh½ ekun.M dks cuk, j[krs gq, fcuk

fdlh ck/kk ds fofHkUu ykHkkaforksa rd muds fu;r va'k esa ikjsf"kr dh tk ldsA

ikjs"k.k dh ;g ;kstuk] jkT;] ifpe {ks= vkSj varr% jk"V^ah; fxzM ds fy, ,d lqn`<+] lefUor ikoj iz.kkyyh fodflr djus ds fy, rS;kj dh tk, ftlls miyC/k mRiknu dk vuqdwyre $\frac{1}{4}$ vkIVhekbTM $\frac{1}{2}$ mi;ksx djrs gq, i;kZIr var{kZs=h; varj.k fd, tk ldsA ikjs"k.k ;kstuk }kj fo'oluh;rk ds Lohdk;Z va'k vkSj ;qfDr;qDr ykxr ij ykHkkaforksa gsrq mRd'"V ntZs dh vkiwfrZ Hkh miyC/k djkbZ tk ldsA dlkSVh ;g gksxh fd lqj{kk ekudksa esa Lohd`r fofufnZ"V vkmVst dh fLFkfr esa Hkh fo|qr dk izokg izHkkfor u gks ldsA ikjs"k.k rkjksa o midsUnzksa dh ;kstuk bl izdkj cukbZ tk,xh fd Hkfo"; esa gksus okys Hkkj o`f) gksus ij U;wure vo/kkuksa vkSj ifjektZuksa lfgr mlds mUu;u dk dk;Z fd;k tk ldsA

LVkWd vfHkizkfIr ds le; vkSj laLFkkiu le; esa deh djus ds mn~ns'; ls ikjs"k.k vuqKfIr/kkjH ikjs"k.k rkj ds [kEHkksa] midsUnzksa ds <kapksa] midsUnz ds izdk'k] fu;a=.k d{k ds izdk'k o ok;q lapkj] midsUnz ds Hkw&;kstu gsrq ;FkklaHko ekudhd`r lajpuk] rFkk rkj lkexzh] V<sup>a</sup>kalQkeZjksa] midsUnz ds midj.kksa] dscyksa cl&ckj milk/kuksa bUL;wysVjksa] gkMZos;jksa] ykbVfuax vjsLVj bR;kfn ds fy, ekudhd`r fofufnZ"V;ka viuk;sxxA

ferO;;h ÅtkZ@{kerk fofue; ij fopkj dj tgkW vkfFkZd :i ls laHko gks] jkT; fxzM dk varj jkT;h; fxzM ls mi;qDr la;kstuksa dh laHkkouk ij fopkj fd;k tkuk pkfg,A tgkW dgha vkfFkZd :i ls laHko gks vkSj@;k ubZ ikjs"k.k ykbZu ds fuekZ.k ds fy, xfy;kjs $\frac{1}{4}$ dkjhMksj $\frac{1}{2}$ dh foo'krk gks] FkkbZfjLVj vk/kkfjr fu;a=.kksa] ,p-Ogh-Mh-lh- 'kh?kz fu;a=.k djus ;ksX; Qst ifjorZd bR;kfn ij vk/kkfjr vk/kqfud yphyh ,lh V^akalfe'ku iz.kkyyh ij Hkh fopkj djuk pkfg,A

;kstuk ekun.Mksa ds {ks= esa fuEufyf[kr dk lekos'k gksuk pkfg, %

- (i) iz.kkyyh v/;;u (
- (ii) iz.kkyyh MkVk dk vkdyu (
- (iii) mRiknu miyC/krk dk vkdyu(
- (iv) ;kstuk ekun.M (
- (iv) fofufnZ"V lhek rd fo'oluh;rk gsrq okafNr lqj{kk 'krsZ (
- (vi) midsUnz ;kstuk ds fy, ekun.M(vkSj
- (vii) okafNr izfrfØ;kRed 'kfDr {kfriwfrZ dk vuqeku A

3-3-1 iz.kkyyh dk v/;;u

- (i) fLFkj fLFkfr;ksa $\frac{1}{4}$ Study State Condition $\frac{1}{2}$ esa fofHkUu midsUnzksa ls Hkkj dh vkiwfrZ ?kksf"kr oksYVst dh lhek esa ekU; 50 gV~Zt dh ekU; vko`fRr ij dh tkuh pkfg, vkSj orZeku ifjLFkfr;ksa dk foLr`r v/;;u vkSj Hkkj dk losZ{k.k djus ds mijUr Hkfo"; esa gksus okys Hkkj esa o`f) dk

vkdyu djuk pkfg, A vf/kdre miyC/krk Kkr djus gsrq ikjs" k.k esa gksus okyh gkfu;ksa dk ;qfDr;qDr iwokZuqeku Hkh mlesa 'kkfey fd;k tkuk pkfg,A fuEufyf[kr fo|qr iz.kkyh v/;;uksa ds vk/kkj ij iz.kkyh dk fodkl fd;k tkuk pkfg, %&

$\frac{1}{4}d\frac{1}{2}$ Hkkj izokg

$\frac{1}{4}[k\frac{1}{2}$ fofHkUu ifjflFkfr;ksa esa vf/kdr~e 'kfDr dk izokg

$\frac{1}{4}x\frac{1}{2}$ 'kkVZ lfdZV

$\frac{1}{4}?k\frac{1}{2}$ iz.kkyh dh flFkjrk&flFkj flFkfr;ka

$\frac{1}{4}M-\frac{1}{2}$ iz.kkyh dh flFkjrk&vfLFlkj flFkfr;ka

$\frac{1}{4}p\frac{1}{2}$ fLofpax@vLFkbbZ vf/kd oksYVst Kkr djus gsrq v/;;u

$\frac{1}{4}N\frac{1}{2}$ vU; v/;;u] tSlh vko';drk gks

(ii) bu v/;;uksa ds fy, mi;qDr dEI;wVj dk;ZØeksa dh vko';drk gksrh gSA fdllh ;kstuk vof/k ds izR;sd o"kZ ds fy, fofufpr ykbZuksa] midsUnzksa] fo|eku midsUnzksa esa vfrfjDr V^akalQkeZj bR;kfn ds izkjaHk gksus ds IEHkkfor o"kZ dk vkdyu] mi;qDr :lk ls Kkr lHkh mRiknu vkSj Hkkj clksa lfgr iz'uk/khu o"kZ ds fy, ra=tky ds vk/kkj ij mRiknu ikjs" k.k vkSj Hkkj dks lfEefyr djrs gq, ekWMYl rS;kj fd;s tk,sxsaA iM+kslh jkT;ksa ls 400 ds-Ogh vkSj 220 ds-Ogh- Lrj ij varj la;kstuksa dks Hkh lekfg fd;k tkuk pkfg,A mi;qDr led{k lfdZV ekWMYksa dk mi;ksx la;kstu

fcUnqvksa@lhekUr fcUnqvksa ij nks" k ds Lrj $\frac{1}{4}QkYV$ ysoy $\frac{1}{2}$ dks /;ku esa ysus ds fy, fd;k tk;sxkA iM+kslh ra= tkyksa ds fof'k"V vkSj vko';d Hkkxksa dks ,e-MCY;w- vkSj ,e-Ogh,- vk;kr vkSj fu;kZr ds OkkLrfod Lo:lk esa iznf'Zkr djus ds fy, varlaZ;kstu clksa dks ekWMYl ds :i esa izLrqr fd;k tkosxkA v/;;u mPPre Hkkj vkSj 'kwU; Hkkj nksuksa ifjflFkfr ds fy, fudkyk tk;sxkA

iz.kkyh MkVk $\frac{1}{4}flLVe$ MkVk $\frac{1}{2}$ dk vkdyu&

;qfDr&laxr ifj'kq)rk ds Hkkj iwoZkuqeku rd igWqpus vkSj v/;;u laiUu djus gsrq iz.kkyh leadksa $\frac{1}{4}flLVe$ MkVk $\frac{1}{2}$ dk laxzg.k vkSj $\frac{1}{4}viMs'$ ku $\frac{1}{2}$ vR;ko';d gSA ;kstuk dk v/;;u] fo|eku iz.kkyh ds leqfpr izLrqfrdj.k }kjk vk/kkj fodflr djrs gq, ekWMY ds izek.khdj.k ds lkFk izkjaHk fd;k tkuk pkfg,A fo|eku iz.kkyh ds fy, izklr ifj.kkeksa dks ehVj okpu] midsUnzksa vkSj jkT; Hkkj izs" k.k dsUnz }kjk laxzfgr fd;s x;s vkadM+ksa }kjk lR;kiu fd;k tkuk pkfg,A iz.kkyh ifjekudksa dk uohudj.k] tc dHkh iz.kkyh dk foLrkj ;k vk/kqfudhdj.k fd;k tkos] losZ{k.k }kjk lgh nwjh ,oa yEckbZ vkSj pkyd dh [kkdk $\frac{1}{4}dUQhxjs'$ ku $\frac{1}{2}$ Kkr dj vFkok izFker% tgka dgha vkSj tc dHkh IEHko gks] ykbZu dh bEihMsUl dk eku lh/ks uki dj fd;k tkuk pkfg,A lHkh ra= lead $\frac{1}{4}flLVe$ MkVk $\frac{1}{2}$;kstuk ekudksa vkSj lapkyu ekudksa nksuksa ds fy, leku gksus pkfg,A Hkkjksa dks 220 ds-Ogh vkSj 132 ds-Ogh clksa ij iznf'kZr fd;k

tkuk pkfg,A okf"KZd U;wuRke Hkkj vk/kkj o"KZ esa fo|eku okf"KZd vf/kdre ekax ds izfr'kr ds :lk esa fy;k tkuk pkfg,A

3-3-3 mRiknu miyC/krk dk vkdyu

vf/kdre Hkkj dh fLFkfr ds fy, dbZ mRiknu dsUnzksa ds fofHkUu mRiknuksa ds feJ.k gksus dh n'kk esa visf{kr la;k esa Hkkj izokg v/;;u ;k lqfodflr dEI;wVj lk¶Vos;j iSdstksa dk iz;ksx dj loksZRre vkSlr ykxr Kkr dh tkuh pkfg,A U;wure Hkkj dh fLFkfr ds fy, og jgs] $\frac{1}{4}$ must run $\frac{1}{2}^{\frac{1}{2}}^{\frac{1}{2}}^{\frac{1}{2}}$ Js.kh esa gks ds lkFk tks lcls ferO;;h mRiknu djrk gks dks ysuk pkfg,A fdlh cM+s mRiknu dsUnz ds feYdqy can gksus dh fLFkfr esa laosnu'khyrk dk fo'ys"k.k djus ds mn~ns'; ls] vU; mRiknu dsUnzksa ds IEHkkO; LRkj rd mRiknu c<+kdj mRiknu izs"k.k Kkr fd;k tkosxkA ,slk djrs le; mu dsUnzksa dh IEHkkO;

miyC/krk] ÅtkZ dh ykxr] rFkk ikjs"k.k ck/kkvksa vkfn dks leqfpr :i ls /;ku esa j[kuk gksxkA ftl ikjs"k.k iz.kkyh dh ;kstuk cukbZ tk jgh gS mlesa lqj {kk ekun.Mksa esa fofufnZ"V dh xbZ fofHkUu fudklh dh n'kkvksa esa ikoj ikjs"k.k gsrq usVodZ dh i;kZIr dks fopkj esa ysuk gksxkA lqj {kk ekun.Mksa esa okafNr lkekU; vkSj vkdfLed n'kkvksa ds fy, bu v/;;uksa dh iqujko`fRr dh tk,xhA

ekun.M $\frac{1}{4}$ Iykfuax ØkbVsfj;k $\frac{1}{2}$

dsUnzh; fo|qr izkf/kdj.k ds ^^esU;qvy vku V^akalfe'ku Iykfuax ØkbZVsfj;k** dks] lq/kkj ds lkFk fo'ks"kdj fLFkj fLFkfr esa oksYVst lhek vkSj lqj {kk ekin.Mksa ds lanHkZ esa bl izdkj viuk;k tkuk pkfg,] ftlls fLFkj fLFkfr esa bl lafgrk ds vuqPNsn 5-2-17 esa n'kkZ, vuqlkj lhek vksa esa oksYVst la/kkfjr fd;k tk ldsA

, - ykbZu yksfMax lhek,a %

vuqefr ;ksX; ykbZu yksfMax lhek,a a a a dsUnzh; fo|qr izkf/kdj.k ds ^^esU;qvy vku V^akalfe'ku Iykfuax ØkbZVsfj;k** ds vuq;i gksaxsA rn~uqlkj ykbZuksa dh vksojyksfMax rFkk vaMjyksfMax dks vfHkfufpr fd;k tk,xkA lh-bZ-vkj-lh- $\frac{1}{4}$ jsVl ,aM pktsZl ,aM VeZl ,aM daMh'ku QkWj ;wt+ vkWQ baVjOghfuax V^akalfe'ku QSlhfyVh $\frac{1}{2}$ fofu;e] 2010 esa fopkfjr vf/kdre ykbZu Hkkj.k {kerk] fuEukuqlkj gS%&

Øekad	oksYVst	fopkfjr ykbZu Hkkj {kerk esxk okV esa
1-	400	450
2-	220	250
3-	132	90
4-	66	27

rFkkfi] dsUnzh; fo|qr izkf/kdj.k ds ^^esU;qvy vkWu V^akalfe'ku Iykfuax ØkbZVsfj;k** dh n`f"V ls ,oa iz;qDr daMDVj ds vkdkj vkSj rkjh; lhek dks ns[krs gq, jkT; fxzM esa Mkys tkus gsrq oksYVst okj

ikoj dh vf/kdre vuqefr ;ksX; ek=k bl lafgrk ds vuqPNsn 4-2-1 esa n'kkZ;h xbZ gSA

chchchch- ikjs"k.k usVodZdZdZdZ dks lqn`<+ djus ds fy, fodYi

- (i) fo|eku iz.kkyh esa vfr Hkkfjrk Vkyus ds fy, ubZ ikjs"k.k ykbuksa dk fuekZ.k $\frac{1}{4}$ tgka dgha leku oksYVst oxZ ds rhu ;k vf/kd lfdZV nks midsUnzksa ds e/; LFkkfir fd;s x;s gks] ogka mlls Bhd mPprj ikjs"k.k oksYVst fopkj.kh; gksxkA $\frac{1}{2}$
- (ii) fo|eku ikjs"k.k ykbuksa dk mUu;u tSls pkyd ds voyEcksa dh ÅWpkbZ c<+kuk vkSj@;k ;fn LrEHk $\frac{1}{4}$ Vkoj $\frac{1}{2}$ dh cuoV ds vuqdwy gks rks mPprj oksYVst ij iznk; gsrq ^^ØkWl vkeZl~** dk bUlqys'ku c<+kukA
- (iii) fo|eku ikjs"k.k ykbuksa ds pkyd dks mPPkrj vkdkj ds pkydksa ;k ^^vkWy ,fY;wfefu;e ,YkkW; dUMDVj** }kjk izfrLFkkfir djukA
- (iv) ;s fodYi ykxr] fo'oluh;rk] ekXkkZf/kdkj vko';drkvksa] ÅtkZ gkfu] fo|qr iznk; vo:) vof/k bR;kfn ij fuHkZj djrs gSaA
- (v) tgka dgha rdudh :Ik ls lk/; gks] Hkfo"; esa ekxkZf/kdkj leL;ksa foLrkj dk;Z gsrq lHkh ,dy lfdZV ykbuksa dh ;kstuk ;qxy lfdZV

ds fcuk
LrEHkksa $\frac{1}{4}$ Vkoj $\frac{1}{2}$ ds lkFk gksus pkfg,A ekxZ vf/kdkj dh leL;k dks
lqy>kkus ds fy, cgqlfdZV VkWoj ds fuekZ.k dh ;kstuk Hkh cukbZ tk ldrh
gSA
3-3-5 lqj {kk ekud%

LVMh LVsV LVsfefyVh $\frac{1}{2}$

lqj {kk dk vFkZ gS fo|qr iz.kkyh dh vpkud vk, O;o/kku dks lgu djus dh {kerk] tSls& dksbZ fo|qr 'kkVZ&lfdZV vFkok iz.kkyh rRo dh vukisf{kr {kfr] tSlk fd dsUnzh; fo|qr izkf/kdj.kds ^^esU;qvy vku V^akalfe'ku Iykfuax ØkbZVsfi;k** dh dafMdk 6 esa n'kkZ;k x;k gSA jkT; ikjs"k.k iz.kkyh dks ,u&1 dh lqj {kk Lrj gsrq :ikafdr fd;k tk,xk vFkkZr og ,dy vkdfLedrk ls FkksMs+ udkjkRed izHkko dks lgu dj ldsA bldk vFkZ ;g gS fd cgqr xaHkhj QkWYV vFkok tujsVj]V^akalQkeZj vFkok ykbZu dh fV^afiar dh otg ls iz.kkyh dks vLFkj ugha gksuk pkfg,] ykbZuksa vkSj@vFkok V^akalQkeZjksa dh 15 feuV ls vf/kd vksoj yksfMax ugha gksuk pkfg,] vkSj

tc flLVe bEiksVZ 20% ls T;knk gks tk, rc oksYVst M^aki 10% ls vf/kd ugha gksuk pkfg,A jkT; ikjs"k.k miØe@ikjs"k.k vuqKfIr/kkj iz.kkyh ds lqj {kk Lrj dks ,u&1 Lrj $\frac{1}{4}$,dy vkdfLedrk $\frac{1}{2}$ ij cuk, j[kus ds lkFk fLFkj fLFkfr esa LFkkf;Ro ds fy, fLifuax fjtZ dk izko/kku Hkh j[ksaxsA

iz.kkyh dh ;kstuk bl izdkj dh tkuh pkfg, fd og fcuk fdlh yksM 'ksfMax ds ;k mRiknu dsUnzksa ds mRiknu esa cnyko fd;s fudklh $\frac{1}{4}$ vkmVst $\frac{1}{2}$

dh fuEufyf[kr 'krksZa esa ls de ls de fdllh ,d dks larks"ktud <ax ls lg lds %&

$\frac{1}{4}, \frac{1}{2}$ Mh@lh $\frac{1}{4}$ Mcy lfdZV $\frac{1}{2}$ ikjs"k.k ykbZu esa fdllh LraHk $\frac{1}{4}$ Vkoj $\frac{1}{2}$
dh fudklh $\frac{1}{4}$ vkmVst $\frac{1}{2}$ A

$\frac{1}{4}$ ch $\frac{1}{2}$ 132 ds-Ogh ;k 220 ds-Ogh ykbZuksa ds nks lfdZVA
 $\frac{1}{4}$ lh $\frac{1}{2}$ 400 ds-Ogh ykbZu dk ,d lfdZVA

$\frac{1}{4}$ Mh $\frac{1}{2}$,d vUrj la;ksftr $\frac{1}{4}$ bUVj dusfDVax $\frac{1}{2}$ V^akaleQkZjA

$\frac{1}{4}$ bZ- $\frac{1}{2}$,d vf/kdre {kerk dk mRiknd $\frac{1}{4}$ tujsVj $\frac{1}{2}$

$\frac{1}{4}$,Q $\frac{1}{2}$ iM+kslh fxzM ds lkFk ,d vUrj la;ksftr ykbZuA

mi;ZqDr vkdfLedrk ij fdllh vU; 220 ds-Ogh- nksgjh lfdZV ykbZu ;k 400 ds-Ogh ,dy lfdZV ykbu tks ,d vU; xfy;kjs esa gks vkSj mlh midsUnz ls u fudyh gks ls iwoZ vkdfLedrk iz.kkyh fjdR $\frac{1}{4}$;kstuc) fudklh $\frac{1}{2}$ dk vuqeku djrs gq, fopkj djuk pkfg,A lHkh mRiknu dsUnzksa dk lapkyu izfrfØ;k'khy l{kerk oØksa $\frac{1}{4}$ dsisfcfyVh dOgZ $\frac{1}{2}$ vkSj usVodZ esa fofufnZ"V oksYVst lhekviksa ds Hkhrj oksYVst izksQkby cuk;s j[krs gq, fd;k tkuk pkfg,A

$\frac{1}{4}$ [k $\frac{1}{2}$ vYidkfyd LFkkf;Ro $\frac{1}{4}$ V^akaft,UV LVsfefyVh $\frac{1}{2}$

fuEufyf[kr O;o/kkuksa ds v/khu le:irk $\frac{1}{4}$ fIUØksukbts'ku $\frac{1}{2}$ rFkk leUo; cuk;s j[kus gsrq iz.kkyh dk :ikadu fd;k tkuk pkfg,%&

$\frac{1}{4}, \frac{1}{2}$ if'pe fxzM esa ;k iM+kslh fxzMksa ls la;ksftr lcls cM+s vkdkj ds tujsVj dh fudklhA

$\frac{1}{4}$ ch $\frac{1}{2}$ 400 ds-Ogh ,dy ykbu ij Hkw nks"k] nks"kiw.kZ Qst ds ,d ikys ds [kqyus $\frac{1}{4}$ ik;p lkbZfdy $\frac{1}{2}$ lfgr vlQy fJDykstj $\frac{1}{4}$ le; ,d lsds.M $\frac{1}{2}$ RkRi'pkr nks"kiw.kZ ykbu ds rhuksa fljs [kqyus ij $\frac{1}{4}$ ik;p lkbZfdy $\frac{1}{2}$ A

$\frac{1}{4}$ lh $\frac{1}{2}$ 400 ds-Ogh Mh@lh ykbu

- (i) tc nksuksa lfdZV lapkfyr gks jgs gksa] ml le; iz.kkyh fdllh ,d lfdZV ds LFkkbZ nks"k dks lgu djus ;ksX; gks vkSj rRi'pkr~ nks"kiw.kZ lfdZV ds rhu fljs [kqyus ij $\frac{1}{4}$ 100 fefy lsds.M $\frac{1}{2}$ A
- (ii) tc mu lfdZVksa esa ls ,d la/kkj.k@fudklh ds v/khu gks rc] dk;Zjr~ lfdZV ds vLFkkbZ nks"k dks iz.kkyh lgu djus ;ksX; gksA

$\frac{1}{4}$ Mh $\frac{1}{2}$ vkB lkbZfdy dh vof/k esa 220 ds-Ogh- ;k 132 ds-Ogh- ykbu ij fdllh LFkkbZ rhu Qst nks"k ds fy, rhu fljs dk [kqyukA

$\frac{1}{4}$ bZ $\frac{1}{2}$ jsfM;y ykbuksa ds nks"k ds fy, fdllh LFkkf;Ro v/;;u dh vko';drk ugha gSA

dh dlkSVh $\frac{1}{4}$ lc&LVs'ku Iykfuax ØkbVsfj;k $\frac{1}{2}$ &

fdlh fof'k"V Hkkj dh ek=k dh iwfrZ ds fy, vko';d midsUnzksa dh la[;k oksYVst Lrjksa ds p;u] ,e-Ogh-,- {kerk vkSj vuqer QhMjksa dh la[;k bR;kfn ij fuHkZj gksrh gSA ;kstuk esa vfr mPpnkc V^akalQkeZj] vUrlZa;ksftr V^akalQkeZjksa dh la[;k ij Hkh ;kstukc)@cyiwoZd fudklh $\frac{1}{4}$ vkmVst $\frac{1}{2}$ dh vkdfLedrkvksa dks /;ku j[krs gq, fopkj fd;k tk,xkA leLr vfr mPpnkc midsUnzksa $\frac{1}{4}$ 132 ds-Ogh- rFkk mPp $\frac{1}{2}$ esa U;wure nks V^akalQkeZj gksus pkfg,A fuEufyf[kr dlkSVh viukbZ tk ldsxh%&

$\frac{1}{4}$, $\frac{1}{2}$ fdlh ,dy midsUnz dh {kerk fofHkUUk oksYVst Lrjksa ij lkekU;r% dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ fo|qrxzgksa rFkk fo|qr ykbZuksa ds fuekZ.k gsrq rduhdh ekun.M $\frac{1}{2}$ fofu;e] 2010 ds vuqlkj] fuEufyf[kr ls vf/kd ugha gksxh %&

765ds-Ogh-	4500,e-Ogh-,
400ds-Ogh-	1500 ,e-Ogh-,-
220 ds-Ogh-	500 ,e-Ogh-,-
132 ds-Ogh-	150 ,e-Ogh-,-

$\frac{1}{4}$ ch $\frac{1}{2}$ varjla;ksftr V^akalQkeZjksa $\frac{1}{4}$ vkbZ-lh-Vh- $\frac{1}{2}$ dk vkdkj vkSj fu;ksftr dh tk,xh ftlls fdlh ,dy bdkbZ ls fudklh $\frac{1}{4}$ vkmVst $\frac{1}{2}$ ds dkj.k vU; varjla;ksftr V^akalQkeZjksa dh bdkb;ksa ;k ifjpkfyr iz.kkyh ij vf/kd Hkkj $\frac{1}{4}$ vksOgj yksM $\frac{1}{2}$ u iM+s A vfr mPp nkc midsUnz esa lkekU;r% 3 ls vf/kd ikWoj V^akalQkeZj varj@varlZa;ksftr V^akalQkeZjksa dh bdkb;ka ugha gksuh pkfg,A

$\frac{1}{4}$ lh $\frac{1}{2}$ LFkkfir V^akalQkeZjksa dk vkdkj vkSj mudh la[;k bl izdkj fu;ksftr dh tk,xh ftlls fdlh ,dy bdkbZ ds fudklh $\frac{1}{4}$ vkmVst $\frac{1}{2}$ ds okilh vU; dk;Zjr V^akalQkeZjksa }kj.k leqfpr Hkkj dk iznk; gks lds A ;g dk;Z bl izdkj ls fd;k tkuk pkfg, fd lac) midsanzksa ds la;kstu ds ek;/e ls V^akalQkeZjksa dh {kerk ls vf/kd okyk Hkkj vU; lc LVs'ku esa varfjr fd;k tk ldsA

$\frac{1}{4}$ Mh $\frac{1}{2}$ fdlh midsUnz esa lfdZV czsdj dh vafdr fonkj.k {kerk $\frac{1}{4}$ cszfdax dsislVh $\frac{1}{2}$ ml

midsUnz ds vf/kdre nks"k ds Lrj $\frac{1}{4}$ QkYV ysoy $\frac{1}{2}$ ds 120% ls de u gksxh $\frac{1}{4}$ $\frac{1}{4}$ Hkfo";

esa $\frac{1}{2}$ iz.kkyh esa o`f) ij] 'kkWVZ lfdZV Lrjksa esa c<+ksRrjh dks /;ku esa j[krs gq, 20% dk varj visf{kr gS $\frac{1}{2}$ A fofHkUu oksYVst Lrjksa ij] U;wure vafdr fonkj.k {kerk vkSj fLop fx;j dh vof/k dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ fo|qr la;= rFkk fo|qr ykbuksa ds fuekZ.k gsrq rduhdh ekunaM $\frac{1}{2}$ fofu;e] 2010 ds vuqlkj fuEufyf[kr gSa %&

11 ds- Ogh-	'kgjh {ks= esa 16 ds-,-ds fy, 1 lds.M xzkeh.k {ks= esa 12-5 ds-,-ds fy, 1 lds.M
33 ds-Ogh-	25 ds-,-ds fy, 1 lds.M
132 ds-Ogh-	31-5 ds-,- ds fy, 1 vFkok 3 lds.M *
220 ds-Ogh-	40 ds-,-ds fy, 1 lds.M

400 ds-Ogh-	40 ds-, -vFkok 50 ds-, -dsfy, 1 lsds.M
765 ds-Ogh-	40 ds-, -vFkok 50 ds-, -ds fy, 1 lsds.M

*;g vof/k QkWYV ysoy ds vuqlkj fuf'pr dh tk ldsxh-

$\frac{1}{4}bZ\frac{1}{2}$ midsanz ;kstuk esa V^akalQkeZj dk balqys'ku ysey] fj;sDVj okbafMax vkSj cqf'kax dh fLFkfr] dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ fo|qr la;= rFkk fo|qr ykbuksa ds fuekZ.k gsrq rduhdh ekunaM $\frac{1}{2}$ fofu;e] 2010 ds vuqlkj fuEufyf[kr gSa %&

ntZ oksYVst	okbZafMax			cqf'kax		
	ntZ n ikWoj fÝDosa lh fonLVsa aM	n ntZ fLofpax baiYl fonLVsa aM oksYVs	ntZ ykbVax baiYl fonLVsa M oksYVst	ntZ ikWoj fÝDosa h fonLVsa aM	ntZ fLofpax baiYl fonLVsa M oksYVst	ntZ ykbVax baiYl fonLVsa M oksYVst
800 kV	-	1550	1950	880	1550	2100
420 kV	-	1050	1300	630	1050	1425
245 kV	395	-	950	460	-	1050
145 kV	275	-	650	275	-	650
72.5 kV	140	-	325	140	-	325
52 kV	95	-	250	95	-	250
36 kV	70	-	170	70	-	170
24 kV	50	-	125	50	-	125
17.5 kV	38	-	95	38	-	95
12 kV	28	-	75	28	-	75

dk vk/kkj $\frac{1}{4}$ V^akalfe'ku ykbZu Iykfuax ØkbVsfj;k $\frac{1}{2}$ %

$\frac{1}{4}, \frac{1}{2}$ ikjs"k.k iz.kkyh%

$\frac{1}{4}1\frac{1}{2}$ ikjs"k.k iz.kkyh dh ;kstuk ,dhd`r Lo:i esa dh tk,xh vkSj mls dsUnzh;

ikjs"k.k miØe] jkT; ikjs"k.k miØe] vkSj ml {ks= ds fdLh vU; ikjs"k.k

vuqKfIr/kkjh ds varxZr vkus okys dqy usVodZ dks fopkj esa ysrs gq,

vuqdwyre cuk;k tk,xk A

$\frac{1}{4}2\frac{1}{2}$ ikjs"k.k iz.kkyh dh i;kZIr dh tkap xehZ] lnhZ vkSj o"kkZ ds ekSleka esa ihd

rFkk vkWQ ihd n'kkvksa esa] ,d ;k vf/kd Hkkj mRiknu ifjn`';ksa ds fy, dh

tk,xh A

$\frac{1}{4}3\frac{1}{2}$ ikjs"k.k ykbuksa ds fy, ekxZ vf/kdkj dks Hkfo"; ds dkWjhMksj vko';drkvksa

dks ns[krs gq, eYVhlfDZV vFkok eYVhoksYVst ykbZuksa] tSlh Hkh mi;qDr ikbZ

tk,a] dks viukrs gq, vuqdwyre cuk;k tk,xk A

$\frac{1}{4}$ chchch $\frac{1}{2}$ ikjs"k.k ykbZukas dk iFk fu/kkZj.k

ikjs"k.k ykbZu ds iFk dk p;u djrs le; fuEukafdr dks /;ku esa j[kk tk,xk%

$\frac{1}{4}1\frac{1}{2}$ ikjs"k.k ykbZuksa dks lajf{kr vFkok vkjf{kr ou esa ls ys tk, tkus
ls cpk

tk,xkA ,sls izdj.k esa tgka ouksa vFkok l?ku o` {kksa ds {ks=
dks iwjh rjg ls

cpk;k tkuk laHko u gks] laiw.kZ ferO;f;rk dks /;ku esa j[krs gq,]
iFk dks

bl izdkj lajfpr fd;k tk,xk ftlls ouksa dh dVkbZ U;wure gksA blh
izdkj ikjs"k.k ykbZuksa ds iFk dks jk"V^ah; m|ku vkSj oU; tho
vHk;kj.;ksa ds

chp ls ys tkus ls Hkh cpk tkuk pkfg,A

$\frac{1}{4}2\frac{1}{2}$ flfoy vkSj lSU; ok;q {ks=ksa $\frac{1}{4}$;;jQhYM~ $1\frac{1}{2}$ tSlS izfrcf/kr {ks=
ls ykbZu ys

tkus ls cpk tk,xk vkSj bl ckr~ Hkh lko/kkuh j[kh tk,xh fd
ok;q;ku

mrkjus ds LFkkuksa $\frac{1}{4}$ ySafMax ,izkspsl $\frac{1}{2}$ ls Hkh cpk tk,A

$\frac{1}{4}3\frac{1}{2}$ ykbZu iFk esa cM+h cfLr;ksa vkSj l?ku vkcknh okys {ks=ksa ls
Hkh cpk tkuk
pkfg,A

$\frac{1}{4}4\frac{1}{2}$;g lqfuf'pr fd;k tk,xk fd ou laj{kk vf/kfu;e] oU; izk.kh laj{kk
vf/kfu;e] vkfdZ;ksykftdy losZ vf/kfu;e rFkk vU;
vf/kfu;eksa@fu;eksa@fof/k;ksa] tks Hkh iz;ksT; gksa] mudk
vuqiky fd;k tk,A

$\frac{1}{4}5\frac{1}{2}$ leLr okafNr lgefr;ksa vkSj vuqeksnuksa] ftlesa ikoj vkSj
VsyhdE;wfuds'ku

leUo; lfefr $\frac{1}{4}$ ihVhlhl $\frac{1}{2}$] ukxfjd foekuu] lM+d] unh] jsy] ugj
vFkok

ikoj ykbZu Økflax] ekxZ vuqefr vkSj i;kZoj.k rFkk ou vuqefr;ka
vkfn

lfEefyr gSa] lacaf/kr izkf/kdkfj;ksa@vfHkdj.kksa ls] izkIr djs
dh O;oLFkk

Lokeh }kjk dh tk,xhA

$\frac{1}{4}6\frac{1}{2}$ fuekZ.k dh vko';drkvksa ds vuq;i Lokeh }kjk ekxZ vf/kdkj rFkk
ekxZ

vuqefr;kas dh O;oLFkk dh tk,xhA ekxZ vf/kdkj rFkk ekxZ
vuqefr;kas ds

fy, {kfriwfrZ ;Fkk iz;ksT; fof/k] fu;eksa vkSj fofu;eksa] ekxZ
funZs'kksa rFkk

LFkkuh; iz'kklu rFkk jktLo izkf/kdkfj;ksas ds fn'kk funZs'kksa
ds vuqlkj iznku fd;k tk,xhA

lh½ ikjs" k.k ykbZuksa ds fy, izeq[k rduhdh fof'k"V;ak rFkk okaNk,a%

ikjs" k.k ykbZuksa ds fy, fo|qrh; :ikadu ijkeku ¼iSjkehVj½ fuEukuqlkj gS&

ijkeku	132 kV AC	220 kV AC	400 kV AC	765 kV AC	500 kV DC
ukWfeuy oksYVst (kV)	132	220	400	765	500
mPpre iz.kkyh oksYVst	145	245	420	800	525
Qqyos bEiYl fonLVS oksYVst (1.2/250 micro Sec.) (kV)	650	1050	1550	2400	1800
lw[kh n'kk esa ikWoj fYDosalh fonLVS.M	275	460	680	830	-
Lohfpax ltZ+ fonLVS.M	-	-	1050	1550	1000
xhyh n'kk esa (kV rms)					
fefuee dksjksuk ,DlfVaDl u	-	156	320	510	550
eSDft+eejsfM;ks baVjQjsal oksYVst ¼ekbØks oksYV½ Qst+&Vw&vFkZ	-	1000 at 156 kV	1000 at 267 kV	1000 at 510 kV	1000 22 kV/cm cor surface gradie

¼MhMhMhMh½ fofHkUu oksYVst Lrj dh ikjs" k.k ykbZuksa ds fy,
fMtkbu LikWu fuEukuqlkj gksxk%

oksYVst ¼kV½	lkekU; LikU¼ehV
765	400] 450
400	400
220	335]350]375
132	315]325]335

izfrfØ;kRed {kfriwfrZ ¼fj,fDVo daiUls'ku½%

¼,½ 'kUV dsisflVIZ% 'kUV dsisflVIZ eq[;r% Hkkj dsUnzksa ij 33 ds-Ogh-
vkSj 11 ds-Ogh- iz.kkyh ij LFkkfir fd;s tkus pkfg,A ;fn fdlh ekeys esa ,slk
fd;k tkuk lEHko u gks rks 132 ds-Ogh- iz.kkfy;ksa esa izfrfØ;kRed
{kfriwfrZ bl n'f'Vdks.k ds lkFk nsus dk izko/kku fd;k tkuk pkfg, fd Hkkj
fcUnqvksa ds fudV Hkkj ds izfrfØ;k'khy ikoj dh vko';drk dh iwfrZ dh
tk ldsA 05 ,e-Ogh-, rFkk vf/kd dh {kerk ds lcLVs'ku ds fy, dsisflVj
Lopkfy ¼vkVksesVsM fLopscy½ izdkj dk gksuk pkfg,A ,sls lcLVs'ku
tgkW cgqr 'kh?kz ifjofrZr Hkkj ¼gkbyh ¶yDpq,fVax yksM½ tSls vkdZ

QusZ'k vkfn gksa] esa ¶ydyj rFkk oksYVst jsxqys'ku dh leL;k LVsfVd
okj daiu lsVj¼,l-Ogh-lh-,l-½ yxk dj nwj dh tk ldrh gSA

¼chch 'kUV fj,sDVIZ% fofufnZ"V lhekVksa Hkhrj oksYVst fu;a=k ds fy,
chch½ 400 ds-Ogh- midsUnzksa esa fLopscy 'kUV fj,DVj miyC/k dj;k;s
5% ls vf/kd dk varj ugha gksuk pkfg,A mi;qDr ykbZu fj,DVj
¼fLopscy@fQDLM½ miyC/k dj;k;k tkuk pkfg,] rkfd 400 ds-Ogh-
ykbZuksa dh pkftZax fofufnZ"V oksYVst lhekVksa dk vfrya?ku u dj
ldasA

fj,DVlZ ds ekud vkdkj $\frac{1}{4}$,e-Ogh-,-vkj- $\frac{1}{2}$ fuEukuqlkj gS&

$\frac{1}{4}$ i $\frac{1}{2}$ 400 kV $\frac{1}{4}$ rhu Qst+ ;wfuV $\frac{1}{2}$ 420 kV ij 50] 63 ,oa 80

$\frac{1}{4}$ ii $\frac{1}{2}$ 765kV $\frac{1}{4}$,d Qst+ ;wfuV $\frac{1}{2}$ 800 kV ij 50] 63 ,oa 110

gkbZ oksYVst Lrj dh yach ykbZuksa ij fLofpax vksoj oksYVst esa dVkSrh
djus rFkk QkWYV djsaVksa dks lhfer djus ds fy, ykbZu fj,DVjksa dks
izfrLFkkfir fd;k tk,xkA

3-4 leLr jkT;karfjd miHkksDrk] jkT; ikjs"k.k miØe dks ikjs"k.k vuqKfIr/kkjH ds
v/khu vius nkf;Roksa ds fuokZg gsrq l{ke cukus ds fy, iz.kkyh dk v/;;u djus vkSj
ifjn`f`V ;kstuk,a cukus gsrq jkT; ikjs"k.k miØe dks le;≤ ij MkVk iath;u
v/;k;&12 rFkk ;kstuk MkVk ds :i esa oxhZd`r] ifjf`k`V&, esa n`kkZ;s izi= esa
vko';d MkVk miyC/k dj,axsA iz.kkyh $\frac{1}{4}$ fxzM $\frac{1}{2}$ ds lkekarj pyus okyh vkbZ-,u-th-
,l- ls lacaf/kr MkVk fdLh izdkj dh mRiknu bdkbZ ds o`f) ij rFkk
forj.k@ikjs"k.k iz.kkyh ds :ikarj.k vkfn ij] v|ru fd;k tk,xkA

3-5 jkT;karfjd mi;ksxdrkZvksa dks mUgsa iz;ksT; ds fy, ikjs"k.k iz.kkyh ds lkFk
vius la;a=ksa dh ;kstuk] :ikadu rFkk lapkyu ds leUo; dh n`f`V ls dfri; egRoiw.kZ
MkVk izkIr dj ldasxsA jkT; ikjs"k.k miØe@ikjs"k.k vuqKfIr/kkjH ifjf`k`V&ch
ds vuqlkj foLr`r ikjs"k.k iz.kkyh MkVk ds :i eas oxhZd`r] bu leadks dks iznk;
djsaxsA

3-6 mi;ZqDr izko/kkuksa ds vfrrfjDr] Hkkjrh; fo|qr fxzM lafgrk dh ;kstuk lafgrk]
tks leadksa ds fofue; dk vkOgku djrh gS] Hkh mRiknu daifu;ksa] ikjs"k.k
vuqKfIr/kkfj;ksa] miØeksa vkSj forj.k vuqKfIr/kkfj;ksa dks
mRiknu@varjkZT;h; ikjs"k.k iz.kkf;ksa }kjk ÅtkZ ds ikjs"k.k ds laca/k esa
ykxw gksxhA

3-7 ifjf`k`V&, ds vuqlkj ,d ckj ns; lead lHkh lacf/krksa }kjk fxzM lafgrk ds
izHkko`khy gksus ds fnukad ls rhu ekg ds Hkhrj jkT; ikjs"k.k
miØe $\frac{1}{4}$,l-Vh-;w $\frac{1}{2}$ ds le{k izLrqr fd;s tkosxsA ;g Hkh fd] loZlacaf/krksa }kjk ,d ckj
miyC/k dj, x, leadksa esa] ;fn dksbZ ifjorZu gks rks bldh tkudkjH nsuh gksxhA
,sls leadksa ds izfrosnu ds laca/k esa lh-,l-bZ- vkj-lh- $\frac{1}{4}$ la;kstdrk rFkk
jkT;karfjd vkSiu ,Dls $\frac{1}{2}$ fofu;eu] 2011 le;≤ ij ;Fkkla'kksf/kr :i ls ikyuh;
gksaxsA

&&000&&

v/;k; & 4

la;kstdrk dh 'krsZ ,oa

ekun.M

4-1 ifjp; vkSj mn~ns';%

(i) ,sls mi;ksxdrkZ] tks jkT;karfjd ikjs"k.k iz.kkyh ls la;ksftr gS@la;ksftr
gksuk pkgrs gSa os dsanzh; fo|qr izkf/kdj.k $\frac{1}{4}$ fxzM ls la;kstdrk gsrq
rdudh ekun.M $\frac{1}{2}$ fofu;e] 2007 rFkk NRrhlx<+ jkT; fo|qr fu;ked vk;ksx

$\frac{1}{4}$ la;kstdrk ,oa jkT;karfjd vksiu ,Dlsl $\frac{1}{2}$ fofu,e] 2011 ;Fkk iz;ksT;] dk vuqiky djsaxsA

(ii) tgka dgha jkT; fxzM varjkZT;h; ikjs"k.k iz.kkyh ls la;ksfr gS ogkW vkbZ-bZ-th-lh- dh la;kstdrk 'krksZa ls lacaf/kr izko/kku izHkkoh gksaxsA

(iii) bl v;/k; esa fofufnZ"V la;kstdrk 'krksZa dk mn~ns'; fuEukuqlkj gS%&
 $\frac{1}{4}$ d $\frac{1}{2}$ jkT; fxzM dk lqjf{kr lapkyu] ,dhdj.k rFkk fo'oluh;rk dks lqfuf'pr djukA

$\frac{1}{4}$ [k $\frac{1}{2}$ leLr jkT;karfjd mi;ksxdrkZvksa dks fcuk fdLH Hksn&Hkko ds O;og`r djus dh n`f"V ls la;kstdrk dh 'krksZa ds vk/kkjHkwr fu;eksa dk vuqiky gksA

$\frac{1}{4}$ x $\frac{1}{2}$ dksbZ uohu vFkok :ikarfjr la;kstu tc yxk;k tk,a] rks og iz.kkyh ij vkSj@vFkok iz.kkyh ds jkT;karfjd mi;ksxdrkZ ij vLohdj.kh; izHkko u Mkyrk gksA

$\frac{1}{4}$?k $\frac{1}{2}$ dksbZ O;fDr] tks fxzM ls la;kstu izklr djus dk bPNqd gS mls igys gh ls jkT;karfjd ikjs"k.k iz.kkyh ls la;kstdrk dh izfØ;k vkSj jkT; fxzM ls

,dhd`r gksus gsrq] iwjh dh tkus okyh 'krksZa ,oa izfr Hkh tkudkj gksuh pkfg,A

4-2 la;kstu fcUnq@baVjQsl fcUnq%

mRiknu dsUnz% og oksYVst ftl ij dksbZ mRiknu dsUnz] ikjs"k.k dh fxzM vFkok forj.k vuqKflr/kkjH $\frac{1}{4}$;Fkk iz;ksT; $\frac{1}{2}$ ls la;ksfr fd;k tk ldrk gS] og 400] 220] 132 vFkok 33 kv gks ldrk gSA la;kstu fcUnq@baVjQsl fcUnq] vuqKflr/kkjH ds midsUnz dk fcUnq tgkW fo|qr var%{ksfir $\frac{1}{4}$ bUtsDV $\frac{1}{2}$ dh tk jgh gS] gksxkA ehVfjax fcUnq] ml la;kstu fcUnq@baVjQsl fcUnq ij gksxkA oksYVst batsD'ku ds lanHkZ esa jkT; fxzM esa Mkyh tkus okyh fu/kkZfjr fo|qr dh ek=k fuEukuqlkj jgsxh %&

Øeka	var%{ksi.k dk	fxzM esa Mkyh tk ldus okyh vf/kdre ikoi dh ek=k
1-	33 KV	15 MVA rd
2-	132 KV	75MVARdds fy, flaxky lfdZV vkSj 150 MVARd ds fy, Mcy lfdZV
3-	220 KV	200 MVARdds fy, flaxky lfdZV vkSj 400 MVARd ds fy, Mcy lfdZV

fVli.khkhkhkh %&

$\frac{1}{4}$ 1 $\frac{1}{2}$,e-Ogh,- esa var%{ksfir dh tkus okyh ikoj Kkr djus ds fy,] tujsVj ds uke ifV~Vdk ij nf'kZr ikWoj QsDVj vFkok :ikadu fooj.k] fopkj esa fy;k tk,xkA

$\frac{1}{4}$ 2 $\frac{1}{2}$ fo'ks"k ifjLFkfr;ksa esa mi;qZDr lhek vksa ls fdLH fopyu dks vuqKflr/kkjH }kj] rduhdh O;ogk;Zrk rFkk vk;ksx ds fof'k"V vuqeksnu ds varxZr jgrs gq,] fopkj esa fy;k tk ldrk gSA ,slk bl lafgrk ds vuqPNsn 8-

6 esa fofufnZ"V ehVj dh U;wure rduhdh vko';drk dh iwfrZ ds varxZr
jgsxkA

$\frac{1}{4}3\frac{1}{2}$ lefiZr $\frac{1}{4}$ MsMhdsVsM $\frac{1}{2}$ ikjs"k.k ykbZu esa vkf/kD; $\frac{1}{4}$ fjMUMsUlh $\frac{1}{2}$
gsrq izko/kku djuk lacaf/kr tujsVj dk mRrjnkf;Ro gksxkA

4-2-2 dsfIVo tujsfVax IykaV lfgr ,sls leLr mRiknu dsUnz] ftuesa 15 ,e-Ogh,- ls
vf/kd dk var%{ksi.k vkSj@vFkok vkgj.k dh vko';drk gS] dks fxzM ls
fuEufyf[kr esa ls fdlh ek;/e ls] muds vius O;; ij] rduhdh O;ogk;Zrk ds varxZr
la;kstdrk izkIr gksxh(

$\frac{1}{4}1\frac{1}{2}$ fudVre vfr mPpnkc midUnz ls lefiZr vfr mPpnkc ikjs"k.k ykbZu ds
}kjkA

$\frac{1}{4}2\frac{1}{2}$ iwy fd, x,@fLofpax@yksM dSVfjax@LVsi&vi midUnz ls lefiZr vfr
mPpnkc ikjs"k.k ykbZu ds }kjkA

$\frac{1}{4}3\frac{1}{2}$ vfr mPpnkc ykbZu ij fdlh Vsi dusfDVfoVh dh vuqefr ugha jgsxhA

4-2-3 dsfIVo tujsfVax IykaV lfgr ,sls leLr mRiknu dsUnz] ftuesa 15 ,e-Ogh,- rd dk
var%{ksi.k vkSj@vFkok fudklh dh vko';drk gS] dks fxzM ls fuEufyf[kr esa
ls fdlh ek;/e ls muds vius O;; ij] terd fd vk;ksx }kjk vU;Fkk :i ls fofufnZ"V u
fd;k tk,] la;kstdrk izkIr gksxh(

$\frac{1}{4}1\frac{1}{2}$ fudVre vfr mPpnkc midUnz ls 33 ds-Ogh- dh lefiZr ykbZu ds }kjkA

$\frac{1}{4}2\frac{1}{2}$ fudVre 33@11 ds-Ogh- midUnz ls 33 ds-Ogh- dh lefiZr ykbZu ds
}kjkA

$\frac{1}{4}3\frac{1}{2}$ 33 ds-Ogh- fLofpax ;k iwfyax miØsUnz ls 33 ds-Ogh- dh lefiZr ykbZu
ds }kjkA

$\frac{1}{4}4\frac{1}{2}$ 33 ds-Ogh- ykbZu ij fdlh Vsi dusfDVfoVh dh vuqefr ugha jgsxhA

4-2-4 dsfIVo tujsfVax IykaV lfgr ,sls leLr fo|eku mRiknu dsUnz] ftuesa tks
vuqPNsn 4-2-2 vkSj 4-2-3 esa fofgr fd, ds vykok vU; fdlh ek;/e ls iz.kkyh ls
tqMs+ gksa os vuqPNsn 4-2-2 vkSj 4-2-3 esa fofgr fd, vuqlkj fodYiksa ds
vuqlkj fxzM ls la;kstdrk lqfuf'pr djsaxs] ftlesa vlQy jgus ij mudh fxzM ls
la;kstdrk] foPNsnuh; jgsxhA rFkkfi] vk;ksx ,sls la;kstu dks jkT;karfjd
mi;ksxdrkZ ds fuosnu ij ck;/dkjh dkj.kksa ls fof'k"V izdj.k ds :i esa dqN
vof/k ds fy, la;kstdrk dh vuqefr iznku dj ldsxkA

iwfyax midUnz ls la;kstdrk dh vuqefr dsoy rHkh iznku dh tk,xh tc og
rduhdh :i ls O;ogk;Z gksA mHk; $\frac{1}{4}$ dkWeu $\frac{1}{2}$ v/kkslajpuk tSlS] ikjs"k.k ykbZu
fLop xs;j@LVsi&vi V^akalQkeZj vFkok vU; dksbZ midj.k@v/kkslajpuk
ftlesa fj;y VkbZe MkVk V^akalQj@lapkj vkfn dh lqfo/kk,a tSlk izdj.k gks
lfEefyr gS] dh ykxr ?kVd tujsVjksa@dsfIVo tujsfVax dsUnzksa }kjk muds
}kjk fxzM esa nh tk jgh vuqikfrd ikoj ds eku ls] ogu dh tk,xhA dksbZ fo|eku
mRiknu dsUnz] tks orZeku esa vuqPNsn 4-2-2 vkSj 4-2-3 ds varxZr lekfr
ugha gksrk] og lh-,l-ih-Mh-lh-,y- dh yksM 'ksfMax ;kstuk ds rgr] $\frac{1}{4}$ tSlh vkSj

tgka ykxw dh tk,^{1/2}] vuqPNsn 4-2-2 vkSj 4-2-3 ds varxZr mudh la;kstdrk rd v/khu gksxkA

forj.k vuqKflr/kkjh% la;kstu fcUnq@bUVjQsl fcUnq] ikjs"k.k vuqKflr/kkjh ds midsUnz ds fudklh QhMj dk xSaVjh ^{1/4}vkmV xksbZax QhMj xSaVjh^{1/2} gksxkA ikjs"k.k vuqKflr/kkjh ds midsUnz ij vfr mPpnkc ^{1/4}bZ-,p-Ogh-^{1/2} fo|qr V^akalQkeZj ds 33 ;k 11 ds-Ogh- dk Nksj] ekiu fcUnq ^{1/4}Metering point^{1/2} gks ldsxkA vfr mPpnkc miHkksDrk ds izdj.k esa la;kstu fcUnq@bUVjQsl fcUnq vfr mPpnkc miHkksDrk midsUnz ds vkod laHkj^d ^{1/4}budfeax QhMj^{1/2} xSaVjh ij ehVj fcUnq gksxkA vfr mPpnkc miHkksDrkvksa ds izdj.k esa la;kstu fcUnq@bUVjQsl fcUnq ij ehVfax midj.kksa ds la/kkj.k dk nkf;Ro forj.k vuqKflr/kkjh dk gksxk A vf/kd forj.k vuqKflr/kkfj;ksa ds gksus ij ehVfax muls lacaf/kr bUVjQsl fcUnq ij dh tk,xhA ikjs"k.k vuqKflr/kkjh ds ifjlj esa fLFkr lapkj] lqj{kk vkSj ekiu ds lHkh VfeZuy midj.kksa ^{1/4}terminal equipment for communication, protection and metering^{1/2} dk LokfeRo ikjs"k.k vuqKflr/kkjh dk gksxk vkSj og mudk j[kj[kko Hkh djsxkA

vU; ikjs"k.k iz.kkfy;ksa ls la;kstu% vU; jkT;ksa dh ikjs"k.k iz.kkfyh ds fy, la;kstu ekiu vkSj laj{kk ;kstuk] ekiu fcUnq vkSj oksYVst dsUnzh; ikjs"k.k miØe rFkk jkT; ikjs"k.k miØe@ikjs"k.k vuqKflr/kkjh ds e/; fu"ikfnr vuqca/k ds vuqlkj gksxkA jkT; ds Hkhrj fdllh vU; ikjs"k.k vuqKflr/kkjh dh ikjs"k.k iz.kkfy;ksa ls la;kstu] lacaf/kr vuqKflr/kfj;ksa ds e/; fu"ikfnr vuqca/k ds vuqlkj gksxkA

4-3 ikjs"k.k iz.kkfyh ls la;kstu gsrq vkosnu dh izfØ;k%

@vuqKflr/kkjh@vksiu ,Dlsl miHkksDrk tks uohu la;kstu yxkuk pkggrk gS vFkok ikjs"k.k iz.kkfyh ds mi;ksx gsrq la;kstu esas ifjorZu djuk pkggrk gS] viuk vkosnu lh-,l-bZ-vkj-lh- }kj le;≤ ij ;Fkkla'kksf/kr] NRrhlx<+ jkT; fo|qr fu;ked vk;ksx ^{1/4}la;kstdrk rFkk jkT;karfjd vksiu ,Dlsl^{1/2} fofu;e] 2011 ds fofu;e 10 esa ifjHkkf"kr izfØ;k vuqlkj fofgr 'kqYd ds lkFk ns ldsxkA

4-4 fxzM la;kstdrk ds fy, lkekU; fl)kar vkSj 'krsZa% % % % fxzM ls la;kstdrk lkekU;r% fuEufyf[kr 'krksZa ds v/khu miyC/k djkbZ tk,xh%& ^{1/4}1 ^{1/2} lHkh jkT;karfjd mi;ksxdrkZvksa vFkok laHkkO; mi;ksxdrkZvksa ls O;ogkj fd;k tk,xkA

^{1/4}2 ^{1/2} vuqKflr laca/kh nkf;Roksa dk vuqiky ds lanHkZ esa jkT;karfjd mi;ksxdrkZvksa dh lgk;rk djus gsrq :ikadu ^{1/4}design^{1/2} rFkk lapkyu ekunaM ds fy;s visf{kr U;wure ekudksa dks fofufnZ"V djrs gq, Lohdk;Z xq.kksa okyh iz.kkfyh lqfuf'pr dh tk;sA

^{1/4}3 ^{1/2} izR;sd LFky ds fy;s] tgka dgha Hkh la;kstu fn;k x;k gS leLr midj.kksa ds LokfeRo o mRrjnkf;Ro dks ^LFky] nkf;Ro] vuqlwph** ^{1/4}site, responsibility, schedule^{1/2} esa lkQ&lkQ fy[kk tkuk pkfg;sA

^{1/4}4 ^{1/2} ikjs"k.k ,oa mRiknd QhMj ^{1/4}generator feeder^{1/2} ykbZuksa ds lkFk 132 dsOgh ls 400

dsOgh , -lh- midsUnz dk izR;sd varlZa;kstu $\frac{1}{4}$ tkS cl la:Ik (bays configuration) ij vk/kkfjr gks $\frac{1}{2}$,d vFkok vf/kd czsdj $\frac{1}{4}$ breaker $\frac{1}{2}$ okys cst $\frac{1}{4}$ bays $\frac{1}{2}$ esa lekIr $\frac{1}{4}$ terminate $\frac{1}{2}$ gksxkA

$\frac{1}{4}$ 5 $\frac{1}{2}$ mRikndksa ,oa dsfIVo mRikndksa ds lekUkkUrj.k $\frac{1}{4}$ paralleling $\frac{1}{2}$ rHkh djus fn;k tkosxk tc ;g lqfufpr gksxk fd dsfIVo tujsVj us bUVj dusfDVax QhMj $\frac{1}{4}$ inter

connecting feeder $\frac{1}{2}$ ij leqfpr lqj {kk ;kstuk $\frac{1}{4}$ proper protection $\frac{1}{2}$ viuk;h gS ,oa lgh lapkyu mik; $\frac{1}{4}$ proper operational measures $\frac{1}{2}$ viuk;s gS $\frac{1}{4}$ tujsVj Nksj ij czsdj lsD'ku ykbtj vkfn $\frac{1}{2}$ A tujsVj fljs ds varlZa;kstu QhMjksa $\frac{1}{4}$ interconnectivity feeder $\frac{1}{2}$ ij tks lqj {kk ;a= $\frac{1}{4}$ protection device $\frac{1}{2}$ vkSj midj.k yxkus gS mudh lwph tujsVj }kjk jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ @ikjs"k.k vuqKfIr/kkjH dks nh tkosxhA blh izdkj ikjs"k.k vuqKfIr/kkjH }kjk baVj dusfDVax QhMj esa yxk, tkus okys lqj {kk ;a= o midj.k dh tkudkjH ikjs"k.k vuqKfIr/kkjH }kjk tujsVj dks nh tk,xhA

$\frac{1}{4}$ 6 $\frac{1}{2}$ lacaf/kr jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ dks izR;sd dsfIVo ikoj mRiknd ds lekukarj.k $\frac{1}{4}$ parelleling $\frac{1}{2}$ la;kstu gsrq lekukarj lapkyu izHkkj] $\frac{1}{4}$ parallel operation charges $\frac{1}{2}$ tks vk;ksx }kjk le; le; ij r; fd;k tk,xk] nsaxsA

$\frac{1}{4}$ 7 $\frac{1}{2}$ fxzM izpkyu ds nkSjku vius iz.kkyh esa mRiUu xfrjks/k ds dkj.k mi;ksxdrkZ fxzM vius la/kkj.k lkj.kh $\frac{1}{4}$ maintenance schedule $\frac{1}{2}$ esa ifjorZu gsrq vkxzg ugha djsaxsA

$\frac{1}{4}$ 8 $\frac{1}{2}$ iz.kkyh esa ?kksj ladV dh ifjLFkfr;ksa esa lhthih lfgr leLr tujsVj] vius&vius ;wfuV dks iz.kkyh ls vyx&Fkyx $\frac{1}{4}$ vkblksys'ku o vkbZysafMax $\frac{1}{2}$ djus dh leqfpr O;oLFkk djasxsA

$\frac{1}{4}$ 9 $\frac{1}{2}$ iz.kkyh dh vko';drk ds vuqlkj mRiknu@dsfIVo mRiknu la;a= fuekZrk }kjk mYysf[kr fMtkbZu lhekVksa ds v/khu] lfØ; ikoj vkiwfrZ ds vuqikr $\frac{1}{4}$ matching with active power supply $\frac{1}{2}$ esa leqfpr izfrfØ;k'khy ikoj $\frac{1}{4}$ reactive power $\frac{1}{2}$ miyC/k dj;sxkA

$\frac{1}{4}$ 10 $\frac{1}{2}$ de fYDosalh dh n'kk esa tujsVj@dsfIVo ikWoj tujsVj vius vf/kdre mRiknu $\frac{1}{4}$ generation maximization $\frac{1}{2}$ ds fy;s] tujsVj esa miyC/k lexz fLifuax fjtOZ {kerk dks izpkyu esa mi;ksx djsxkA

$\frac{1}{4}$ 11 $\frac{1}{2}$ vfr'k; vkikr fLFkfr esa ;fn dsfIVo tujsVj ikWoj bUtsDV u dj jgk rks mi;ksxdrkZ $\frac{1}{4}$ dsfIVo o uku dsfIVo miHkksDrk $\frac{1}{2}$ dks Hkh yksM 'ksfMax djuk t:jh gksxkA

$\frac{1}{4}$ 12 $\frac{1}{2}$ ekax@vkgj.k@f}i{kh; fofue; vkfn ds 'ksM~;qfyax rFkk izs"k.k gsrq $\frac{1}{4}$ for scheduling and despatching of demand/drawal/bilateral exchanges etc. $\frac{1}{2}$ dsfIVo tujsfVax IykaV lh-th-ih- dks vU; mRikndksa $\frac{1}{4}$ tujsVj $\frac{1}{2}$ ds led{k ekuk tkosxk A

$\frac{1}{4}$ 13 $\frac{1}{2}$ la;kstdrk :ikarj.kksa $\frac{1}{4}$ connectivity modifications $\frac{1}{2}$ ds dkj.k mRiUu ifjLFkfr esa fxzM la;kstu fcUnq ij rFkk viuh iz.kkyh esa fLFkr

midj.kksa ds jsfVax esa lq/kkj gsrq jkT;karfjd mi;ksxdrkZ dk;Zokgh
djsxkA

$\frac{1}{4}14\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ la;kstu fcUnq ij] lezx fxzM ekun.M ds
vuqlkj lqj {kk ekudksa $\frac{1}{4}$ protection standards $\frac{1}{2}$ vkSj fjys leUo;u $\frac{1}{4}$ relay
coordination $\frac{1}{2}$ dk vuqiky lqfu'pr djsxkA

$\frac{1}{4}15\frac{1}{2}$ fxzM ifjpkYu lqxe cukus ds fy,] jkT;karfjd mi;ksxdrkZ
varjla;kstu fcUnq ls VsyhehVfjax] SCADA rFkk vU; izklafxd vkadM+s
 $\frac{1}{4}$ data $\frac{1}{2}$ lacaf/kr ,l-,y-Mh-lh- dks miyC/k dj,xk A

$\frac{1}{4}16\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ fxzM esa [kjkch $\frac{1}{4}$ disturbance $\frac{1}{2}$ vkus dh
fLFkfr esa viuh iz.kkyh ij /;ku nsxk] u fd fxzM lqj {kk ;kaf=dh $\frac{1}{4}$ grid defence
mechanism $\frac{1}{2}$ ij gh fuHkZj jgsxk A

$\frac{1}{4}17\frac{1}{2}$ viuh iz.kkyh esa mRiUu O;o/kku ds dkj.k] fxzM varlaZ;kstu ls
vius czsdj dh rhozrk ls [kqyus o vyx gksus $\frac{1}{4}$ QkLV vksifuax o
vkbLkSys'ku $\frac{1}{2}$ ds fy;s mi;ksxdrkZ]

laosnu'khy o fo'oluh; lqj {kk (sensitive and reliable protection) vfuok;Zr%
lqfu'pr djsxkA

$\frac{1}{4}18\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ ,l-,y-Mh-lh- }kjk ;Fkk r;] mRiknu@yksM
tgka Hkh miyC/k gks] ds ;ksxnku }kjk vkbZySfMax rFkk vU; fxzM Ldhe
esa Hkkx ysxkA vkbZySfMax vkjS'ku ds nkSjku vkosnd ,l-,y-Mh-lh- ds
vuqns'kksa ds vuqlkj Hkkj iquLFkkZiu ekxZn'kZu $\frac{1}{4}$ load restoration
guideline $\frac{1}{2}$ dk vuqiky djsxk A

$\frac{1}{4}19\frac{1}{2}$,sls izdj.k esa] tgka mlds {ks= esa vius tujsfVax lalk/ku gaS]
jkT;karfjd mi;ksxdrkZ ,l-,y-Mh-lh- vuqns'kksa ds vuqlkj LVkVZ vi ikWoj
vkiwfrZ ds ek;/e ls fxzM dh lgk;rk djsxkA

$\frac{1}{4}20\frac{1}{2}$ lqj {kr o fo'oluh; fxzM izpkYu lqfu'pr djus ds mn~ns'; ls
fo'ys"k.k gsrq jkT;karfjd mi;ksxdrkZ fxzM fo'u mRiUu gksus ij ,l-,y-
Mh-lh- dks lacaf/kr lqj {kk fV^afiax dk vkadM+k $\frac{1}{4}$ protection tripping data $\frac{1}{2}$
miyC/k dj,xkA

$\frac{1}{4}21\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ dks mldh iz.kkyh esa [kjkch gks tkus dh
n'kk esa] ,l-,y-Mh-lh- }kjk fxzM ls LVkVZ vi ikWoj rFkk cgkyh ds fy;s
lgk;rk nh tk,xhA

$\frac{1}{4}22\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ okys nwljh ;wfVyhVh ds O;fDr;ksa }kjk
la;qDr Hkkx $\frac{1}{4}$ dkWeu iks'kZu $\frac{1}{2}$ ftuesa ykbZu ijfeV lfEefyr gSa] ds
la/kkj.k gsrq lqj {kk ekud o ifjpkYu izfØ;k dk vuqiky lqfu'pr djsxk ,oa
lkFk lkFk vkbLkSysVj [kqyh fLFkfr esa ykWfdax gsrq vuqer djsxk rkfd
,DlhMsUVy pkftZax ls cpko gks ldsA

$\frac{1}{4}23\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ] leqfpr Vs fyEkhVjhax dh igqap
 $\frac{1}{4}$ accessibility $\frac{1}{2}$,Dlizsl lapkj ds ek;/e ls lqfu'pr djsxk rkfd leLr lacaf/krksa
dks fxzM varjla;kstu MkVk miyC/k gksA

$\frac{1}{4}24\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ dks bl lafgrk ds v;/k;&8 ds izko/kku
vuqlkj leqfpr bothZ ehVj dk izfr"Bkiu lqfufpr djuk gksxkA

$\frac{1}{4}25\frac{1}{2}$ bPNqd i{kdkjksa rFkk lacaf/kr ;wfVfyVh dh mifLFkfr esa
varlZa;kstu fcUnq ij midj.k ,oa ikoj ehVj dk ijh{k.k
 $\frac{1}{4}$ VsfLVax $\frac{1}{2}$ @ifjx.kuk $\frac{1}{4}$ dsfyczs'ku $\frac{1}{2}$ vuqKflr/kkj dh dkj,xk rFkk
bPNqd i{kdkj rFkk ,l-,y-Mh-lh- lfgr] lacaf/kr ;wfVfyVh@laxBu dks
,sls lkof/kd tkap ds izfrosnu miyC/k dkj,xkA

$\frac{1}{4}26\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ] jkT; Hkkj izs"k.k dsUnz $\frac{1}{4}$,l-,y-Mh-lh-
 $\frac{1}{2}$ @jkT; ikjs"k.k miØe $\frac{1}{4}$,Lk-Vh-;w- $\frac{1}{2}$ ls ijke'kZ dj vius ykbZUI@varj
dusfDVax V^akalQkeZj $\frac{1}{4}$ ICT $\frac{1}{2}$;k dusfDVax ikbZaV ds la/kkj.k
'ksM~;wy $\frac{1}{4}$ maintenance schedule $\frac{1}{2}$ dk dk;ZØe cuk,xkA

$\frac{1}{4}27\frac{1}{2}$,l-,y-Mh-lh- dks] flLVe vkij's'ku dh viokn Lo:Ik $\frac{1}{4}$ in exceptional
cases $\frac{1}{2}$ izfrdwy ifjLFkfr;ksa esa] jkT;karfjd mi;ksxdrkZ dh iz.kkyh
gsrq la/kkj.k 'ksM~;wy $\frac{1}{4}$ maintenance schedule $\frac{1}{2}$ dks LFkfxr djus dk vf/kdkj
gksxkA ;g dsOy viokn Lo:i gh gksxk u fd fu;e ds :i esaA

$\frac{1}{4}28\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ] midj.k rFkk OkS;fDrd lqj{kk} midj.k
laj{kk $\frac{1}{4}$ equipment protection $\frac{1}{2}$ o fxzM vkij's'ku dksM] i;kZoj.k lqj{kk ekun.M
rFkk ,slh vU; jk"V^ah; uhfr;ka] tks bl izys[k esa lwphc) ugha gSa] ds
lacaf/kr lHkh izpfyr ekun.Mksa dks lqfufpr djsxkA

$\frac{1}{4}29\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ tc Hkh vius iz.kkyh esa jkT; ikjs"k.k
miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ rFkk dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ lh-bZ-,- $\frac{1}{2}$ }kjk
fu/kkZfjr ekun.M@ekud ls csgrj midj.k lqj{kk} xzkmf.Max o vU;
vkij's'ku@izksVsD'ku ekud rFkk ekuoh; lqj{kk dk vaxhdj.k ;k vuqiky djk
gS rks og bldh tkudkj ckaVsxk rkfd csgrj ekud ls fxzM rFkk jk"V^a]
ykHkkfUor gks ldsA

$\frac{1}{4}30\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ fdllh e`r miØe la;kstu dks rc rd ÅthZd`r
ugha djsxk tc rd ,l-,y-Mh-lh- }kjk vuqefr iznku u dj nh tk,A

4-5 VsyhehVjh vko';drk,a%

4-5-1 jkT; ikjs"k.k miØe lfgr leLr jkT;karfjd mi;ksxdrkZ vkSj ikjs"k.k
vuqKflr/kkj dh vius&vius Nksj ij la;kstu vuqca/k esa fofufnZ"V fd, vuqlkj
vko';d lqfo/kk,a miyC/k dkj,axs %

ijUrq lapkj rFkk MkVk varj.k gsrg midj.k@;a= jkT; ikjs"k.k miØe vkSj jkT;
Hkkj izs"k.k dsUnz ds fn'kk&funZs'kksa] baVjQsl vko';drkvksa vkSj ;Fkk
iz;ksT; ekxZ funsZ'kksa@fof'k"Vvksa ds vuqlkj miyC/k dkj;k tk,xkA

4-5-2 lkekU; vkSj vlkekU; n'kkvksa esa ,l-,y-Mh-lh- dks vko';d lapkj nsus vkSj
MkVk ,Dltsap djus rFkk jkT; Hkkj izs"k.k dsUnz }kjk jkT; fxzM ds
fujh{k.k@fu;a=.k ds fy,] fo'oluh; rFkk l{ke Lihp vkSj MkVk dE;qfuds'ku
iz.kkyh miyC/k dkj, tk,axsA

- 4-5-3 jkT; fxzM ds {ks=h; fxzM ls leUo; esa izHkkoh lapkyu ds fy,] forj.k vuqKfIr/kkjh lfgr jkT; ikjs"k.k miØe] vkSj ikjs"k.k vuqKfIr/kkfj;ksa vkSj jkT;karfjd mi;ksxdrkZvksa ij ,l-,y-Mh-lh- }kjk fofufnZ"V ds vuqlkj uohure rduhd $\frac{1}{4}$ MkVk ,D;qts'ku ,oa dE;wfuds'ku $\frac{1}{2}$ dk mi;ksx djrs gq, fj;y VkbZe@ vkWu ykbZu vk/kkj ij vko';d fLLVe vkWijs'ku iSjkehVjksa dks miyC/k djkus] dk mRrjnkf;Ro gksxkA
- 4-5-4 ,l-,y-Mh-lh- }kjk vkj-,y-Mh-lh- ls ,d fo'oluh; dE;wfuds'ku pSuy lqfuf'pr fd;k tk,xkA ,l-,y-Mh-lh- nwjHkk"k funZs'kksa vkSj tkudkj dks fjdkMZ djus ds fy, okbl&ykWfxax fLLVe dks izfr"Bkfir vkSj la/kkfjr djsxhA
- 4-5-5 01 esxk okV vkSj mlls vf/kd ds jkT;karfjd ikjs"k.k iz.kkyyh vFkok forj.k vuqKfIr/kkjh ds usVodZ ls la;kstu pkgus okys vkSj vksiu ,Dlsl dk ykHk ysus okys jkT;karfjd mi;ksxdrkZvksa ds fy, VsyhehVjh vko';d gSA ,sls jkT;karfjd mi;ksxdrkZ okbl ,aM MkVk dE;wfuds'ku fLLVe ds fy, vko';d lqfo/kk,a rFkk vkWu ykbZu lapkyu MkVk] tSl& oksYVst fYDosalh] Hkkj izokg vkfn miyC/k dj,axsA jkT; ikjs"k.k miØe vFkok ikjs"k.k vuqKfIr/kkjh] tSl Hkh fLFkfr gks bu lqfo/kkvksa ds fy, v/kkslajpuk&lqfo/kk,a] jkT;karfjd mi;ksxdrkZ ds O;; ij izfr"Bkfir djsaxsA
- 4-5-6 LVs'ku lfoZl yksM esa vyx Vs fyEkhVjh dh vko';drk gksxh ;fn og fHkUu yksM daV^aksy {ks= ls vkrk gSA ,uthZ $\frac{1}{4}$ kw, kwh, KvAr, Kvarh,oksYVst $\frac{1}{4}$ kv $\frac{1}{2}$] ,fDVo o fj,fDVo ikoj rFkk vU; isjkehVIZ tSl cszdj] LVsV~l o daV^aksy vkfn dh telemetry lkekU;r% vko';d gSA
- 4-6 lqj{kk%&
- fxzM ds varj la;kstu fcUnq ij ,d vkbZlksysfVax fMokbZl] $\frac{1}{4}$ vkbZlksysVj@ fMldusDV fLop $\frac{1}{2}$ miyC/k djuk gksxk] tks ifj;kstuk $\frac{1}{4}$ izkstsDV $\frac{1}{2}$ ls fxzM dks HkkSfrd $\frac{1}{4}$ physically $\frac{1}{2}$:i ls vyx djrk gSA vkbZlksysfVax fMokbZl dh lqj{kk rFkk vkijsfVax izfØ;k vf/kfu,e dh /kkjk $73\frac{1}{4}$ lh $\frac{1}{2}$ ds varxZRk izkf/kdj.k }kjk mYysf[kr lqj{kk ekudksa ds vuqiky ds vuqlkj gksaxsA vkbZlksysfVax fMokbZl] jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ rFkk izHkkfor i{kdkjksa dh lgefr ls baVjdusD'ku ikbZaV ds LFkku ls vyx txg LFkkr fd;s tkuk pkfg;sA fdlh Hkh n'kk esa] fMokbZl %
1. varjkZT;h; mi;ksxdrkZ ds ifj;kstuk $\frac{1}{4}$ izkstsDV $\frac{1}{2}$ ds leLr Qstst $\frac{1}{4}$ xsax vkijVsM $\frac{1}{2}$ dks ,d gh le; esa ,d lkFk [kqyuk pkfg;s(
 2. jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ }kjk lqyHk@lqxe $\frac{1}{4}$ accessible $\frac{1}{2}$ rFkk vYVhesV ,l-,y-Mh-lh- ds vf/kdkj {ks= ds varxZr gksuk pkfg;s(
 3. ,l-Vh-;w- }kjk [kqyh fLFkfr $\frac{1}{4}$ vksiu iksft'ku $\frac{1}{2}$ esa ykWdscy gksuk pkfg;s(
 4. mHk;i{kdkjksa dks vfxze lwpuk fn, fcuk vkijV ugh fd;k tkuk pkfg;s tc rd fd vkikrdky dh ,slh fLFkfr u gks] fd izkstsDV dks vkbZlksysV vR;ar vko';d

gks tk,(

5. mi;ksx dh fLFkfr esa lqj{kr izpkyu ds fy, mi;qDr gksuk pkfg;s(rFkk

6. bls [kqyh fLFkfr $\frac{1}{4}$ iksft'ku $\frac{1}{2}$ esa ,l-Vh;-w- dkfeZdksa }kjk rkyk rFkk lqj{kk iVy $\frac{1}{4}$ cksMZ $\frac{1}{2}$

yxk;k tkuk pkfg;s tcf %&

(i) fM&butkZbZTM lfdZV ij dke djrs le; la/kkj.k dkfeZdksa dh lqj{kk ds

fy, ;fn vko';d gks ;

(ii) ;fn izkstsDV] varjkZT;h; mi;ksxdrkZ] vFkok ,l-Vh;-w- ds midj.k [krjukd

fLFkfr iSnk djrs gksa;

(iii) ;fn izkstsDV] varjkZT;h; mi;ksxdrkZ] vFkok ,l-Vh;-w- ds midj.k fxzM ds

izpkyu esa ck/kk iSnk djrs gksa ;

(iv) ;fn fxzM] izkstsDV] varjkZT;h; mi;ksxdrkZ] ds izpkyu esa ck/kk iSnk djrh

gksA

pwaFd fMokbZl izFker% lqj{kk ds fy, gS vkSj yksM djsaV esa lkekU;r% vkijSV ugha djrk] vr%

fMokbZl dh {kerk] [kksyus dh izfØ;k rFkk mlds yxkus ds LFkku ij fopkj vo'; fd;k

tkuk pkfg;sA

4-7 vU; fopkj.kh;

wfuV ds fxzM ls ls ls la;kstdrk

vko';drkvksa ds vuq;i gksuk pkfg, A

leLr iz.kkyh bl izdkj ls fMtkbZu dh tkuh pkfg;s ftlls vf/kdre oksYVst osfj,s'ku

\$@& 5%rFkk 400 ds-Ogh- iz.kkyh ds fy, QkYV ysoy 40 ds-,- $\frac{1}{4}$ fdyks ,fEi;j $\frac{1}{2}$ gksA

fYDosalh osfj,'ku \$3 ls &5%rFkk midj.k 50° ls fYl;l ds okrkj.k esa Hkh dke djus gsrq

mi;qDr gksA

$\frac{1}{4}$ 1 $\frac{1}{2}$ tujsVj ds fy,%

oksYVst osfj,'ku	$\pm 7-5\%$ fu/kkZfjr ikWoj QsDVj ij fujarjA Reduced MVA operation at 110% of rated voltage
fYDosalhosfj,'ku	47-5 gV~tZ ls 51-5 gV~tZ
dEckbZUM oksYVst o fYDosalh osfi,'ku	$\pm 5\%$
ikWoj QsDVj osfj;s'ku	0-85 $\frac{1}{4}$ ySx $\frac{1}{2}$ ls 0-95 $\frac{1}{4}$ yhm $\frac{1}{2}$
vlarqfyr yksM esa lapkyu tSlk fd	vkbZ-bZ-lh-34&l esa mYysf[kr

'kkVZ lfdZV vuqikr	vkBZbZlH 34&1 ds vuqlkj
vuflesV ^a hdy 'kkVZ lfdZV esa lapkyu	Negative sequence current I_2 expressed in per unit of rated current for a duration of 't' second as in compliance value $(I_2)_{2t}$, IEC 34-1
oksYVst osc QkWeZ	vkBZbZlH 34&1 esa mYysf[kr lhek ds Hkhrj dgy gkeksZfud QsDVj Vh,p,Q(Total harmonic factor)A
'kkV lfdZV foFkLVs dsisflVh	fu/kkZfjr MVARFkk ikoj QsDVj ij 5 izfr'kr over voltagedh fLFkfr esa de ls de 3 second dh vof/k ds fy;s 3 phase short circuit generator terminal ij width standing {kerk lfgr
fo'ks"K lapkyu 'krsZ	QkWLV fjDyksftax gkbZ oksYVst ykbZu] V ^a kalfe'ku ykbZu Lohfpax] QkWYV] vkWijs'ku rFkk Qst flUØksukbts'ku vkfn c nkSjku fufeZr bysfDV ^a dy esdsfudy rFkk FkeZy LV ^a sl lgu dju .kX.
ykbZu pkftZx ;ksX;rk	'kwU; ikoj QsDVj ij fu/kkZfjr ,eoh, ds 30 izfr'kr ls de ughA

$\frac{1}{2}$,DlkbVs'ku iz.kkyh ds fy, %

- (i) y{k.k $\frac{1}{4}$ Characteristic $\frac{1}{2}$ % ,DlkbVs'ku iz.kkyh esa la;a= ds vU; lkFk larks"ktud lekukarj $\frac{1}{4}$ isjsy $\frac{1}{2}$ vkWijs'ku ds fy;s mi;qDr eSfpax y{k.k gksuk pkfg;s A

- (ii) midj.k fMtkbu ,oa lkbftax ekun.M %

$\frac{1}{2}$	lkekU;	tc tujsVj esa fu/kkZfjr ikWoj QsDVj ij jsVsM vkmViqV vpkud de gksus yxs rks iz.kkyh esa ux.; le; (negligible time)ds Hkhrj ukWfeuy izh lsV oksYVst osY;w ds 2% ds vanj oksYVst cgkyh dh {kerk gksuh pkfg;s rkfd izksVsD'ku midj.k pkyw u gksA
Ckh $\frac{1}{2}$	vkBZ-bZbZbZ 421&, ds vuqlkj ,DlkbVs'ku flLVe flLlkal VkhZe	0-5 lsd.M ls de
lh $\frac{1}{2}$	,DlkbVs'ku flLlkal	2 ls vf/kd
Mh $\frac{1}{2}$	,DlkbVs'ku flLVe lhafvx oksYVst	fu/kkZfjr yksM ,DlkbZVs'ku oksYVst ds 1-5 xqus ls vf/kd
bZ $\frac{1}{2}$	QhYM QksflZax {kerk $\frac{1}{4}$ Field forcing capability $\frac{1}{2}$	izR;sd,DlkbZVs'ku flLVe pSuy dks 10 lsd.M dh vof/k ds fy; QhYM QksflZax oksYVst o flLVe ds djsaV dks rki dh lhek ds vanj $\frac{1}{4}$ without exceeding limit of temperature $\frac{1}{2}$ fcuk fdLH Hkkx dks {kfr igqapk;s vkiwfrZ l{ke gsrq gksuk pkfg;s A
,Q $\frac{1}{2}$	ikWoj flLVe LVscykbjt	ikWoj flLVe LVscykbjt $\frac{1}{4}$ ih,l, $\frac{1}{2}$ dks ifjofrZr tujsVj yksfMax o ikWoj flLVe usVodZ ds varxZr leLr 0 ls 3 gV~Zt fQzDosalh jsat esa bysDV ^a ks esdsfudy vkWflys'ku ds fofHkUu ekWMy dh MsfEiax ds fy;s mi;qDr gksuk pkfg;sA ih-l,-l- dks tujsVj ds ckgjh fj;sdVsa'k $\frac{1}{4}$ external reactance $\frac{1}{2}$ ds igpku ds mi;qDr Ldhe lfgr vkWIVhee LVscykbftax ladsr dEI;wV djus ds QhplZ lfgr osfj;ax vkWijsfVax dfM'ku ds vuqdwy gksuk pkfg;s A fjeksV@esU;wvy fLop
		bUMhds'ku ds lkFk gksuh pkfg;s A vkWVksesfVd lqijfotu rFkk Cykfdax@fLop vkWO lqfo/kk l bafMds'kUl vkfn ds lkFk miyC/k

Tkh $\frac{1}{2}$	jksVj ,axy fyfeVj	iz.kkyh esa rotar angle limiteryxk gksuk pkfg;s bls ,DlkbVs'ku leUo; }kjk e'khu ds MkW;jsDV v{k (axis)rFkk usV work vectord e;/ dks.k dks fLFkfr (stabilizer) ds fu/kkZfjr lanHkZ eku ds Hkhrj j[kus esa dke vkosxkA
,p $\frac{1}{2}$	LVsVj djsaV fyfeVj	LVsVj djsaV fyfeVj dks vaMj ,DlkbVsM jsat esa vfoyac dk;Z djuk pkfg;s A vaMj ,DlkbVsM jsat esa le; foyac ls e'khu esa vLFkbbZ :i ls vksoi vkosfMax gksxhA
vkBZ $\frac{1}{2}$	vkBZ $\frac{1}{2}$ jksVj djsaVfyfeVj	le; foyac ds lkFk regulator dks dke djuk pkfg;s] rkfd fault dh n'kk esa regulation dynamics esa deh u gks
ts $\frac{1}{2}$	oksYVst fYDosalh $\frac{1}{4}$ oh@,ptsM $\frac{1}{2}$ fyfeVj	lhkhvkWijsfVax daMh'ku ij tujsVj oksYVst o fYDosalh dk vuqikr osY;w bl izdkj lhfer j[kuk rkfd vf/kdre tujsVj V ^a kalQkeZj dh dksj ¶yDl MufLVh mVysfkr eku ls vf/kdre gksA
ds $\frac{1}{2}$	,poh fLop ;kMZ fuEufyfj	kr iSjkehVj ds fy;s mi;qDr gksuk pkfg;s
i)	i) fLVe dk ,Dl@vkj vuqikr	14
ii)	ii) fMtk;u chvkbZ,y $\frac{1}{4}$ csfld bUlwys'ku ysoy $\frac{1}{2}$	400 KV@1425 KVP 220 KV@1050 KVP 132 KV@650 KVP
iii)	iii) ykbVax vjsLVj oksYVst jsfVaxKVrms esa	400 KV336] 220 KV 198] 132 KV 120]
iv)	iv) lqj {kk $\frac{1}{4}$ protection $\frac{1}{2}$ dh	vkmVxksbax ykbZuksa ij esu 1 o esu&2 fMLVsal izksVsD'ku
v)	v) ehVfjax dh vko';drk	0-2s,D;wjslh ehVfjax class
vi)	yksM 'ksfMax] vkbZysafMax dh	vko';d gS
vii)	vFkZ eSV fMtkbu	40 fdyks ,fEi;j ,d lsd.M

jkT; ikjs" k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ iz.kkyh $\frac{1}{4}$ fLVe $\frac{1}{2}$ esa fo|qr midj.k tSls V^akalQkeZj ikWoj lfdZV czsdj] fMldusDV fLop] vjsLVj rFkk ykbZu dMaDVj vkfn iz.kkyh ds foLrkj ds :i esa bl izdkj yxk;k tkuk pkfg;s tSls nh?kZdkfyd ;kstuk ds :lk esa fpfUgr fd;s x, gksaA ;fn u, tusjsfVax la;a= ds bUVjdusD'ku ds dkj.k midj.k de {kerk ds $\frac{1}{4}$ v.Mj&jsVsM $\frac{1}{2}$ gks tkrs gSa rks mUgsa vo'; cnyk tk,A

iz.kkyh LFkfkf;Ro ,oa fo'oluh;rk %

O;o/kku $\frac{1}{4}$ fMLVjesU $\frac{1}{2}$ ds nkSjku iz.kkyh dh LFkfkf;Ro ,oa fo'oluh;rk ds fy;s lko/kkuhiwoZd fopkj dj jkT; ikjs" k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ }kjk iz.kkyh fodflr dh tk,A izkstsDV vkdkj $\frac{1}{4}$ lkbZt $\frac{1}{2}$] czsdj dk dkWufQxjs'ku] tujsVj djsDVjfLVd rFkk izksVsDVo fjys dks lsV djus dh {kerk dk izHkko bl ij fuHkZj djsxk fd bUVjdusD'ku ikWbUV dks dSls cuk;k x;k gSA

izkstsDV dks fo'ks" k lqj {kk ;kstuk $\frac{1}{4}$ jsesfM;sy ,D'ku $\frac{1}{2}$ tSls yksM M^akfiacesa Hkkx ysus dh vko';drk gksxhA

fu;a=.k ,oa lqj {kk $\frac{1}{4}$ Control & Protection $\frac{1}{2}$ % $\frac{1}{2}$ % $\frac{1}{2}$ % $\frac{1}{2}$ %

jkT; ikjs" k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$ dks vius protection relays, Oa control system dks

coordinatedjuk gksxkA rkfd oS;fDrd lqj {kk ,oa midj.kksa dh lqj {kk gks lds ,oa O;o/kku ds nkSjku lsok esa U;wure dehgksA izkstsDVb.VjdusD'ku esa lkekU;r% izksVsfDVo fjys rFkk@vFkok dUV^aksy Ldhe ds :ikarj.k $\frac{1}{4}$ ekWfMfQds'ku $\frac{1}{2}$ vFkok ifjo/kZu $\frac{1}{4}$,fM'ku $\frac{1}{2}$ dh vko';drk gksrh gS A u;k izkstsDV orZeku izksVsfDVo fjys ;kstuk ls esy [kkuk pkfg;sA bUVjdusD'ku ikbZaV ds vk/kkj ij dHkh&dHkh oksYVst V^akalQkeZj $\frac{1}{4}$ ohVh $\frac{1}{2}$] djsaV V^akalQkeZj $\frac{1}{4}$ lhVh $\frac{1}{2}$ vFkok ikbysV Ldhe $\frac{1}{4}$ V^akalQj fV^ai $\frac{1}{2}$ Hkh vko';d gksrk gSA

izs" k.k ,oa la/kkj.k $\frac{1}{4}$ Despatching and maintenance $\frac{1}{2}$ %

midj.k vkmVst o ck/kkvksa ds nkSjku Hkh ekSleh $\frac{1}{4}$ lhtuy $\frac{1}{2}$ rFkk nSfud ihd yksM dh fLFkfr esa Hkh ,l-,y-Mh-lh- fo'oluh; miHkksDrk lsok nsus gsrq iz.kkyh $\frac{1}{4}$ fxzM $\frac{1}{2}$ dk la/kkj.k djrs gSaA izkstsDV ,dhdj.k esa ;g vko';d gksrk gS fd bUVjdusD'ku ikWbZUV ij yxs midj.k timely outage coordination, automatetime switching equipment maintenance rFkk scheduleesa ck/kk u igqapk,A fo'oluh; lsok cuk;s j[kus ds fy, b.VjdusD'ku ikbaV ij] vfrfjDr fLopfx;j] midj.k fjMuMsalh vFkok ckbZikl dsisfCkfyVh tks fLVe lapkyu ds fy, ekU; gks] dh vko';drk gks ldrh gSA

;fn ,l-,y-Mh-lh- }kjk visf{kr gks rks vf/kdre miyC/k fj,fDVo {kerk rd vkiwfrZ rFkk@vFkok tujs'ku Lrj dks leaftr djus ds fy, bls 'kwU; rd de djus gsrq tujsVj ls vis{kk dh tkuh pkfg;s A ;g ges'kk vR;ko';d {k.kksa esa dsoy fo'oluh;rk gsrq gksxk A

ok;qeaMyh; rFkk HkwdEih; fLFkfr;kj $\frac{1}{4}$ Atmospheric and Seismic conditions $\frac{1}{2}$ % $\frac{1}{2}$ % $\frac{1}{2}$ % $\frac{1}{2}$ %

vka/kh&rwQku] ck<+] vfr'k; xehZ] fctyh fxjus] ,yhos'ku rFkk Hkwadi ls mRiUu izHkko ij Hkh izkstsDV ds fMtkbZu o lapkyu ij fopkj djuk pkfg;sA jkT;karfjd mi;ksxdrkZ dk nkf;Ro gS fd og mi;qDr ekud] lafgrk] ekun.M] izFkk] ekxZn'kZd rFkk prudent utility practicesdk vuqikyu vfuok;Zr% lqfuf'pr djsxkA

4-8 sM~;wYl $\frac{1}{4}$ site responsibility schedule $\frac{1}{2}$ %

4-8-1 izR;sd ikjs" k.k iz.kkyh la;kstu gsrq lh-bZ,- ds fofu;e rFkk vk;ksx }kjk vkciu ,Dlsl fofu;e esa nf'kZr foLr'r izfØ;k $\frac{1}{4}$ fMVsy izkslhtj $\frac{1}{2}$ ds vuqlkj LFky ftEesnkjh lkj.kh $\frac{1}{4}$ lkbV jsLikfUlfefyVh $\frac{1}{2}$ 'ksM~;wy rS;kj fd;k tk,xkA

4-8-2 ,d js[kh; ekufp=

(i) ,l-Vh-;w- rFkk ,l-,y-Mh-lh- dks mi;ksxdrkZ }kjk izR;sd la;kstu fcUnq $\frac{1}{4}$ dusD'ku ikbaV $\frac{1}{2}$ ds fy;s ,d js[kh; ekufp= izLrqr djuk gksxkA bl ekufp= $\frac{1}{4}$ Mk;xzke $\frac{1}{2}$ esa leLr ,p-oh-@bZ-,p-Ogh- ls tqM+s midj.k rFkk ckg~; $\frac{1}{4}$,DIVjuy $\frac{1}{2}$ lfdZV ls tqM+s lHkh dusD'ku lfEefyr gksaxs rFkk ffilesa budh uEcifax] ukeuDyspj o yscfyax vkfn 'kkfey gksaxhA ekufp= dk mn~ns'; ys&vkmV rFkk lfdZV dusD'ku] jsafVx] uEcifax] ukeuDyspj ,p-oh-@bZ-,p-oh- vijsVl o lacaf/kr la;a= ds okLrfod fjdkMZ dks iznf'kZr djuk gksxkA

(ii) tc dHkh Hkh fdlh midj.k dks cnys dh t:jr iM+sxh] rc lacaf/kr jkT;karfjd mi;ksxdrkZ jkT; ikjs"k.k miØe ¼,l-Vh;-w-½ vkSj leLr lacaf/kr ykxksa dks vko';d
cnyko dh tkudkjh vfuok;Zr% nsxh A tc ifjorZu dj fy;k tkosxk] rc jkT;karfjd mi;ksxdrkZ }kjk] ifjofrZr flaxy ykbu Mk;xzke] ,l-,y-Mh-lh-@,l-Vh;-w- dks izsf"kr djuk vfuok;Z gksxkA

LFky LkekU; js[kkfp= ¼Site common drawing½

¼i½ izR;sd dusD'ku ikbaV ds fy;s LFky lkekU; js[kkfp= rS;kj djuk gksxk ftlesa LFky ys vkmV] fo|qr ys&vkmV] lqj {kk dh rFkk dkWeu lsok M^akbox 'kkfey gksaxsA ,lVh;w dks jkT;karfjd mi;ksxdrkZ vko';d C;kSjk vfuok;Zr% nsxk A

¼ii½ izR;sd dusD'ku ikbaV gsrq jkT;karfjd mi;ksxdrkZ rFkk jkT; ikjs"k.k miØe ¼,l-Vh-;w-½@ikjs"k.k vuqKfIr/kkjh dks vius&vius Hkkx ds fy;s foLr`r js[kkadu ¼detailed drawing½ rS;kj djuk gksxk rFkk mls mi;ksxdrkZ o jkT; ikjs"k.k miØe ¼,l-Vh;-w-½ ds chp vknku&iznku djuk gksxkA

¼iii½ vko';drk iM+us ij ;fn M^akbox esa dksbZ ifjorZu fd;k tkrk gS rks mldk ;Fkk'kh?kz mi;ksxdrkZ vkSj jkT; ikjs"k.k miØe ¼,l-Vh;-w-½ ds e/; vknkuiznku vfuok;Zr% djuk gksxk A

4-9 iz.kkyh fu"iknu ¼system performance½%

4-9-1 ikjs"k.k iz.kkyh ls tqM+s leLr midj.kksa dk fMtkbZu o fuekZ.k izklafxd Hkkjrh; ekud fofunsZ'kksa ¼ISI½ ds vuq;i vfuok;Zr% gksuk pkfg;s A midj.k ftlds fy;s Hkkjrh; ekud fofunsZ'k miyC/k ugha gS] ogka mi;qDr vkbZlh] vFkok vkbZ-bZ-bZ vFkok varjkZ"V^ah; ekud vfuok;Zr% ykxw gksaxs A

4-9-2 leLr fo|qr midj.kksa dh LFkkiuk dsUnzh; fo|qr izkf/kdj.k ds ekun.Mksa@fofu;eksa ds vuqlkj vfuok;Zr% gksuk pkfg;s] tks fd fQygy izpyu esa gSa] rFkk Hkfo"; esa uohu ekun.Mksa@fofu;eksa ds vuqlkj izfrLFkkiuh; gksaxsA

4-9-3 ikjs"k.k vuqKfIr/kkjh izR;sd u;s dusD'ku gsrq dusD'ku ikbaV@b.VjQsl ikbUV rFkk ehVfjax dksM esa ;Fkk mYysf[kr visf{kr ehVfjax vko';drkvksa ds lkFk vkiwfrZ oksYVst dk Li"V mYys[k djsxkA

4-9-4 i;Zos{k.k fu;a=k ,oa MkVk ,fDof'tku ¼,l

ikjs"k.k vuqKfIr/kkjh vkWijs'kuy ehVfjax MkVk ds dysD'ku Hk.Mkj.k] izn'kZu rFkk MkVk ds izkslsl gsrq ,l-lh-,-Mh-,- ds varxZr ,d iz.kkyh yxk;sxk rFkk mls izpkfyr djsxk A leLr jkT;karfjd mi;ksxdrkZ vius&vius vkWijs'kuy ehVj ds vkmViqV dks ,l-lh-,-Mh-,- b.VjQsl midj.k esa ,l-,y-Mh-lh- esa iznZ'ku gsrq miyC/k dj;ksaxsA

4- visf{kr lqj {kk ¼Protection requirement½%½%½%½%

1010 jkT;karfjd mi;ksxdrkZ rFkk ikjs"k.k vuqKfIr/kkjh] dsUnzh; fo|qr la;kstdrk ds fy, rduhdh ekun.M½ fofu;e] 2007 ds Hkkx&1 esa fofufnZ"V fxzM la;kstdrk gsrq lqj {kk iz.kkyh rFkk leUo; dk vuqiky djasxsA mUgsa dsUnzh; fo|qr izkf/kdj.k ¼fo|qr'gksa rFkk fo|qr ykbZuksa ds fuekZ.k gsrq

rduhdh ekun.M $\frac{1}{2}$ fofu;e] 2010 dh vuqlwph esa of.kZr lqj{kk dk;kZs dk vuqiky Hkh djuk gksxk A budk o.kZu bl lafgrk ds lqj{kk lafgrk laca/kh v;/k; esa Hkh fd;k x;k gSA

4- ehVfjax vko';drk,a %

1111 ikT: ikis"k.k iz.kkvh ds mi:ksxdrkZ dks bl lafgrk ds v:/k:&8 esa n'kkZ:h ehVfjax lafgrk iz;ksT; gksxhA ehVjksa ds izfr"Bkiu rFkk lapkyu laca/kh vko';drk,a vf/kfu;e dh /kkjk&55 ds varxZr dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ ehVjksa dk izfr"Bkiu vkSj lapkyu $\frac{1}{2}$ fofu;e] 2006 rFkk bls la'kksf/kr fofu;e] 2010 ds vuq:i gksaxh] ehVj dk LFkku $\frac{1}{4}$ yksds'ku $\frac{1}{2}$ le;≤ ij ;Fkk la'kksf/kr lh-,l-bZ-vkj-lh- $\frac{1}{4}$ la;kstdrk rFkk jkT;karfjd vksiu ,Dlsl $\frac{1}{2}$ fofu;e] 2011 ds izko/kkuksa ds vuq:i jgsxhA

4-12121212 izfrfØ;kRed ikWoj {kfriwfrZ%

4-12-1 tgka rd laHko gks lds vf/kd vkSj de oksYVst ls izHkkfor gksus oksy {ks=ksa esa jkT;karfjd mi:ksxdrkZvksa }kjk izfrfØ;kRed ÅtkZ {kfriwfrZ vkSj@vFkok vU; lqfo/kk,a miyC/k djkuh pkfg, ftlls jkT;karfjd ikjs"k.k iz.kkyh $\frac{1}{4}$ baVjk ,l-Vh-,l- $\frac{1}{2}$ ls@dks izfrfØ;kRed ÅtkZ ds vknku&iznku dh vko';drk ls cpk tk lds vkSj lHkh le; ij jkT;karfjd ikjs"k.k iz.kkyh ds oksYVst dks fofufnZ"V lhekvska ds Hkhrj cuk, j[kk tk ldsA jkT;karfjd mi:ksxdrkZ rFkk jkT; ikjs"k.k miØe }kjk lqfufpr fd;k tk,xk fd jh;y VkbZe esa vko';drk ds vuqlkj iz.kkyh dk LoLFk lapkyu fd;k tk ldsA

4-12-2 la;kstu vuqca/kksa ds izko/kkuksa ds Hkhrj vLFkbbZ vksoj oksYVst dks fu;af=r djus ds fy, ykbZu fj,DVj yxk, tk ldsaxsA

4-12-3 jkT;karfjd mi:ksxdrkZ }kjk la;kstdrk ds nkSjku miyC/k djkbZ tkus okyh izfrfØ;kRed {kfriwfrZ] ;fn dksbZ gks rks mls jkT; ikjs"k.k miØe }kjk vuqiky ds fy, la;kstu vuqca/k esa mYysf[kr fd;k tk,xkA

4-12-4 laiw.kZ fxzM esa leLr 400KV cl rFkk ykbZu fj,DVj ds fLofpax bu@vkmV jkT; Hkkj izs"k.k dsUnz ds funZs'kksa ds vuqlkj fd;k tkuk pkfg,A 400KV/220KV ds leLr baVj dusfDVax V^akalQkeZjksa ij Vsi ifjorZu $\frac{1}{4}$ psafax $\frac{1}{2}$ Hkh jkT; Hkkj izs"k.k dsUnz ds funZs'kksa ds vuqlkj fd;k tkuk pkfg,A

4- izeknh $\frac{1}{4}$ viko/kku $\frac{1}{2}$ izokg %

1313 ¶vksfVax VkbZ&vkbu ds lkFk tc nks iz.kkfv:ka lekUri dk:Z $\frac{1}{4}$ vkWiisV $\frac{1}{2}$ iSjkehVj ds MkW;usfeDl ds dkj.k VkbZ ykbZu dks iw.kZr;% ¶yksfVax djuk laHko ugha gksrkA Qyr⁰ mlesa ,d iz.kkyh ls nwljs iz.kkyh dks ,uthZ ¶yks gksxkA ÅtkZ ds ,sls bu,MojVsaV ¶yks dhs okf.kfT;d fcfyax ds mn~ns'; gsrq x.kuk dh tkuh pkfg,A

4-14141414 vkosnu fujLr djus dk vf/kdkj%&

4-14-1 dksbZ viw.kZ vkosnu] vkSj@vFkok ,slk vkosnu tks vk;ksx }kjk vuqeksfnr fofu;eksa izfØ;kvksa ds vuq:i u ik;k tk,] fujLr dj fn;k tk,xkA

fuEufyf[kr 'krksZa ds varxZr ikjs"k.k iz.kkyh dks mi:ksx djus rFkk@vFkok dusD'ku gsrq fdll Hkh vkosnu dks ikjs"k.k vuqKflr/kkjH fujLr dj ldrk gS%

1- ;fn izLrkfor la;kstu ikjs"k.k vuqKflr ds fdlh Hkh mica/k dk mYya?ku djrk gSA

2- ;fn vkosnu esa izLrkfor dk;Z] vuqKflr/kkjh $\frac{1}{4}$ ykblsalh $\frac{1}{2}$ ds dk;Z {ks= ds Hkhrj ugha vkrk gS vFkok vf/kfu;e dh /kkjk 177 ds varxZr dsUnzh; fo|qr izkf/kdj.k ds fofu;e rFkk fxzM lafgrk ds mica/kksa ds vuq;i ugha gSaA

3- iz.kkyh {kerk ;fn vuqefr ugha nsrh gSA

4-14-2 oS/k vof/k ds vanj izLrko voS/k gksus vFkok fujLr gksus dh n'kk esa la;kstu vkosnu ij jkT; ikjs"k.k miØe@ikjs"k.k vuqKflr/kkjh }kkj rc rd dksbZ dk;Zokgh ugh dh tk,xh] tc rd fd ewy vkosnu ls gVdj dksbZ Bksl ckr iz.kkyh ifjorZu ds laca/k esa ugha gksA

4-15151515 la;kstu vuqca/k%

4-15-1 tSlk fd 'krksZa vkSj n'kkvksa esa leqfpr gks] miHkksDrk ds jkT; ikjs"k.k iz.kkyh ls vFkok ikjs"k.k vuqKflr/kkjh ds la;kstu vuqca/k esa fuEufyf[kr tkudkjh lfEefyr gksxh%

(i) fxzM lafgrk] ,l-bZ-vkj-lh- }kkj fofufnZ"V Hkkjrh; fo|qr fxzM lafgrk] ;fn iz;ksT; gks] vkSj lh-bZ-,- }kkj fxzM la;kstdrk] lqj {kk vkSj laj {kk laca/kh vf/klwfpr vU; fofu;e ds nksuksa i {kdkjksa }kkj vuqiky ds laca/k esa 'krZ(

(ii) la;kstu dk fooj.k rduhdh okaNk,a vkSj okf.kfT;d vuqca/k(

(iii) vko';d mUu;u $\frac{1}{4}$ jhbUQkslZesaV $\frac{1}{2}$ vFkok iz.kkyh ds foLrkj ls mn~Hkwr fdlh iwath O;;] MkVk dE;wfuds'ku vkfn dh vko';drk rFkk budk lacaf/kr i {kdkjksa ds chp lhekadu laca/kh fooj.k(

(iv) lkbZV mRrjnkf;Ro vuqlwph (

(v) laj {k.k $\frac{1}{4}$ izksVsD'ku $\frac{1}{2}$ ij lkekU; n'kZu $\frac{1}{4}$ fQyklkWfQ $\frac{1}{2}$ vkSj fn'kk funZs'k(

(vi) laj {k.k iz.kkyh(

(vii) flLVe fjdKfMaZx ds midj.k(

(viii) lapkj lqfo/kk,a(

(ix) dksbZ vU; tkudkjh tks jkT; ikjs"k.k miØe vFkok vk;ksx }kkj mfpr le>h tk,aA

4-15-2 jkT; ikjs"k.k miØe }kkj NRrhlx<+ jkT; fo|qr fu;ked vk;ksx $\frac{1}{4}$ la;kstdrk rFkk jkT;karxZr [kqyh ,Dlsl $\frac{1}{2}$ fofu;e] 2011 esa mYysf[kr vuqlkj ,d vkn'kZ la;kstu vuqca/k fodflr fd;k tk,xkA jkT; ikjs"k.k miØe varjkZT;h; ikjs"k.k iz.kkyh ls ubZ ifj;kstuvksa ds varj la;kstu dh izxfir ds ckjs esa vfxzetkudkjh dsUnzh; ikjs"k.k miØe dks nsxk flls og ehVjksa ds izfr"Bkiu] LdkMk MkVk baVhxzs'ku] Lihp ,aM izksVsD'ku vkfn ds laca/k esa leUo; LFkkfir dj ldsA

&&000&&

v;/k;&5

lapkyu lafgrk 5-1

lapkyu uhfr%

$\frac{1}{4}1\frac{1}{2}$ jkT; fxzM ds ,dhd`r lapkyu dk izkFkfed mn~ns'; lexx lapkyu ferO;f;rk ,oa laiw.kZ fo|qr ikWoj usVodZ] tks jkT; ds foLr`r HkkSxksfyd {ks= esa QSyk gqvk gS] dh fo'oluh;rk dk foLrkj djuk gSA ikjs"k.k iz.kkyyh dk lapkyu bZ-vkbZ-th-lh-] 2010 vkSj bls :ikarj.k] ;fn dksbZ gksa] ds laxr ds vuqlkj fd;k tk,xkA rFkkfi jkT;karfjd mi;ksxdrkZ ,l-,y-Mh-lh- }kjk fofgr fxzM vuq'kklu ds varxZr jgsaxsA

$\frac{1}{4}2\frac{1}{2}$ jkT; fxzM dk lexx le; (Overall real time) lapkyu jkT; Hkkj izs"k.k dsUnz $\frac{1}{4},l-,y-$ Mh-lh- $\frac{1}{2}$ }kjk ifjof{kr gksxkA ,l-,y-Mh-lh- ,oa ,l-Vh-;w- dh Hkwfedk vf/kfu;e rFkk lh-,l-bZ-vkj-lh- $\frac{1}{4}$ la;kstdrk rFkk jkT;karfjd vksiu ,Dlsl $\frac{1}{2}$ fofu;eu] 2011 ds mica/kksa ds vuqlkj gksxhA leLr jkT; gLrh $\frac{1}{4}$ bdkbZ;ksa $\frac{1}{2}$ $\frac{1}{4}$ buVkbVh $\frac{1}{2}$] ,dhd`r lapkyu ls vf/kdre ykHk izkIr djus gsrq bu lapkyu funZs'kksa dk vuqiky djsaxs o nkf;Roksa dk leku :i ls fuokZg djus ds fy, ,d nwljs ds lkFk leUo; djsaxsA izR;sd mRiknu daiuh vkSj ikjs"k.k vuqKfIr/kkjH vius daV^aksy :e esa izR;sd midj.k ds lapkyu ds vuqØe dks n'kkZrs gq, lapkyu izfØ;k ds fyf[kr lapkyu funZs'k miyC/k dj,axsA ikyu fd, tkus okys lapkyu funZs'k midj.k fuekZrk ds funZs'kksa ls vlaxr ugha gksaxsA mRiknu daiuh vkSj ikjs"k.k vuqKfIr/kkjH] tSlh Hkh fLFkfr gks }kjk lapkyu funZs'k vkSj izfØ;k dks iqujhf{kr fd;k tk ldsxkA

$\frac{1}{4}3\frac{1}{2}$ jkT; Hkkj izs"k.k dsUnz $\frac{1}{4},l-,y-$ Mh-lh- $\frac{1}{2}$ }kjk jkT;karfjd gLr;ksa o vkj-,y-Mh-lh- ds ijke'kZ ls jkT; fxzM ds fy, vkarfjd foLr`r lapkyu izfØ;k fodflr vkSj la/kkfjr dh tk,xh] tks jkT; fxzM lafgrk rFkk vkbZ-bZ-th-lh-] 2010 vkSj bls la'kks/ku ls laxr gksxhA bu vkarfjd lapkyu izfØ;kvksa esa fuEufyf[kr dk lekos'k jgsxk%&

- (i) CySd LVkVZ izfØ;k,a-
- (ii) vk;ksx }kjk vuqeksfnr yksM 'ksfMax izfØ;k-
- (iii) vkbZySafMax izfØ;k-
- (iv) ,sls vU; izfØ;k tks jkT; Hkkj izs"k.k dsUnz }kjk leqfpr le>h tk,A jkT; Hkkj izs"k.k dsUnz }kjk rFkk {ks=h; Hkkj izs"k.k dsUnz }kjk Qksu] QSDI] bZ&esy] vkfn ds ek;/e ls fn, x, leLr lapkyu funZs'kksa dks ,d fof'k"V lapkyu dksM uacj fn;k tk,xkA jkT; Hkkj izs"k.k dsUnz }kjk VkbZe VSx vFkok LVkWEi ls gq, okrkZyki dks vfHkfy[kr rFkk iqu% mRikfnr djus ds fy, ,d okbl fdkMZj la/kkfjr djuk gksxkA bu funZs'kksa dk vfHkys[k U;wure N% efguksa rd j[kk tk,xkA

$\frac{1}{4}4\frac{1}{2}$,l-,y-Mh-lh-] dk fu;a=.k d{k] mRiknu la;a= vkSj vfr mPpnkc midUnz rFkk jkT; gLr;ksa ds vU; fdUgha fu;a=.k dsUnzksa ij pkSfclksa ?kaVs la/kkj.k vgZrk izkIr rFkk leqfpr izf'k{k.k mijkar O;fDr;ksa dh rSukrh gksxhA

5-2 iz.kkyyh lqj {kk ds igyw%

$\frac{1}{4}1\frac{1}{2}$ leLr jkT;karfjd mi;ksxdrkZ rFkk jkT; fxzM esa Hkkx ysus okys lHkh O;fDr gj le; vius&vius ikWoj iz.kkyyh o ikWoj dsUnz flaØksul gsrq ,d

nwljs ds lkFk bl izdkj flUØksukbt djsasaxsa fd iwjs jkT; esa lEiw.kZ
iz.kkyl ,d flaØksUkkbZTM iz.kkyl ds :i esa dk;Zjr~ jgsA

$\frac{1}{4}2\frac{1}{2}$ jkT; fxzM ls] fxzM dk dksbZ Hkh Hkkx tkucw>dj dnkfi vyx ugha fd;k
tk,xk] flok;%

(i) vikrdky o ,slh n'kk es tc vkblksys'ku lexx fxzM dks /oLr
 $\frac{1}{4}$ collapse $\frac{1}{2}$ gksus ls jksdrk gks rFkk@vFkok ikWoj vkiwfrZ dh cgkyh
'kh?kz djrk gks(

(ii) tc fdlh dherh midj.k dks cgqr cM+h xaHkhj {kfr laHkkfor gks
rFkk dsoy vkblksys'ku gh mls jksd lds(rFkk

(iii) tc ,slk vkblksys'ku fo'ks"kdj ,l-,y-Mh-lh }kjk vuqnsf'kr gksA

tSls gh ifjLFkfr vuqefr nsrh gS lEiw.kZ fxzM dk flaØksukbts'ku
cgkyh fQj ls ;Fkk'kh?kz dh tkuh pkfg,A ,l-,y-Mh-lh }kjk cgkyh izfØ;k
vyx ls rS;kj lapkyu izfØ;k ds vuqlkj i;Zosf{kr gksuh pkfg,A

$\frac{1}{4}3\frac{1}{2}$ jkT; fxzM ds mijksDr fdlh Hkh ,fyesaV dk pkgS og esuqvy vFkok
vVksesfVd gks dh dksbZ Hkh fV^afiar laca/kh lwpuk ,l-,y-Mh-lh- dks
lacaf/kr jkT;karfjd mi;ksxdrkZ }kjk ;Fkk'kh?kz dh tkuh pkfg,A bldk dkj.k
 $\frac{1}{4}$ tgkW rd vfHkfuf'pr fd;k x;k gks $\frac{1}{2}$ rFkk laHkkfor cgkyh dk le; Hkh lwfpr
djuk pkfg,A

$\frac{1}{4}4\frac{1}{2}$ leLr mRiknu bZdkbZ;ka] tks jkT; fxzM ds lkFk flUØksukbTM gS]
pkgS mudk LokfeRo] Vbki o lbt dqN Hkh gks] viuk xouZj lHkh le; lkekU;
lapkyu fLFkfr esa j[ksaxsa ;fn 50 esxkokV ls Åij ds fdlh tujsVj dks
lkekU; lapkyu esa fcuk xouZj ds pykbZ tkus dh vko';drk gks rks ,l-,y-Mh-lh-
dks rRdky ,sls lapkyu ds dkj.k vkSj mldh vof/k dh tkudkjh nsuh gksxhA
lHkh xouZj esa M^awi 3% ls 6% ds chp j[kk tk,xkA xouZj eqDr dk;Z ls
lacaf/kr leLr izko/kku] vkbZ- bZ-th-lh- eas miyC/k lqlaxr izko/kkuksa dh
laxfr esa gksaxs] tSls os le;≤ ij ;Fkk la'kksf/kr vf/kfu;e dh /kkjk&79
 $\frac{1}{4}$,p $\frac{1}{2}$ ds varxZr lh-bZvkj-lh- }kjk fofufnZ"V fd, tk,aA

$\frac{1}{4}5\frac{1}{2}$ yksM fyfeVj] vkVksesfVd VckZbu ju vi flLve $\frac{1}{4}$,Vhvkj,l $\frac{1}{2}$] VckZbu
lqijokbZtjh daV^aksy] dksvkWfMZusVj daV^aksy flLve vkfn esa fLFkr
lqfo/kk dk mi;ksx lkekU; xouZj ,D'ku dks fdlh Hkh rjg neckus gsrq
mi;ksx esa ugha ykuh pkfg;sA fdlh Hkh izdkj ls MsM cSaM
rFkk@vFkok Vbke fMys dks tkucw>dj 'kkfey $\frac{1}{4}$ b.V^aksM~;wt $\frac{1}{2}$ ugha djuk
pkfg;s A

$\frac{1}{4}6\frac{1}{2}$ leLr mRiknu bZdkbZ;ka vius vf/kdre fujarj jsfVax $\frac{1}{4}$,e-lh-vkj $\frac{1}{2}$ ds
100% / 100%rd] esa dk;Zjr~ gksa lkekU;r% 5% vfrfjDr yksM de ls de 5 feuV ds
fy, vFkok fuekZrk }kjk fu/kkZfjr rduhdh lhek esa c<+kus ds fy, l{ke
gksA tc fQzDosUlh vpkud fxj tkrh gS rks tujsfVax ;wfuV tks vius ,e-lh-
vkj- ds 100% ls vf/kd ij izpkyu dj jgh gks] mls de ls de vius ,e-lh-vkj- ds 105%
rd tkus ls ugha jksdk tkuk pkfg,A ,l-,y-Mh- ls vuqefr izklr djus ds ckn gh
50 esxkokWV lkbZt ls vf/kd ds fdlh Hkh tujsfVax ;wfuV] tks mijksDr

vko';drk ds lkFk dke ugha djrk] dks lapkyu esa j[kuk pkfg, $\frac{1}{4}$ vFkkZr jkT;
fxzM ds lkFk flaØksukbTM djuk pkfg, $\frac{1}{2}$ A rFkkfi] lapkyu bufVVh
rn~laca/kh 'kVZQky vius vU; tujsfVax ;wfuV ds fLiuhax ftoZ eSaVsu dj
iwjk dj ldrk gSA

$\frac{1}{4}7\frac{1}{2}$ leLr tujsfVax ;wfuV ds fy;s] pkgs mudk Vkbi o lkbt dqN Hkh gks] ds
fy;s xouZj lsfVax vFkkZr~ iwjd fu;a=.k vkmViqV $\frac{1}{4}$ tujs'ku ysoy $\frac{1}{2}$ c<+kus
;k ?kVkus gsrq vuq'kaflr nj ,d izfr'kr izfrfeuv vFkok fuekZrk }kjk nh xbZ
lhek ds vuqlkj gksxhA rFkkfi ;fn fYDosUlh 49-5Hz] ds uhps fxjrh gS]
rks leLr vkaf'kd yksMsM tujsfVax ;wfuV viuh {kerk ds vuqlkj rhoz nj
ij vfrfjDr yksM fidvi djsaxs A

$\frac{1}{4}8\frac{1}{2}$ flok; vkikrdky ds vFkok dkfeZd vFkok midj.k dks rRdky {kfr ls
jksdus] dksbZ Hkh bufVVh ,l-,y-Mh-lh- ds fcuk iwoZ vuqefr o lgefr ds
vius tujsfVax ;wfuV

ds vkmViqV dks vpkud 50 esxkokV ls vf/kd de ugh djsxk] fo'ks"kdj rc
tc fYDosalh fxj jgh gks vFkok 49-5 ;k lh-bZ0vkj-lh- }kjk tks le;≤ ij
fu/kkZfjr fd;k tk,] ds uhps gksA mlh rjg dksbZ ,UVkbZVh fcuk ,l-,y-
Mh-lh- ds iwoZ lwpuk o lgefr ds 50 esxkokV ls vf/kd vius yksM esa
vpkud o`f} ugha djsxk A

$\frac{1}{4}9\frac{1}{2}$ leLr tujsafVx ;wfuV mi;qDr lsfVax ds lkFk lkekU;r% vius&vius
vkVksesfVd oksYVst jsxqys'ku $\frac{1}{4}$,-oh-vkj- $\frac{1}{2}$ dk;Zjr~ j[ksaxsA
fo'ks"kdj] ;fn 50 esxkokV {kerk ls Åij ds tujsfVax ;wfuV dks ,-oh-vkj- ds
fcuk pkyw djus dh vko';drk gks rks ,l-,y-Mh-lh- dks blds dkj.k o le;kof/k
ds ckjs esa rRdky lwfpr fd;k tkuk pkfg;s] rFkk vuqefr vo'; izkIr djuh
pkfg;sA tujsfVax bdkbZ;ksa $\frac{1}{4}$ tgaka dgha miyC/k gks $\frac{1}{2}$ ds ,ohvkj esa
ikWoj fllVe bLVschykbZtlZ dks lacaf/kr mRiknu bdkbZ dk Lokeh
dsUnzh; ikjs"k.k miØe@jkT; ikjs"k.k miØe }kjk le;≤ ij bl gsrq cuk,
xbZ ;kstuk ds vuqlkj leqfpr :i ls V~;wfuax djsxkA dsUnzh; ikjs"k.k

miØe@jkT; ikjs"k.k miØe }kjk le;≤ ij vko';drk vuqlkj ikWoj fllVe
bLVschykbZtlZ dh tkap vkSj mudh vxzsrrj V~;wfuax dh vuqefr jgsxhA

$\frac{1}{4}10\frac{1}{2}$ laiw.kZ jkT; fxzM ij bl laca/k esa i`Fkd ls rS;kj ;kstuk ds vuqlkj
jkT; ikjs"k.k miØe }kjk leLr gflr;ksa $\frac{1}{4}$ bufVVhl $\frac{1}{2}$ ds leUo; ls lqj {kk
vkSj fjysl lsfVax dk dk;Z lkof/kd :i ls lefUor fd;k tk ldsxkA

$\frac{1}{4}11\frac{1}{2}$ fxzM fYDosalh lnSo 49-0&50-0Hz cSaM ds vanj vkbZ-bZ-th-
lh-]2010 tSlk fd le;≤ ij ;Fkk la'kksf/kr ds vuqlkj j[kus gsrq leLr
jkT;karfjd mi;ksxdrkZvksa dks gjlaHko iz;kl dj lqfufpr djuk pkfg;sA
rFkkfi] lh-bZ-,- ds rdudh ekun.Mksa ds vuqlkj tujsVj dks &5%ls \$3%
 $\frac{1}{4}47-5$ ls 51-5 $\frac{1}{2}$ fYDosalh jsat ds Hkhrj fxzM vko`fr ifjorZu $\frac{1}{4}$ osfj,'ku $\frac{1}{2}$ ds
varxZr ,e-lh-vkj- vkmViqV nsus dh lapkyu {kerk gksuh pkfg,A

$\frac{1}{4}12\frac{1}{2}$ leLr jkT;karfjd mi;ksxdrkZ vius&vius iz.kkyh $\frac{1}{4}$ flLve $\frac{1}{2}$ esa ,l-
Vh-;w- }kjk vyx ls fufeZr ;kstuk ds vuqlkj fYDosalh fMdykbu ftlls fxzM

esa O;o/kku@vla;ksftr gks ldrk gS] dks vjsLV djus gsrq vkWVksesfVd
 vaMj fYDosalh rFkk Mh,Q@MhVh@yksM 'ksafMax fjys miyC/k
 dj,axs] rFkk mldk izHkkoh fØ;kUo;u lqfuf'pr djsaxs] rkfd fdllh rjg dh
 dafVatsUlh dh n'kk esa tujsfVax ;wfuV esa dkLdsM fV^afiax ¹/₄cascaded
 tripping¹/₂ u gksA leLr jkT; bufVVh dks lqfuf'pr djuk pkfg;s fd vaMj
 fYDosalh o Mh,Q@ MhVh yksM 'ksafMx@vkbZ ySfMax Ldhe dk;Z'khy
¹/₄functional¹/₂ gS rFkk ,l-,y-Mh-lh- ls izkIr iwoZ lgefzr ds fcuk dksbZ
 Hkh vMaj fYDosalh fjys ckbikl vFkok gV;k ugha tkuk pkfg;s A

¹/₄13¹/₂ jkT;karfjd mi;ksxdrkZ] ikjs"k.k iz.kkyh dks mldh fu/kkZfjr lhek
 ds lehi dk;Zjr~ jgus gsrq izek.kh esa oksYVst] dksysll rFkk dkLdsfMax
 rFkk egRoiw.kZ dkjhMksj esa fV^afiax ls cpus gsrq iz.kkyh laj {kk ;kstuk
¹/₄flLVe izksVsD'ku fLde¹/₂ ¹/₄b.VjfV^afiax o ju csd lfgr¹/₂ ds
 vkbMsafVfQds'ku LFkkiuk rFkk deh'ku djus dh lqfo/kk ikWoj flLVe esa
 miyC/k dj, xkA bl ;kstuk dks ,lVh;w }kjk vafre :i fn;k tk,xk vkSj bls lnSo
 dk;Zjr~ esa j[kk tk,xkA ;fn buesa ls fdllh dks Hkh vkmV vkWQ lfoZl
 fd;k tkrk gS] rks ,l-,y-Mh-lh- dks rRdky bldk dkj.k rFkk laHkkfor cgkyh
 dk le; lwfpr dj ,l-,y-Mh-lh- ls vuqefzr ysuk gksxkA

¹/₄14¹/₂ lHkh tujsfVax ;wfuV ,pVh@,yVh ckbikl O;oLFkk tgka dgha
 Hkh miyC/k gks dk fØ;kUo;u lqfuf'pr djsaxs] rkfd de ls de ,d tujsVj bu
 gkAl yksM ds fy, miyC/k jgsA

¹/₄15¹/₂ fxzM ds vkaf'kd@lexz /oLr gks tkus ls mckjus dh izfØ;k ,l-,y-
 Mh-lh- }kjk] vkj-,y-Mh-lh- ds ijke'kZ ls dsUnzh; fo|qr izkf/kdj.k
¹/₄fxzM ekun.M] fofu;e] tSlk vkSj tc ls izHkko'khy gksa¹/₂ ds vuq:i fodflr
 dh tk,xh vkSj mls lkof/kd :i ls vkbZbZthlh fofu;e] 2010 dh /kkjk 5-8 esa nh
 xbZ vis{kkvksa ds vuqlj.k esa v|ru fd;k tk,xkA ;s izfØ;k,a laxr
¹/₄dafLVsaV¹/₂] fo'oluh;rk rFkk rRdky cgkyh lqfuf'pr djus gsrq lHkh
 jkT;karfjd mi;ksxdrkZvksa] jkT; ikjs"k.k miØe rFkk ,l-,y-Mh-lh- }kjk
 viukbZ tk,axhA

¹/₄16¹/₂ jkT;karfjd mi;ksxdrkZ rd fMLVcZsUl fjdkMZj@flDosufly
 bosaV fjdkMZj vkmViqV lfgr lwpuk@MkVk] fxzM fMLVjcsUl@?kVuk
¹/₄bosUV¹/₂ dk fooj.k] fo'ys"k.k djus ds fy;s ,l-,y-Mh-lh- dks HkstsxkA
 ?kVuk dk fo'ys"k.k djus ds fy;s rFkk fxzM dh lqj {kk o fo'olfu;rk cuk;s j[kus
 gsrq ,l-,y-Mh-lh- }kjk visf{kr dksbZ MkVk@lwpuk nsus ls jkT;karfjd
 mi;ksxdrkZ dnkfi bUdkj ugha dj ldrk A

¹/₄17¹/₂ leLr jkT;karfjd mi;ksxdrkZ] jkT; ikjs"k.k miØe¹/₄,l-Vh-;w-¹/₂
 rFkk ,l-,y-Mh-lh- fxzM oksYVst dks lnSo vkb-Zb-Zth-lh-] 2010 ds vuq:i
 fuEukuqlkj cuk;s j[kus gsrq lHkh laHko iz;kl djsxsa%

oksYVst& ¹ / ₄ KV rms ¹ / ₂		
ukWfeuy	vf/kdre	U;wure
765	800	728
400	420	380
220	245	198

132	145	122
33	36	30

vuqKflr/kkjh viuh forj.k iz.kkyh dks ikjs"k.k iz.kkfy;ksa ds lkFk tksM+dj :ikafdr $\frac{1}{4}$ fMtkbu $\frac{1}{2}$ vkSj lapkfyr djsaxsA vuqKflr/kkjh miHkksDrk ds iznk; fcUnq ij oksYVst dks fuEukuqlkj ?kksf"kr oksYVst ls de&T;knk u gksus nsxk%

$\frac{1}{4}$ a, $\frac{1}{2}$ fuEu vFkok e;/e oksYVst ds izdj.k esa] 6%ls vf/kd vFkok

$\frac{1}{4}$ ch $\frac{1}{2}$ mPpnkc ds izdj.k esa] gk;j lkbZM ij 6%ls vf/kd vFkok yksoj lkbZM ij 9%ls vf/kd(vFkok

$\frac{1}{4}$ lh $\frac{1}{2}$ vfr mPpnkc ds izdj.k esa] gk;j lkbZM ij 10%ls vf/kd vFkok yksoj lkbZM ij 12.5%ls vf/kd(

mi;qZDr esa dksbZ viokn dsoy miHkksDrk dh fyf[kr vuqefr ls vFkok vk;ksx ds iwoZ vuqeksnu ls gh gksxkA

$\frac{1}{4}$ 18 $\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ ,dk,d yksM fjtsD'ku vkSj oksYVst vucSysal ds dkj.k vLFkbbZ vksoj oksYVst Lrj dks fuEukuqlkj cuk, j[kuk lqfufpr djsxk%

Øekad	ukWfeuy flLVe	Qsl Vq U;qV ^a y oksYVst $\frac{1}{4}$ KV	oksYVst larqyu
1	765	914	1-5
2	400	514	1-5
3	220	283	2
4	132	170	3

33 KVdh iz.kkyh ij oksYVst vlarqyu vFkkZr fdUgha nks Qsl esa oksYVst dk varj iznk; fcUnq ij 3%ls vf/kd ugha tkuk pkfg,A

$\frac{1}{4}$ 19 $\frac{1}{2}$ rhu Qsl ds leLr miHkksDrk vius Hkkj dks bl izdkj larqfyr djsaxs ftlls izR;sd Qsl ds chp yksfaMax dk varj vkSlr yksfMax ds 5%ls vf/kd ugha tkuk pkfg,A

$\frac{1}{4}$ 20 $\frac{1}{2}$ gkeksZfuDl dh vf/kdre vuqefr ;ksX; lhek tSlS fd vkbZ-bZ-bZ-bZ- ekud 519 $\frac{1}{4}$ 1992 $\frac{1}{2}$ esa fofufnZ"V vkSj ftls dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ fxzM ds la;kstdrk ds rdudh ekun.M $\frac{1}{2}$ fofu;e] 2007 $\frac{1}{4}$,rfLeui'pkr~ lh-bZ,-,rdudh ekun.M fofu;e $\frac{1}{2}$ fuEukuqlkj gS%

$\frac{1}{4}$, $\frac{1}{2}$ oksYVst fod`fr lhek&;w-Vh-fyVh dk mRrjnkf;Ro

cl oksYVst	vf/kdre ,dy oksYVst fo:i.k	vf/kdre dqy oksYVst fo:i.k
33 KV& 132KV	3-0	5-0
220KV	2-0	2-5
400KV	1-5	2-0

$\frac{1}{4}$ ch $\frac{1}{2}$ djsaV fod`fr lhek&jkT;karfjd mi;ksxdrkZ dk

fdlh la;kstu fcUnq ij ikjs"k.k iz.kkyh ls fy, tk jgs djsaV gsrq dqy gkeksZfuDl fod`fr 8%ls vf/kd ugha tk,xkA

$\frac{1}{4}21\frac{1}{2}$ 400@220 dsoh rFkk 220@132 dsoh vkbZlhVh dk Vsi
vkWijs'kUl] ,l-,y-Mh-lh- ls vuqeksnu izkIr ds ckn gh fd;k tkuk pkfg,A

$\frac{1}{4}22\frac{1}{2}$ 400 dsoh ij dksbZ Hkh Lofpax vkWijs'ku MCY;w-vkj-,y-Mh-
lh-@,l-,y-Mh-lh- tSlk Hkh izjd.k gks] dh lwpuk o mlds vuqeksnu ds
i'pkr~ gh fd;k tk ldsxk A

$\frac{1}{4}23\frac{1}{2}$ jkT; ikjs"k.k miØe] ikjs"k.k vuqKfIr/kkjH oksYVst fjys ds ek;/e
ls i;kZIr oksYVst fu;a=.k ds mik; miyC/k djK,axs vkSj bls izHkkoh mi;ksx
ls oksYVst /oLr u gks lds] ;g lqfuf'pr djsaxsA

$\frac{1}{4}24\frac{1}{2}$ daMsUlj eksM esa lapkfyr gksus dh {kerk okys gkbM^aks tujsVj
dks ,slk djus dh vko';drk] ,l-,y-Mh-lh- ls izkIr funZs'kksa ds vuqlkj jgsxhA
iai eksM esa lapkfyr gksus dh {kerk okys gkbM^aks tujsVj dks ,slk djus
dh vko';drk] ,l-,y-Mh-lh- ls izkIr funZs'kksa ds vuqlkj jgsxhA

$\frac{1}{4}25\frac{1}{2}$,l-,y-Mh-lh- gj laHko iz;kl djsxk fd miyC/k lksyj] NksVs
gkbM^aks rFkk iou ÅtkZ fxzM esa Mkys tk,a rFkk mUgsa vo'; pyus okys
 $\frac{1}{4}eLV$ ju $\frac{1}{2}$ dsUnz ds rkSj ij O;og`r fd;k tk,A rFkkfi] iz.kkyh ds lapkyd
,sls lksyj] NksVs gkbM^aks vkSj@ iou ÅtkZ tujsVjksa dks tujs'ku cSd Mkmu
ds fy, fIQZ rHkh funsZf'kr dj ldsaxs] tc fxzM lqj{kk@laj{kk vFkok fdlh
midj.k dh lqj{kk vFkok dkfeZd dh lqj{kk [krjs esa gksa vkSj ,sls lksyj]
NksVs gkbM^aks vkSj iou ÅtkZ tujsVj ml dk vuqiky djasxsA bl dk;Z ds fy,
,l-,y-Mh-lh- dks tkudkjH nsus ds fy, MkVk vtZu $\frac{1}{4}$,fDof't'ku $\frac{1}{2}$ iz.kkyh dh
lqfo/kk miyC/k djkbZ tkuh pkfg,A

$\frac{1}{4}26\frac{1}{2}$,l-,y-Mh-lh- fdlh iou $\frac{1}{4}$ foaM $\frac{1}{2}$ tujsVj dks viuk oh-,-vkj-
vkgj.k@fudklh esa dVksrH djus gsrq dg ldsxh ;fn fxzM dh laj{kk
vFkok fdlh midj.k vFkok dkfeZd dh lqj{kk ladV esa gksA

$\frac{1}{4}27\frac{1}{2}$ foaM tujsVj pkyw djus ds nkSjku ;g lqfuf'pr fd;k tk,xk fd
izfrfØ;kRed ÅtkZ vkgj.k $\frac{1}{4}$ M^aky $\frac{1}{2}$ $\frac{1}{4}$ bujl djsaV vkWQ baMDlu tujsVj $\frac{1}{2}$
fxzM ds dk;Z fu"iknu dks izHkkfor ugha djsxkA

5-3 ifjpkYu iz;kstu ds fy, ekax dk vkadyu $\frac{1}{4}$ fMekaM ,LVhes'ku QkWj
vkWijs'kuy ijit $\frac{1}{2}$ %

$\frac{1}{4}$, $\frac{1}{2}$,l-,y-Mh-lh- }kjk pkyw o"kZ ds Hkkj&mRiknu larqyu dh ;kstuk gsrq
ekax] lfØ; ÅtkZ vkSj izfrfdz;k'khy ÅtkZ nksuksa ds
fy, vkdyu nSfud@lIrkfkd@ekfld@okf"kZd vk/kkj ij fd;k tkuk
gSA lapkyu ;kstuk ds mn~ns';ksa ls bl ekax vuqeku dk mi;ksx djrs gq, ,l-,y-
Mh-lh- }kjk iz.kkyh dk v/;;u laiUu fd;k tk,xkA

$\frac{1}{4}ch\frac{1}{2}$,l-,y-Mh-lh- }kjk nSfud@lekIrkfkd@ekfld@okf"kZd vk/kkj ij
vuqeku yxkus ds fy, i)fr;ka@iz.kkfy;ka $\frac{1}{4}$ eSFkksMksykWth@esdsfute $\frac{1}{2}$
fodflr dh tk,xhA bu ekWx&vuqeku rFkk fofHkUu lzksrksa ls vuqekfur
miyC/krk ds vk/kkj ij ,l-,y-Mh-lh- ekax izca/k mik;ksa tSls yksM
'ksafMax] fctyh dVksrH vkfn dh ;kstuk cuk,xh rFkk ;g lqfuf'pr djsxh fd

ikjs"k.k vuqKflr/kkjh }kjk bldk vuqiky fd;k tk,A ikjs"k.k vuqKflr/kkjh] ,l-,y-Mh-lh- ds ekax izca/k mik;ksa ls vkc) jgsxk rFkk ekax vkdyu ds fy, ,sfrgkfld MkVk csl la/kkfjr Hkh djsxkA

$\frac{1}{4}lh\frac{1}{2}$,l-,y-Mh-lh- ,sfrgkfld MkVk rFkk le;≤ ij ekSle ds iwokZuqeku ds vkadM+ksa ds vk/kkj ij ekax vkdyu] rS;kj djsxkA forj.k vuqKflr/kkjh rFkk vU; lacaf/kr O;fDr ekWx vkdyu ds fy, ,l-,y-Mh-lh- }kjk okafNr lqlaxr MkVk rFkk vU; tkudkj miyC/k dj,axsA

$\frac{1}{4}Mh\frac{1}{2}$ lapkyu ds mn~ns'; ls ekax vkdyu dk dk;Z ,l-,y-Mh-lh- }kjk nSfud@lRkfkd@ekfld vk/kkj ij fd;k tkuk gSA ,l-,y-Mh-lh- ij izR;sd 15 feuV ds le; [akM esa nSfud ifjpkYu mi;ksx ds fy, ekax dk vkWu ykbZu vkdyu djus ds fy, mi;qDr i)fr;ka vkSj lqfo/kk, fufeZr dh tkuh pkfg,A

$\frac{1}{4}bZ\frac{1}{2}$,l-,y-Mh-lh- fØ;k'khy vkSj izfrfØ;k'khy ÅtkZ vko';drk dh iwfrZ ds fy, lksyj vkSj foaM ,uthZ ds iwokZuqekuksa dks Hkh /;ku esa j[ksxhA

5-4 ekax izca/ku $\frac{1}{4}fMekaM$ eustesaV $\frac{1}{2}$ %

;g /kkjk ,l-,y-Mh-lh- }kjk cuk, tkus okys izko/kkuksa ls lacaf/kr gS ftuds }kjk vi;kZIr tujsfVax {kerk rFkk ekax iwjk djus ckg~; varj la;kstu $\frac{1}{4}bUVj$ dusD'ku $\frac{1}{2}$ ls V^akalQj vuqiyC/k dh n'kk esa vFkok czsdMkm vFkok jkT;karfjd ;k varjkZT;h; ikjs"k.k iz.kkyh esa dUts'ku vFkok fxzM ds fdLH Hkh Hkkx esa lapkyu leL;k $\frac{1}{4}tSls$ fYDosUlH] lkekU; lapkyu lhek ls vf/kd oksYVst ysoy vFkok FkeZy vksoj yksM vkfn $\frac{1}{2}$ vFkok ,l-bZvkj-lh- ds ;w-vkbZ- fofu;e esa mYysf[kr lhekVksa ls ijs tk dj {ks=h; bufVVhl }kjk ÅtkZ dh vkf/kD; vkgj.k dh n'kk esa fMekaM esa deh djus dks izHkko'khy fd;k tk ldsxk A

$\frac{1}{4}1\frac{1}{2}$ ekaekaekax foPNsnu%&

(i) jkT;karfjd mi;ksxdrkZ dks Hkjld iz;kl djuk pkfg, fd tc dHkh fLVe fYDosalh 49-5 gVZl ds uhps gks rks og viuh lacaf/kr M^aky 'ksM~;qy ds Hkhrj jgrs gq, fxzM ls dqy M^aky dks izfrcf/kr dj ysA tc dHkh fLVe fYDosalh 49-5 gVZl ds uhps gks rks vfrfjDr M^aky dks izfrcf/kr djus ds fy, eSU;qoy yksM 'ksfMax fd;k tk,xkA ,slk yksM 'ksfMax vaMj fYDosalh ds izR;sd Lrj ds fy, iwoZ fu;ksfr gksxkA

(ii) vkxs ;g fd] fuf'pr dafVatsUlH rFkk@vFkok fLVe fLD;qfjVh dks [krjs dh fLFkfr esa ,l-,y-Mh-lh- midsUnzksa dks viuh M^aky fu/kkZfjr ek=k rd de djus gsrq funsZfkr dj ldrk gSA ,sls funsZ'k ij rRdky dk;Zokgh djuk vfuok;Z gSA

(iii) izR;sd jkT;karfjd mi;ksxdrkZ dks ,slh O;oLFkk djuh gksxh] ftlls fd lkekU; rFkk@vFkok dfUVtsUl dafM'ku dh fLFkfr esa ,l-,y-Mh-lh- }kjk ;Fkk vuqnsf'kr nLrh ekax foPNsnu $\frac{1}{4}eSU$;wvy fMekaM fMLdusD'ku $\frac{1}{2}$ fd;k tk ldsA

(iv) tc rd ,l-,y-Mh-lh- }kjk fof'k"V :i ls vuqefr u nh xbZ gks] jkT;karfjd mi;ksxdrkZ dks fxzM ls M^aky de djus ds mik; dks

okil $\frac{1}{4}$ foFkM^akW $\frac{1}{2}$ ugha djuk pkfg,] tc rd fÝDosalh@oksYVst fuEu
Lrj ij cuk jgrk gS A

(v) iz.kkyh dh lqj {kk vkSj fo'oluh;rk dks lqfuf'pr djus ds fy,]
ikjs"k.k esa ladqyu $\frac{1}{4}$ dUts'ku $\frac{1}{2}$ dh n'kk esa leLr jkT;karfjd
mi;ksxdrkZvksa] ikjs"k.k vuqKflr vFkok cM+s miHkksDrk vkSj
vko';d yksM 'ksfMax vFkok mRiknu esa deh $\frac{1}{4}$ cSfdax MkÅu $\frac{1}{2}$
laca/kh ,l-,y-Mh-lh- ds funsZs'kksa dk ikyu djasxsA ladqyu ls
NqVdkjk ikus ds mik;ksa dks fj;y VkbZe esa viukus dh izfØ;k ds
lkFk&lkFk ladqyu dks okil ysus ds izko/kku dsUnzh; fo|qr
fu;ked vk;ksx $\frac{1}{4}$ okLrfod le; izpkyu esa ladqyu ls NqVdkjs ds
mi;ksx $\frac{1}{2}$ fofu;e] 2009 le;≤ ij ;Fkk la'kksf/kr ds vuqlkj jgsaxsA

$\frac{1}{4}2\frac{1}{2}$ - yksM 'ksfMax uhfr%

(i) ekax dh rgyuk esa fo|qr dh miyC/krk de gksus dh n'kk esa] ,l-,y-
Mh-lh- }kjk fofHkUu yksM dSVfjax fQMjksa ij forj.k dEiuh ds
ijke'kZ ls vkfFkZd fl)kar ij yksM 'ksfMax dk lgkjk rc rd fy;k tk,xk tc
rd bl laca/k eas vk;ksx }kjk dksbZ uhfr@vkns'k fofufnZ"V ughas dj
fn;k tkrkA

(ii) fdUgha vkdfLedrk dh n'kkvksa esa vkSj@vFkok iz.kkyh dh
lqj {kk dks [krjk gksus ij ,l-,y-Mh-lh- fdlh jkT;karfjd mi;ksxdrkZ dks
;g funZsf'kr dj ldsxh fd og vius fu;a=.k {ks= eas M^aky dks ,d fuf'pr
ek=k esa de djsa] ,sls funsZ'kksa dk ikyu rqjUr fd;k tk,xkA

(iii) mi;qZDr ds laca/k eas ,l-,y-Mh-lh- fuxjkuh rFkk fu;a=.k dk dk;Z
djsxkA

5-5 fu;r dkfyd izfrosnu $\frac{1}{4}$ fifj;kfMd fjiksVZ $\frac{1}{2}$ %

,l-,y-Mh-lh- }kjk ,lVh;w dks ,d lkIrkgfd fjiksVZ Hksth tkosxh rFkk mlesa
foxr lIrkg esa jkT; fxzM ds fu"iknu dk fooj.k gksxk A lkIrkgfd fjiksVZ esa
fuEu rF; gksaxs %

(i) fÝDosalh izksQkby % izfrfnu ds vf/kdre o U;wure fÝDosalh
fjdkMsZM o izfrfnu ds fÝDosalh osjh;'ku bUMsDl $\frac{1}{4}$,Q-oh-vkbZ- $\frac{1}{2}$

(ii) oksYVst izksQkby % p;fur midUnz ds oksYVst izksQkby

(iii) estj tujs'ku o V^akalfe'ku vkmVst

(iv) V^akalfe'ku dkUIV^aUV% rFkk

(v) fxzM dksM] ds vuqiky u gksus ds yxkrkj@fof'k"V mnkgj.k

5-6 vU; izfrosnu

,l-,y-Mh-lh- =Sekfld fjiksVZ Hkh rS;kj djsxk ftlesa dkUIV^asUV~l] ;fn dksbZ
lqj {kk ekud o lsok xq.koRrk izkIr u fd;k tk ldk gks rks vis {kk izkIr u djus ds
dkj.k fofHkUu jkT;karfjd mi;ksxdrkZ }kjk fy;s x;s fofHkUu dneksa dk
fooj.k] rFkk dkUIV^asUV iSnk djus

ds fy;s ftEesnkj jkT;karfjd mi;ksxdrkZ ds uke lekfg gksaxsA ,l-,y-Mh-lh-
{kjk jkT; ikjs"k.k miØe] lh-,l-ih-Mh-lh-,y- vkSj vU; ikjs"k.k

vuqKflr/kkfj;ksa dk =Sekfld ,uthZ cSysal rS;kj fd;k tk,xk rFkk mls lacaf/kr dks rFkk vk;ksx dks izLrqr fd;k tk,xkA

5-7 ifjpkYu lgdkj $\frac{1}{4}$ vkWijs'kuy yk;lu $\frac{1}{2}$

;g Hkkx lezx fxzM iz.kkyh ij lapkyu rFkk@vFkok ?kVuk ds laca/k esa fuEu laca/kh lwpuk fofue; ds fy;s vko';drk fu/kkZfjr djrh gS %

- (i) jkT; fxzM %
- (ii) varj jkT; fyad % rFkk
- (iii) bUV^akLVsV bufVVh dh iz.kkyh

lkekU;r% mijksDr vf/klwfpr djrs gSa fd D;k gksus dh laHkkouk gS vFkok D;k gks pqdk gSA vkWijs'kuy yk;lu QaD'ku ,l-,y-Mh-lh- rFkk vU; jkT;karfjd mi;ksxdrkZvksa dk eSUMsVjh feYV bu gk;jvkphZdy QD'ku $\frac{1}{4}$ mandatory built in hierarchical function $\frac{1}{2}$ gS tks vkWijs'kuy LVkWQ dks Rofjr lwpuk nsus gsrq gSA ;g vko';d buiqV dks ijLij lac) djsxk] tks fu.kZ; ysus ,oa dk;Z djus dks vuqdwY djsxkA

ifjpkYu lgdkj gsrq izfØ;k%

$\frac{1}{4}$ 1 $\frac{1}{2}$ LVsV fxzM esa lapkyu rFkk ?kVuk,a

LVsV fxzM esa fdlh lapkyu ds iwoZ] ,l-,y-Mh-lh- ml izR;sd bUVkbVh dks lwfpr djsxk] rFkk gksus okys lapkyu dk fooj.k nsxk] ftldk fLVe bl ifjpkYu izHkko dk vuqHko dj ldrk gS vFkok djsxkA jkT; fxzM esa ?kVuk ds rRdky ckn] ,l-,y-Mh-lh- bosUV ds rRdky ckn] ?kVuk esa D;k gqvk] mldk fooj.k ml izR;sd jkT;karfjd mi;ksxdrkZ dks lwfpr djsxk ftldh iz.kkyh bl izpkYu izHkko dk vuqHko dj ldrh gS ;k djsxhA

$\frac{1}{4}$ 2 $\frac{1}{2}$ jkT;karfjd mi;ksxdrkZ ds

fdlh ,sls lapkyu dks ftlls jkT; fxzM vkWijs'kuy izHkko dk vuqHko dj ldrk gS vFkok djsxk] viuh iz.kkyh ij djus ds igys] jkT;karfjd mi;ksxdrkZ ,l-,y-Mh-lh- dks lwfpr djsxk] rFkk bles fd;s tkus okys lapkyu dk C;kSjk nsxkA jkT;karfjd mi;ksxdrkZ dh iz.kkyh ij ?kVuk ds rqjUr i'pkr~ jkT;karfjd mi;ksxdrkZ ;fn jkT; fxzM vkWijs'kuy effect ls izHkkfor gks ldrk gS@gksxk] rks ?kVuk esa D;k gqvk dk fooj.k Hkh ,l-,y-Mh-lh- dks crk,xkA

400@220 dsoh ;k 220@132 dsoh ds fV^ai $\frac{1}{4}$ can $\frac{1}{2}$ gq, vkbZ-lh-Vh- ds fjtkftZax gsrq vfuok;Zr% ,l-,y-Mh-lh- }kjk jkT; iksj"K.k miØe ds inkafdr izkf/kdj.k ls vuqefr izkIr djuk pkfg;s A

5-8 ;kstuk $\frac{1}{4}$ vkmVst Iyxfuax $\frac{1}{2}$

5-8-1 lkekU;%

- 1- jkT; iz.kkyh vkWijsfVax dafM'ku rFkk tujs'ku o fMekaM csysal dks /;ku esa j[krs gq;s dks lefUor $\frac{1}{4}$ vkWfMZusVsM $\frac{1}{2}$ rFkk vuqdwY rjhds $\frac{1}{4}$ vkWfIVey esuj $\frac{1}{2}$ esa jkT; fxzM ds rRo $\frac{1}{4}$,yhesaV $\frac{1}{2}$ ds fy;s fudklh lwph $\frac{1}{4}$ vkMvSt 'ksM~;wy $\frac{1}{2}$ rS;kj djus gsrq bl Hkkx esa
izfØ;k fu/kkZfjr dh xbZ gSA bu fofuZns'kks ds varxZr lfEefyr fxzM ds ,yhesaV dh lwph rS;kj dh tkuh pkfg;s rFkk ,l-,y-Mh-lh- ds ikl miyC/k gksuh pkfg;sA
- 2- bl /kkjk ds mn~ns'; fuEukuqlkj gS %
(i) lHkh miyC/k lalk/kuks dks /;ku esa j[krs gq;s rFkk V^akalfe'ku dkaLVs^aUV rFkk fo|qr ds ekSleh vko';drk dks /;ku esa j[krs gq;s jkT; fxzM ds fy;s dks lefUor $\frac{1}{4}$ vkWfMZusfVax $\frac{1}{2}$ tujs'ku vkMvSt dk;ZØe rS;kj djukA
(ii) iz.kkyh esa ikWoj rFkk ,uthZ dh vko';drk ds vk/kkj ij vkf/kD; $\frac{1}{4}$ ljlyl $\frac{1}{2}$ ljlyl vFkok deh $\frac{1}{4}$ MsfQflV $\frac{1}{2}$;fn dksbZ gks] dks U;wure djuk rFkk lqj{kk ekud ds vanj iz.kkyh lapkyu esa lgk;rk djukA
(iii) mRiknu vkMvSt 'ksM~;wy] iz.kkyh ds va'k esas vkMvSt rFkk iz.kkyh ds lqj{kk ekudksa dk fuokZg djrs gq,A fxzM vkWijs'ku ij fcuk izfrdwy izHkko Mkys jkT; fxzM ds ,yhesaV ds V^akalfe'ku vkMvSt dks vuqdwY cukukA
- 3- vkMvSt dh fLFkfr esa lqj{kk ekud izkIr djus gsrq tujs'ku vkMViqV rFkk V^akalfe'ku fLVe leqfpr gksuk pkfg;sA
- 4- pkyw o"kZ ds fy;s vfxze Iykfuax rS;kj dh tkuh pkfg;s rFkk o"kZ esa =Sekfld o ekfld vk/kkj ij mldh leh{kk dh tkuh pkfg;sA
;kstuk dsdsdsds nkf;Ro%
- 1- leLr jkT; buVkbVh }kjk iznRr vkMvSt 'ksM~;wy ds fo'ys"k.k vkxkeh o"kZ ds fy, M^akIV vkMvSt 'ksM~;wy rFkk pkyw o"kZ gsrq vafre ;kstuk tqykbZ ekg rd cukus dk nkf;Ro ,l-,y-Mh-lh- dk gS A
- 2- ,l-Vh;-w- }kjk vkMvSt Iyku dh leh{kk dh tkosxh A
- 3- nh?kZdkfyd ;kstuk esa i;kZIr fLVe IykaV ekftZu o jsfVax lqfuf'pr djus rFkk y?kqdkfyd ;kstuk esa fYDosalh daV^aksy esa enn djus gsrq nksuks izdj.kksa esa lgh fMekaM ,LVhes'ku vko';d gSA o"kZ iwoZ] ekg iwoZ vk/kkj ij visf{kr vof/k ds fy;s forj.k daiuh vius fMekaM ds ,LVhesV ,lVh;w dks miyC/k djkosxk A bl vk/kkj ij ,l-Vh;-w- ekfld ihd rFkk de ekax $\frac{1}{4}$ yhu $\frac{1}{2}$ vof/k esa mRrjo"khZ; fMekaM ,LVhesV djsxkA ?kaVs vk/kkj ij ,l-Vh;-w- tujs'ku les'ku vkadMs+ rFkk vk;kr@fu;kZr vkadM+s fMekaM ,LVhes'ku cukus gsrq mi;ksx djsxkA forj.k daiuh ,l-,y-Mh-lh- dks ml yksM dk ,LVhesV miyC/k dj;sxh] ftls vko';drk ds vk/kkj ij de $\frac{1}{4}$ 'ksM $\frac{1}{2}$ fd;k tk ldrk gSA bls og vyx&vyx le;kof/k gsrq yksM 'ksfMax dh O;oLFkk ds fooj.k ds lkFk nsxkA ,l-Vh;-w- rFkk izR;sd vo;o $\frac{1}{4}$ dkaLVhV~;w,aV $\frac{1}{2}$ ds e/; lger izfØ;k ds vuqlkj lHkh MkVk ,df=r fd;s

tkosaxs A ,l-,y-Mh-lh- izR;sd ?kaVs dk jkT; fMekaM dk MkVk csl
j[ksxkA

dh izfØ;k ¼vkmVst Iyxfuax izksls

1- ,l-Vh-;w- rFkk tujsfVax IykaV] ,l-,y-Mh-lh- dks vius izLrkfor vkmVst
dk;ZØe orZeku o"kZ ds vxLr ekg ds var rd vxys o"kZ ds fy;s fyf[kr esa
izLrqr djsxsa A ;s tkudkj izR;sd tujs'ku ;wfuV@ykbu@ vkbZ-lh-Vh- ds
fy, izR;sd vkmVst dh izLrkfor frFk rFkk tgkW blesa ifjorZu
¼¶ysDlhfcfyVh½ laHko gks ogkW tYnh ls izkjaHk gksus okyh rFkk nsj ls
lekIr gksus okyh frFk ds lfgr gkasxsa

2- ,l-,y-Mh-lh- vuqdwy rjhds ¼vkIVhdy esuj½ rFkk lqj {kk ekud dk
fuoZgu djus esa miyC/k lalk/ku dks ;ku esa j[krs gq;s LVsV fxzM ds fy;s
pkyw o"kZ ds flracj ekg
ds var rd vxys o"kZ ds fy;s vkmVst dk;ZØe rS;kj djsxkA ;g iz.kkyh ds
vko';d v/;u djus ds ckn ;g rS;kj fd;k tkosxk] rFkk ;fn vko';drk iM+s
rks vkmVst dk;ZØe dks iqu%fufeZr fd;k tk,xkA tc vkmVst dk;ZØe
dks vafre :i fn;k tk jgk gks rks tujs'ku rFkk yksM ds chp mi;qDr larqyu
lqfufpr fd;k tkuk pkfg,A

3- ikjs"k.k fudklh ;kstuk dks tujsVj fudklh ;kstuk ds lkFk lefUor
¼gkeksZukbZt+½ fd;k tk,xk rFkk forj.k iz.kkyh dh fudklh ;kstuk dks
mRiknu rFkk ikjs"k.k fudklh ;kstuk ds lkFk lefUor ¼gkeksZukbZt½+
fd;k tk,xkA

4- vxys o"kZ gsrq bl ;kstuk dks leLr jkT;karfjd mi;ksxdrkZvksa dks
vf/kdre tuojh ekg ds var rd vFkok ,sls fdlh iwoZorhZ fnukad dks tks
jkT; iksj"k.k miØe }kjk fufpr dh tk,] fØ;kUo;u gsrq lwfpr fd;k tk,xkA

5- vxys o"kZ dh bl ;kstuk dks ,l-,y-Mh-lh- @jkT; ikjs"k.k miØe }kjk
=Sekfld vkSj ekfld vk/kkj ij loZlacaf/kr i{kdkjksa ds leUo; ls iqujhf{kr
fd;k tk,xkA

6- iz.kkyh esa vkikrdky tSls tujs'ku esa deh] iz.kkyh dks izHkkfor djus
okyk V^akalfe'ku ykbZu czsdMkmu] fxzM esa O;o/kku ¼fMLVjcsU½
iz.kkyh dk vkblksys'ku] vof/k dh n'kk esa ,l-,y-Mh-lh- fudklh vk;kstuk dks
Lohd`fr nsus ds igys iqu% v/;u djklr gSA

7- fuEu esa ls fdlh Hkh voLFkk ds gksrs ,l-,y-Mh-lh- fudklh vk;kstuk dks
LFkfxr djus vf/kd`r gS %

- i. iz.kkyh esa dksbZ cM+k O;o/kku (
- ii. iz.kkyh dk vyx gks tkuk (
- iii. iz.kkyh ds fdLH Hkkx esa Cysd vkÅV (rFkk
- iv. iz.kkyh esa vU; dksbZ ?kVuk tks izLrkfor fudklh ds dkj.k
iz.kkyh dh] lqj {kk ij izfrdwy izHkko Mkyrk gSA

- 8- $\frac{1}{4}$ fudklh $\frac{1}{2}$ vkmVst izkIr djus ds iwoZ izR;sd jkT; buVkbVh dks ,l-,y-Mh-lh- ls vafre vuqeksnu vfuok;Zr^o izkIr djuk pkfg;sA
- 5-9 cgkyh $\frac{1}{4}$ fjdojh $\frac{1}{2}$ izfzfzfzfzØ;k
- 1- leLr jkT; bUVkbVh ds ijk'e'kZ ls ,l-,y-Mh-lh- }kjk vkaf'kd@lexz Cysd vkmV dh fLFkfr esa fxzM ds cgkyh gsrq O;kid ;kstuk rFkk izfØ;k fodflr dh tkosxh rFkk gj o"kZ mldh leh{kk@v|ru dh tkosxhA
- 2- ,l-,y-Mh-lh- ds leUo; ls lacaf/kr bUVkbVh }kjk jkT; ds Hkhrj vius iz.kkyh ds vkaf'kd@lexz OySd vkmV ds ckn cgkyh ds fy, O;kid ;kstuk rFkk izfØ;k vafre :i fn;k tkosxkA
- 3- CySd LVkVZ lqfo/kk okys mRiknu dsUnzksa] varjkZT;h; flaØksukbftax IokbZaV rFkk izkFkfedr ds vk/kkj ij vR;ko';d fd;s tkus okys yksM cgkyh dh lwph ,l-,y-Mh-lh- rS;kj djsxk rFkk miyC/k j[ksxkA
- 4- CySd vkmV ds ckn fxzM ds 'kh?kzre laHkkfor cgkyh izkIr djus vko';d dne ds :i esa] ,l-,y-Mh-lh- cgkyh izfØ;k ds nkSjku lqj{kk ekud ls de oksYVst ,oa fÝDosalh ij fxzM lapkyu djus vf/kd`r gSA
- 5- cgkyh $\frac{1}{4}$ fjdojh $\frac{1}{2}$ dh izfØ;k dh izR;sd ijorhZ o"kZ esa leh{kk} iqf"Vdj.k vkSj@vFkok iqujh{k.k dh tk,xhA jkT; Hkkj izs"k.k dsUnz }kjk jkT;karfjd mi;ksxdrkZvksa vkSj ikjs"k.k vuqKflr/kkfj;ksa ds leUo; vkSj ijk'e'kZ ls fofHkUu miiz.kkfy;ksa dh izfØ;k ds fy, dk;Z'kkyk vkSj i)fr dk fleqys'ku vH;kl lfgr izf'k{k.k dk;ZØe vk;ksftr fd, tk ldsaxsA
- 6- cgkyh izfØ;k ds fy, okafNr leLr lapkj pSuyksa dk mi;ksx] fxzM ds lkekU; n'kk esa vkus rd ek= lapkyu lapkj gsrq fd;k tk,xkA
- 5- $\frac{1}{2}$ dh lwpuk&
- 1010 :g Hkkx leLr ikT:karfid mi;ksxdrkZ rFkk ,l-,y-Mh-lh- ds iz.kkvh esa lwfpr ?kVuk ds fjiksZfVax izfØ;k ls laca/k j[krk gSA bl /kkjk dk mn~ns'; ml ?kVuk dks] ftldh fjiksVZ dh tkuh gS] viuk;k tkus okyk fjiksZfVZax ekxZ rFkk vkiwfrZ dh tkus okyh lwpuk dks ifjHkkf'kr djuk gS rkfd ?kVuk dh lqlaxr fjiksZfVZax lqfufpr gks ldsA
- 5-10101010-1 nkf;Ro&
- jkT;karfjd mi;ksxdrkZ }kjk ,l-,y-Mh-lh- dks fjiksVZ djus ;ksX; ?kVukvksa ds vykok fjys bafMds'ku lfgr fdllh mRiknu bdkbZ dh fV^afiar vFkok jkT;karfjd ikjs"k.k iz.kkyh ds V^akalf'e'ku vo;o $\frac{1}{4}$,fyesaV $\frac{1}{2}$ dh fV^afiar ds ckjs esa fjiksZfVax djuk gksxkA ,l-,y-Mh-lh- bu ?kVukvksa dks jkT; ikjs"k.k miØe dks fjiksVZ djus gsrq nkf;Rok/khu jgsxhA ekuhVfjax rFkk ?kVuk esa fo'kys"k.k ds fy, ,l-,y-Mh-lh- dks leLr vko';d MkVk ds dysD'ku rFkk fjiksZfVZax ds fy, lHkh jkT;karfjd mi;ksxdrkZ mRrjnk;h gksaxsA
- 5-10101010-2 izfrosnuh; ?kVuk,a
- 200 esxkokV ls vf/kd dh dksbZ Hkh ?kVuk tks tsusfVax ;wfuV dh {kerk ;k yksM dks izHkkfor djrk gks] mls ,l,yMhlh }kjk laf{kIr esa ,l-Vh-;w- dks crkuk vko';d gSA

- (i) lqj{kk ekudks dk mYya?ku-
- (ii) lapkyuh; voKk-
- (iii) vuqns'kksa dh voekuuk@vuqiky u gksuk-
- (iv) flLVe vkbysafMax@flLVe CySd vkmV-
- (v) jkT; CySd vkmV@vkaf'kd iz.kkyyh CySd vkmV-
- (vi) o`gr lqj{kk vlQyrk-
- (vii) flLVe buLVsfofyVh $\frac{1}{4}$ iz.kkyyh esa vlLFkjrk $\frac{1}{2}$
- (viii)jkT; fxzM ds fdlh Hkh bZ-,p-Ogh- vo;o $\frac{1}{4}$,yhesaV $\frac{1}{2}$ dh fV^afiar-
- (ix) cMs+ midj.k dh [kjkch $\frac{1}{4}$ failure $\frac{1}{2}$ -

5-10101010-3 fjiksZfVax izfØ;k%

- (i) dks jkT;karfjd ,aVkbZVht+ }kjk%

,sls izdj.k esa tggj fdlh ?kVuk dh izkjafHkd fjiksVZ fdlh jkT;karfjd mi;ksxdrkZ }kjk ,l-,y-Mh-lh- dks ekSf[kd :i ls dh tkrh gS ogkj ,slk mi;ksxdrkZ ?kVuk dh fjiksVZ ,l-,y-Mh-lh- dks fyf[kr :i esa bl /kkjk ds izko/kkuksa ds vuqlkj izLrqr djsxkA

- (ii) }kjk ?kVuk dh fyf[kr fjiksVZ jkT;karfjd mi;ksxdrkZvksa dks %

tgka fdlh ?kVuk dh izkjafHkd fjiksVZ ,l-,y-Mh-lh- }kjk fdlh mi;ksxdrkZ dks iwoZ esa

ekSf[kd :i ls nh xbZ gS ogka ,l-,y-Mh-lh- }kjk mi;ksxdrkZ dks fyf[kr lkIrkgd fjiksVZ

bl /kkjk ds izko/kkuksa ds vuqlkj izLrqr dh tk,xhA

5-10101010-4 fyf[kr izfrosnu dk izk:i&

;Fkk izdj.k fyf[kr fjiksVZ ,l-,y-Mh-lh- vFkok mi;ksxdrkZ }kjk vfuok;Zr% nh tkosxh rFkk

?kVuk ds fuEufyf[kr C;kSjsa lfgr ekSf[kd lwpuk dh iqf"V Hkh djuh gksxh %

- (i) ?kVuk dk le; o frfFk-
- (ii) LFky $\frac{1}{4}$ yksds'ku $\frac{1}{2}$ -
- (iii) lh/ks 'kkfey la;a= rFkk@vFkok midj.k-
- (iv) ?kVuk dk dkj.k rFkk fooj.k-
- (v) ekax rFkk@vFkok tujs'ku $\frac{1}{4}$ esxkokV $\frac{1}{2}$ ckf/kr ,oa vof/k-
- (vi) leLr izklafxd iz.kkyyh MkVk] O;ko/kku fjdkMZj $\frac{1}{4}$ disturbance recorder $\frac{1}{2}$] bosUV ykxj]

Mh-,-l- vkfn lfgr leLr fjdkfMZx bULV^awesaV~l $\frac{1}{4}$ recording instruments $\frac{1}{2}$ ds fjdkMZ

dh izfr;ka lfgr -

- (vii) le; lfgr fV^afiar dk Øe-

- (viii)fjys ¶ySx dk C;kSjk-

(ix) mipkjd mik; ¼remedial measures½-

&&000&&

v/;k;&6

vuqlwphdj.k o

izsizensizs"k.k

6-1 bl /kkjk dk laca/k ,d fnu iwoZ vk/kkj ij jkT;karfjd fgrxzkfg;ksa }kjk usV
butsD'ku@vkgj.k¼M^aky½ ds vuqlwphdj.k rFkk ,l-th-,l-@ bu-,l-th-,l-@ ,l-,y-
Mh- lh-@fgrxzkfg;ksa @ cMs miHkksDrkvksa rFkk vU; jkT;karfjd
mi;ksxdrkZvksa ds chp tkudkjh ds izokg ls lacaf/kr viukbZ tkus okyh i)fr ls
gSA ;g i)fr izR;sd ,l-th-,l-@bu-,l- th-,l- }kjk {kerk dh ?kks"k.kk ¼butsD'ku
'ksM~;wy½ dh izLrqfr vkSj izR;sd fgrxzkgh@Fkksd miHkksDrk rFkk vU;
jkT;karfjd mi;ksxdrkZvksa dh vko';drk@ vkgj.k¼M^aky½ 'ksM~;wy dh izLrqfr
dks fofufnZ"V djrh gS rkfd ,l-,y-Mh-lh- ,l-th-,l-@,u-,l-th-,l- ds fy, izs"k.k
'ksM~;wy rFkk izR;sd jkT;karfjd mi;ksxdrkZ ds fy, vkgj.k¼M^aky½
'ksM~;wy cuk ldsA ;g /kkjk 'ksM~;wy ls fopyu gsrq okf.kfT;d O;oLFkk lfgr
okLrfod le; izs"k.k@ vkgj.k¼M^aky½ vuqns'k rFkk tkgW Hkh vko';d gks iqu%
'ksM~;wfyax vkSj izfrfØ;kRed ÅtkZ izokg ds fy, viukbZ tkus okyh i)fr ls Hkh
lacaf/kr gSA ;s ekxZ funsZ'k ,l,yMhlh jkT; ikjs"k.k miØe vkSj ikjs"k.k
vuqKflr/kkjh dks iz;ksT; rFkk nh?kZ vof/k ,oa e/e vof/k okys jkT;karfjd [kqyh
[kqyh ¼mueqDr½ igqap ¼vksiu ,Dlsl½ ds fuEufyf[kr mi;ksxdrkZvksa dks Hkh
iz;ksT; gksaxs%

¼,½ jkT; mRiknu dsUnz

¼ch½ jkT;karfjd mRiknu dsUnz ¼iquuZohuhdj.k vk/kkfjr mRiknu
la;a=ksa dks NksM+dj½

¼lh½ jkT; esa fLFkr dsUnz {ks=h; mRiknu la;a=} tSlk fd Hkkjrh; fo|qr fxzM
dksM fofu;e] 2010 ds vuqPNsn 6-4 esa fofufnZ"V gS]

¼Mh½ fgrxzkfg;ksa]

¼bZ½ Fkksd miHkksDrkvksa

bl lafgrk esa fofufnZ"V vuqlwphdj.k o izs"k.k dh izfØ;k,a y?kq vof/k ds fdlh
jkT;karfjd mi;ksxdrkZ vFkok y?kq vof/k ds fdlh varjkZfT;d [kqyh
¼mueqDr½ igqap ¼vksiu ,Dlsl½ mi;ksxdrkZ dks ykxw ugha gksaxhA fdUrq
nh?kZ rFkk e/e vof/k ds [kqyh ¼mueqDr½ igqap ¼vksiu ,Dlsl½
miHkksDrkvksa ij ykxw fd;k tk,xkA nh?kZ] e/e rFkk y?kq vof/k ds
varjkZT;h; [kqyh ¼mueqDr½ igqap ¼vksiu ,Dlsl½ dk fofu;eu vkbZ-bZ-th-
lh- vkSj lh-bZ-vkj-lh- ds varjkZT;h; [kqyh ¼mueqDr½ igqap ¼vksiu ,Dlsl½
fofu;e] le;≤ ij ;Fkk la'kksf/kr ds vuqlkj gksxkA dsUnzh; {ks= ds mRiknu
dsUnz ls ikWoj dh vkgj.k¼M^aky½ rFkk varj jkT;h; ikWoj varj.k ds fy, ,l-,y-
Mh-lh- }kjk vkbZ-bZ-th-lh- dk vuqlj.k fd;k tk,xk rFkk MCyw-vkj-,y-Mh-lh-
ls leUo; j[kk tk,xkA

6-2 vuqlwphdj.k vkSj

6-2-1 ,l-,y-Mh-lh- lezx :i ls fuEufyf[kr ds izfr mRrjnk;h jgsxh%

- (i) jkT; mRiknu dsUnzksa dk vuqlwphdj.k o izzs" k.k(
- (ii) vkbZ-,l-th-,l- ls vkgj.k^{1/4}M^aky^{1/2}dk vuqlwphdj.k ^{1/4}lacf/kr la;a=ksa dh laHkkfor {kerk esa muds Hkkx ds Hkhrj jgrs gq,^{1/2}(
- (iii) jkT; ds fgrxzkfg;ksa dh ekax dk fofu;eu(
- (iv) f}i{kh;@lkeqfgd varj ifjorZuksa dk fofu;eu] ;fn dksbZ gks(
- (v) lh-bZvkj-lh- ds lacaf/kr fofu;eu ds vuqlkj {ks=h; fxzM ls vius fu;a=.k {ks= esa 'kq) ^{1/4}usV^{1/2} vkgj.k^{1/4}M^aky^{1/2} dk fofu;eu(
- (vi) jkT; fxzM ls la;ksfr [kqyh ^{1/4}mueqDr^{1/2} igqap ^{1/4}vkisiu ,Dlsl^{1/2} okys miHkksDrk ds varjHkj.k ^{1/4}butsD'ku^{1/2}@ vkgj.k^{1/4}M^aky^{1/2} dk fofu;eu(
- (vii) jkT;karfjd ,l-th-,l- dk fofu;eu(
- (viii) jkT; ;wvkbZ [kkrs dk la/kkj.k@mi;ksxdrkZvksa@jkT;karfjd mi;ksxdrkZ ds ;wvkbZ Hkqxrku dk ladyu rFkk laforj.k(
- (ix) jkT; fo|qr ys[kksa ^{1/4}LVsV buthZ ,dkamV^{1/2} dk la/kkj.kA

6-2-2 fgrxzkgh] ,l-,y-Mh-lh- ds ek;/e ls dsUnzh; mRiknu dsUnzksa rFkk vU; mRiknu la;a=ksa ls viuh 'kq) vkgj.k^{1/4}M^aky^{1/2} dks ges'kk Lo;a ds fy, fu/kkZfjr vkgj.k^{1/4}M^aky^{1/2} lkj.kh dh lhek esa lnSo cuk, j[kus dk iz;kl djsaxsA

6-2-3 fgrxzkfg;ksa@Fkksd miHkksDrkvksa ls izkIr nSfud vkgj.k^{1/4}M^aky^{1/2} vuqlwph ds vk/kkj ij ,l-,y-Mh-lh- }kjk fn, x, lykg vuqlkj ikWoj mRiknu ds fy, lkekU;r% jkT; o jkT;karxZr tujsfVax la;a= ftEesnkj gkasxs A rFkkfi] la;a= vkSj iz.kkyh dh n'kk ij fuHkZj jgrs gq, os izn~Rr 'ksM~;wy ls fopfyR Hkh gks ldrs gSaA fo'ks" k dj U;wurk dh n'kk esa izn~Rr 'ksM~;wy ls vf/kd mRiknu gsrq mUgsa vuqefr@izksRlkgu iznku fd;k tk,xkA ,Dlcl tujs'ku 'ksM~;wy ls fopyu ds fy, vk;ksx }kjk le;~d dher yxkbZ tk,xhA ijUrq ;g fd tc fQzDosalh 50-2 g~VZt ls vf/kd gks] okLrfod dqy bUtsD'ku ml vof/k gsrq 'ksM~;wy izzs" k.k ls vf/kd u gks A tc fQzDosalh 50-2 g~VZt ls vf/kd gks rks tujsfVax la;a= ^{1/4}vius foosd ls^{1/2} fQzDosUlh o`f) dks lhfer djus ,l-,y-Mh-lh- ds lykg dh izrh {kk fd;s fcuk cSdMkmu dj ldrh gS A tc fQzXosUlh 49-7 g~VZt ls uhps fxjrk gS rks lHkh dsUnzks esa <sup>1/4</sup>flok; fifdx M~;wVh okys<sup>1/2</sup> tujs'ku esa fcuk ,l-,y-Mh-lh- ds lykg ds de ls de ml Lrj rd o`f) fd;k tkuk pkfg;s tgg; fxzM dks fLFkj cuk;s j[kk tk ldrk gSA mijksDr ds gksrs gq;s Hkh ,l,yMhlh] vkdfLedrkh dh n'kk tSlS ykbZUl@V^akalQkeZj dk vksOgjyksM] vlkekU; oksYVst] iz.kkyh lqj {kk dks [krjk gksus dh fLFkfr esa vius tujs'ku@M^aky dks c<+kus@?kVkus gsrq tujsfVax la;a=@fgrxzkfg;ksa dks funsZ'k ns ldrk gSA bu funsZ'kksa ij vfuok;Zr% vfoyac dk;Zokgh djuh gksxhA

6-2-4 lacaf/kr forj.k vuqKflr/kkj] jkT;karfjd mi;ksxdrkZ rFkk ,l-,y-Mh-lh- ;g lqfuf'pr djasxs fd mudh Lor% ekWx izca/ku ;kstuk ^{1/4}vkVksesfVd fMekaM eSustesaV Ldhe^{1/2} bl izdkj ls dke djs ftlls ;g lqfuf'pr gks fd tc fYDosalh 49-5

g~VZt ;k mlls uhps gks rks fdlh izdkj dh vfrfjDr vkgj.k^{1/4}M^aky^{1/2} u gksA ;fn mudh Lor⁰ ekax izca/ku ;kstuk vHkh rd izkjaHk ugha gqbZ gS rks oSlh n'kk esa tc fÝDosalh 49-5 g~VZt ;k mlls uhps gks rks eSU;woy ekWx izca/ku ;kstuk ds vuqlkj 'kqU; vksoj M^aky lqfuf'pr dh tk,xhA

6-2-5 tujs'ku o V^akalfe'ku iz.kkyyh ds vkmVst dh lHkh fLFkfr esa] tks jkT; fxzM ij izHkko Mkyrs gksa] lHkh buVkbZVh vyx ls vafre :i nh xbZ izfØ;k ds vuqlkj vfuok;Zr⁰ ,d&nwljs ds lkFk lg;ksx o leUo; djsaxsA vf/kdre vuqdwyrk izkIr djus gsrq fo'ks"kdj tujs'ku dks lhfer djus gsrq] vkmVst djus dh vko';drk laca/kh ;kstuk ftldk okf.kfT;d izHkko fgrxzkg;ksa dks izkIr gks ldrk gS lko/kkuh iwoZd rS;kj djuk pkfg;sA

6-2-6 fcfyax ds mn~ns'; ls [kqyh ^{1/4}mueqDr^{1/2} igqap ^{1/4}vkxiu ,Dlsl^{1/2} ds miHkksDrk@jkT;karfjd mi;ksxdrkZ leLr okafNr tkudkj ,l-,y-Mh-lh- dks miyC/k dj,axsA

6-2-7 lHkh jkT;karfjd mi;ksxdrkZ fÝDosalh lefUor ^{1/4}fyUDM^{1/2} yksM izs"k.k dh vo/kkj.kk rFkk 'ksM~;wy ls fopyu vFkkZr~ vlwfpr varj ifjorZu ^{1/4}vu'ksM~;wy baVjpsat^{1/2} ij vk/kkfjr dher ^{1/4}jkT; ds ,chVh ,aM ;wvkbZ fofu;eu^{1/2} ls vfuok;Zr⁰ ca/ks gksaxsA vk;ksx ds fdlh vkns'k vFkok fofu;eu ls NwV izkIr la;a=ksa ds flok; lkekU;r⁰ jkT;karxZr vU; mi;ksxdrkZ ;FkklaHko ,l-,y-Mh-lh- }kjk tkjh fu/kkZfjr fÝDosalh lefUor ^{1/4}fyUDM^{1/2} yksM izs"k.k ekxZn'kZu ds vuqlkj lapkfyr gksaxs] tc rd fd ,l-,y-Mh-lh- }kjk vU;Fkk lykg u nh xbZ gksA

6-2-8 ,sls nh?kZ vof/k vFkok e/e vof/k esa jkT;karxZr vkxiu ,Dlsl miHkksDrkvksa tks ,d esxkokWV ls vf/kd lhek rd ikWoj dk vk;kr ^{1/4}bEiksVZ^{1/2} vkSj@vFkok fu;kZr ^{1/4},DliksVZ^{1/2} djrs gSa dk vuqlwphdj.k rFkk izs"k.k ,l-,y-Mh-lh- ds varxZr jgsxk] flok; vk;ksx }kjk fdlh vkns'k vFkok fofu;e ls NwV izkIr la;a=ksa ds ekeys esaA
 ,l-,y-Mh-lh-@,l-Vh-;w-@forj.k vuqKflr/kkj fu;fer :i ls vius jkT;ksa@{ks=ksa ds fy, y?kq vof/k dh ekWx dk vuqeku yxk,axs ftlls os i;kZIr le; igys bl ckr dh ;kstuk cuk ldsA dh miHkksDrkvksa ds Hkkj dh iwfrZ fcuk fxzM ls vfrfjDr fudklh ds dSl ls laHko gks ldsA

6-3 vkSj izs"k.k izfØ;k⁰

1- jkT; mRiknu dsUnz] jkT; ds jkT;karfjd foØsrk izfrfnu izkr⁰ 9 cts Mh-lh- dks vxys fnu ds fy, vFkkZr 0000 cts ls 2400 cts dsUnzokj ,Dl ikWoj IykaV esxkokWV rFkk esxkokWV voj dh iwoZn`"V ^{1/4}Qksjlhu^{1/2} {kerkvksa dh tkudkj nsaxsA

2- jkT; mRiknu dsUnzksa o jkT;karxZr mRiknu dsUnzks ls iwoZn`"V mRiknu {kerk rFkk if'pe {ks= Hkkj izs"k.k dsUnz ls dsUnzh; mRiknu dsUnzksa dh fgrxzkg;ksa vkSj Fkksd miHkksDrkvksa gsrq vxys fnol ds fofHkUu ?kaVksa esa esxkokV rFkk esxkokV ?kaVs dh ik=rkvksa ls lacaf/kr leLr tkudkj ,l-,y-Mh-lh- }kjk izfrfnu ,d= dh tk,xh vkSj

iwokZUg 11 cts rd fgrxzkfg;ksa@Fkksd miHkksDrkvksa dks lwpuk tkjh dj
nh tk,xhA

3- izfrfnu vijkUg 2 cts rd jkT; mRiknu dsUnz jkT;karxZr mRiknu dsUnz]
fgrxzkgh rFkk Fkksd miHkksDrk mi;qZDr miyC/k djkbZ xbZ lkj.kh esa
;fn dksbZ ifjorZu okafNr gksa rks mldh lykg ,l-,y-Mh-lh- dks nsaxsA

6-4 izfrfnu jkf= 08 cts rd ,l-,y-Mh-lh- lalwfp djsxk%

$\frac{1}{4}, \frac{1}{2}$ izR;sd jkT; mRiknu dsUnz] jkT;karxZr mRiknu dsUnz dks vxys fnu
ds fy, fofHkUu le; [kaMks esa] esxkokWV eas ,Dl ikWoj la;a= izes"k.k lkj.kh
 $\frac{1}{4}$ IykaV fMLisp 'ksM~;wy $\frac{1}{2}$ A fgrxzkfg;ksa@Fkksd miHkksDrkvksa }kjk
,Dl ikWoj IykaV vkgj.k $\frac{1}{4}$ M^aky $\frac{1}{2}$ lkj.kh ds lq>ko ds ;ksx $\frac{1}{4}$ les'ku $\frac{1}{2}$
dsUnzokj ,Dl ikWoj IykaV izes"k.k lkj.kh gksxhA

$\frac{1}{4}$ ch $\frac{1}{2}$ izR;sd fgrxzkgh@Fkksd miHkksDrk ds fy,]
vxys fnu ds fofHkUu le; [kaMks ds fy, lkj.kh dk fu/kkZj.k mRiknu
dsUnzokj jkT; mRiknu dsUnzksa] jkT;karxZr mRiknu dsUnzokj jkT;
ikoj IykaVokj] lkj.kh rFkk jkT; fxzM ls nh?kZ] e/;e] y?kq vof/k ds vU;
vksiu ,Dlsl ds rgr vkgj.k $\frac{1}{4}$ M^aky $\frac{1}{2}$ ds ;ksx ij izkfDyr ikjs"k.k gkfu de dj nh
tk,xhA

6-5 jkT; ds mRiknu dsUnz] jkT;karxZr mRiknu dsUnz] fgrxzkgh vkSj cMs+
miHkksDrk izes"k.k@ vkgj.k $\frac{1}{4}$ M^aky $\frac{1}{2}$ 'ksM~;wy dh iwoZn`"V {kerkvksa esa
gksus okys fdUgh lq/kkj@ifjorZu ;fn dksbZ gksa dh tkudkj ,l-,y-Mh-lh- dks jkf=
10 cts rd vFkok ;Fkk laHko igys nsaxsA

6-6 mRiknu dsUnzksa ds fy, mi;qZDr nSfud tujs'ku 'ksM~;wy dks vafre :i nsrs
le; ,l-,y-Mh-lh- ;g lqfufpr djsxk dh os lapkyu dh n`f"V ls mi;qDr gksa fo'ks"kdj
jSafiaxvi@jSafiaxMkmU nj rFkk U;wure vkSj vf/kdre~ mRiknu Lrj ds
vuqikr ds laca/k esaA

6-7 ,l-,y-Mh-lh- dks jkr 11 cts rd vxys fnu ds fy, vafre izes"k.k@ vkgj.k $\frac{1}{4}$ M^aky $\frac{1}{2}$
'ksM~;wy dh tkudkj jkT; mRiknu dsUnzksa] jkT;karfjd foØsrkvksa]
fgrxzkfg;ksa rFkk jkT;karfjd Øsrkvksa dks nsuh gksxhA

6-8 jkT;karfjd ikjs"k.k $\frac{1}{4}$ tSlk ,l-,y-Mh-lh- }kjk izekf.kr gS $\frac{1}{2}$ vFkok forj.k
vuqKflr/kkj fhls mRiknu esa deh djus dh vko';drk gS vFkok jkT; ikjs"k.k miØe
jkT;karxZr ikjs"k.k ls lEc) $\frac{1}{4}$,l-,y-Mh-lh- ls izekf.kr $\frac{1}{2}$ vU; ikjs"k.k vuqKflr/kkj
vFkok forj.k vuqKflr/kkj ds LokfeRo ds lac) fLop;kMZ vkSj midUnzksa ij
fdlh ck/kk] vkmVst] foQyrk vFkok ikjs"k.k iz.kkyh dh lhekvsda ds dkj.k ikWoj
 $\frac{1}{4}$ fudklh $\frac{1}{2}$ bosD;qos'ku esa dksbZ dfBukbZ mRiUu gksus dh n'kk esa ;fn tujs'ku
esa deh djus dh vko';drk iM+s rks ,l-,y-Mh-lh- ,slh vuqlwfp;ksa dks iqujhf{kr
djsxk tks ml VkbZe CykWd ls x.kuk djrs gq, ftlesa ikWoj ds fudklh dh leL;k
loZizFke mRiUu gqv] ls pkSFks VkbZe CykWd ls izHkko'khy gksxhA ;g Hkh fd
igys] nwljs vkSj rhljs VkbZe CykWdksa esa ,slh n'kk esa tujsVjksa $\frac{1}{4}$ lhthih dks
lekfo"V djrs gq, $\frac{1}{2}$ dk vuqlwfp mRiknu] okLrfod mRiknu ds leku iqujhf{kr fd;k

eku fy;k tk,xk] vkSj fgrxzkfg;ksa@Øsrkvksa dh vuqlwfp vkGj.kksa^{1/4}M^akYl^{1/2}
dks m~uqlkj iqujhf{kr fd;k eku fy;k tk,xkA

fxzM O;o/kku ds izdj.k esa leLr mRiknu dsUnzksa ^{1/4}lhthih dks lekfo"V djsr
gq,^{1/2} dk vuqlwfp mRiknu vkSj leLr fgrxzkfg;ksa@Øsrkvksa dh vuqlwfp
vkgj.k^{1/4}M^aky^{1/2} dks fxzM O;o/kku ds leLr izHkkfor VkbZe CykWd esa
okLrfod mRiknu@ vkgj.k^{1/4}M^aky^{1/2} ds leku iqujhf{kr fd;k eku fy;k tk,xkA
fxzM O;o/kku vkSj mldh vof/k dks ,l-,y-Mh-lh- }kjk izekf.kr fd;k tk,xkA
jkT; Hkkj iszs"k.k dsUnz }kjk tkjh@iqujhf{kr mRiknu vuqlwfp;ka vkSj
vkgj.k^{1/4}M^aky^{1/2} vuqlwfp;ka fufnZ"V le; CykWd] pkgs lapkj dh lQyrk dqN
Hkh gks] ls izHkko'khy gksaxhA

6-9 mi;qZDrkuqlkj vkgj.k^{1/4}M^aky^{1/2} vkSj izs"k.k vuqlwfp;ksa dks vafre :i nsrs le;
,l-,y-Mh-lh- ;g Hkh tkWp djsxk fd ifj.kkeh ÅtkZ izokg dh otg ls ikjs"k.k esa dksbZ
:dkoV u gksA fdlh izdj.k esa ;fn xSj vuqefr ;ksX; ck/kk,a iwoZn"V dh tkrh
gSa rks ,l-,y-Mh-lh- okafNr lhek rd ,slh vuqlwfp;ksa esa lacaf/kr jkT;karfjd
mi;ksxdrkZvksa dks lwfpr djsr gq, deh djsxkA

6-1010 lapkyu fnol dh lekflr ij] 24-00 ?kaVs rd] ^{1/4}jkT; mRiknu dsUnz ds izdj.k
esa ih..O dks lfEefyr dñs gñ.^{1/2}l tuisfVax dsUnz dk fMLisn 'ksM~;wv rFkk
'ksM~;wy esa rF; ifjorZu dks /;ku esa j[k] ,l-,y-Mh-lh- }kjk fnu esa varr%
vuqikfyr vuqlwph tkjh djuk pkfg;sA ,l-,y-Mh-lh- dh osclkbZV ij vuqlwph ds
izdk'ku ds rhu fnol ds Hkhrj ikbZ xbZ@/;ku eas vkbZ fdlh =qfV@pwd ds
izdj.k esa ,l-,y-Mh-lh- }kjk mldh tkWp vkSj lq/kkj dk;Z dj fy;k tk,xkA ;g
vuqlwph okf.kfT;d ys[kkadu ds fy, vk/kkj gksxkA ,l-,y-Mh-lh- dks izR;sd
tujsfVax dsUnz ds fy, oLrqfLFkfr ij vk/kkfjr vkSlr ,Dl cl {kerk Hkh odZ
vkmV djuk pkfg;sA

6-1111 ,l-,y-Mh-lh- mi;qZDr lHkh lwpukvksa vFkkZr jkT; mRiknu dsUnz]
ikT:karxZr mRiknu dsUnz }kik lwfpr dsUnzoki iwoZn"V ^{1/4}Oksilhu^{1/2}
miHkksDrkvksa }kjk iznUk lHkh vkgj.k^{1/4}M^aky^{1/2} 'ksM~;wy] ,l-,y-Mh-lh-
{kjk tkjh] mijksDr lHkh la'kksf/kr@ v|ru 'ksM~;wy dk leqfpr izi=
^{1/4}MkD;wesaV^{1/2} rS;kj djsaxsA

6-1212 ,sls ck;ksekl] LekWy gk;My] ok;q ^{1/4}fo.M^{1/2} lksyj rFkk cxklh vk/kkfjr
ikWoi LVs'ku tks ikT: esa izfr"Bkfir fd. x. gSa vkSi tks ikT: esa fdllh fori.k
dj jgs gSa] os vk;ksx ds ;Fkk izpfyr vkns'kksa ds vuqlkj fo|qr dk iznk; djsr jgsaxsA

6-1313 varj jkT;h; ,chVh Ldhe ds varxZr vkus okys leLr tujsVjksa ds fy,
vuqlwphdi.k ^{1/4}'ksM~;wfvax^{1/2} rFkk :-wvkbZ- izHkkiksa ds okf.kfT:d
ds fofu;eu iz;ksT; gksaxsA

6-1414 tujs'ku mRiknu dk vuqlwph ls fopyu dk fjdkMZ la/kkj.k rFkk fuxjkuh
dk:Z .l-.v-Mh-lh- disxkA ikT:karfid mi:ksxdrkZ }kik vk:ksx ds vksiu .Dls
;Fkk izdj.k] ih-ih,- dh 'krksZa ds vuqlkj ykxw nj ij lacaf/krksa dks Hkqxrku
fd;k tk,xkA jkT;@jkT;karxZr mRiknu dsUnz] ftu ij dñsflVh pktZ vkSj ,uthZ
pktZ ^{1/4}gkbM^aksLVs'kuksa dks NksM+dj^{1/2} nks Hkkxksa esa VSfjQ yxrk gS
dh ?kksf"kr {kerk vkSj fgrxzkgh@Fkksd miHkksDrk }kjk ekax

$\frac{1}{4}$ fjD;wts'ku $\frac{1}{2}$] dk iqujh{k.k fnu dh 'ks"k vof/k ds fy, iwoZ lwpuk ij vuqefr ;ksX; jgsxkA ,sls izdj.kksa esa iqujhf{kr vuqlwfp;ka@?kksf"kr {kerk NVos VkbZe CykWd ls izHkko'khy gksxh vkSj ,sls VkbZe CykWd dh fxurh ,l-,y-Mh-lh- esa izkIr iqujh{k.k ds vuqjks/k dh izkfIr ds Vkke CykWd ls igyk eku dj fxurh esa fy;k tk,xkA

6- 1515 rqPN iqujh{k.k $\frac{1}{4}$ fjotuksa $\frac{1}{2}$ dks grksRlkfgr djus dh n`f"V ls ,l-,y-Mh-lh- vius laiw.kZ Loofoosd ls iwoZorhZ vuqlwph@{kerk ds 02%ls de dh badkj dj ldsxhA rkih; mRiknu dsUnzksa esa bZa/ku dh deh dks n'kkZrs gq, viuh ?kksf"kr {kerk dh vuqlwph esa ,l-,y-Mh-lh- @ vkj-,y-Mh-lh- dks lwfpr djus okyksa ds fy, iqujh{k.k rc rd ugha gksxk tc rd mRiknu bdkbZ esa cykr~ $\frac{1}{4}$ QkslZ $\frac{1}{2}$ vkmVst dk izdj.k ugha gksA

6- 1616 ,l-,y-Mh-lh- lkof/kd :i ls izz"k.k vkSj 'kq) vkgj.k $\frac{1}{4}$ M^aky $\frac{1}{2}$ vuqlwfp;ksa esa ga. okLrfod laifiorZu dk iquih{k.k :g tkWous ds fv. disxh fd D:k fdlh }kjk vuqfpr [ksy $\frac{1}{4}$ vuQs;j xsfeax $\frac{1}{2}$ vFkok lkWB&xkWB rks ugha dh tk jgh gSA ;fn ,slh dksbZ ckr idM+ esa vk, rks ekeys dk izfrosnu vxsZrj TkkWp@dk;Zokgh ds fy, vkjihlh vkSj lh-,l-bZ-vkj-lh- dks Hkstk tk,xkA

6- 1717 tc vkSj tSlk jkT; Hkkj izz"k.k dsUnz }kjk dgk tk, rks jkT;@jkT;karxZr mRiknu dsUnz o mi:ksxdrkZ fxzM baViOsl fcUna ii bldh ?kksf"kr {kerk jkT;karfjd mi:ksxdrkZ ,slh ?kksf"kr {kerk dks iznfkZr djus esa foQy jgrk gS rks naM ds :i eas tujsVj ds {kerk izHkkj de dj fn, tk,axsA

6-18181818 vuqKfIr/kkjh }kjk fnol iwoZ vuqlwph&

;fn vuqKfIr/kkjh dh iz.kkyh esa vfrfjDr {kerk miyC/k gS ftls ;k rks iw.kZr% vFkok va'kr% vfHkO;Dr :i ls lefiZr fd;k x;k gS] vFkok iwoZ esa rhu fnol ls vf/kd vof/k esa mi:ksx esa ugha fy;k x;k gS rks ,sls izdj.k esa fnol&iwoZ laO;ogkj $\frac{1}{4}$ V^akatsD'ku $\frac{1}{2}$ dh vuqefr jgsxhA

,sls vkciu ,Dlsl dh Lohd`fr ds fy, vkosnu vuqlwphdj.k dh fnukad ls rhu fnol ds Hkhrj] fdUrj fnol iwoZ laO;ogkj gsrq vuqlwphdj.k ds Bhd iwoZ fnol 13-00 cts ds ckn ugha] ,l-,y-Mh-lh- dks izLrq fd;k tk ldsxkA

mnkgj.k ds fy, tqykbZ dh 25oha fnol dks fnol iwoZ laO;ogkj gsrq vkosnu 22os fnol vFkok 23os fnol vFkok ml ekg ds 24os fnol ds 13-00 cts rd izkIr fd, tk,axsA

dUts'ku ds fy, uksMy ,tsalh tkWp djsxh vkSj vuqeksnu dh Lohd`fr vFkok vU;Fkk dks] foLr`r izfO;k }kjk vuqeksfnr izk:i esa lwfpr djsxhA y?qk vof/k dh vkciu ,Dlsl gsrq leLr vU; izko/kku ykxw gksaxsA

6- ikoj rFkk oksYVst fu;a=.k%

1919 1- jkT; fxzM ls oh-,vkj- vkgj.k@'kks"k.k ds lEcU/k esa ,l-,y-Mh-lh- 1818 dk vuqiky djuk gksxkA 97 izfr'kr oksYVst ds uhps oh-,vkj- mi:ksx rFkk 103 izfr'kr fu/kkZfjr oksYVst ls Åij oh-,vkj- ds izz"k.k $\frac{1}{4}$ baTksD'ku $\frac{1}{2}$ ls cpuk pkfg;sA

2- lHkh forj.k ykbZlsalh] V^akaleh'ku ykbZlsalh rFkk ,l-Vh-;w- ls vis{kk dh tkrh gS fd os LFkkuh; ¼yksdy½ oh-,-vkj- {kfriwfrZ ¼dEiulslu½ miyC/k djkos] rkfd os vfr mPpnkc fxzM ls oh-,-vkj- M^ak ugh djsA fuEufyf[kr Øe esa oh,vkj dEiUklsu gksxk%&

- (i) miHkksDrk Nksj
- (ii) forj.k V^akalQkeZj Nksj
- (iii) 11@33 dsoh midUnz ;k 11 dsoh forj.k QhMj ij
- (iv) vfr mPpnkc mi&dsUnz
- (v) tujsfVax dsUnz

3- jkT; ikjs"k.k miØe ¼lh-Vh-;w-½ ds lHkh 400@220 fdyks oksYVst vkbZ lh Vh ij VSi ifjorZu jkT; Hkkj ikjs"k.k dsUnz ds vuqns'kksa ds vuqlkj gksaxsA

4- dsfIVo tujsfVax IykaV dks NksM+dj vU; tujsfVax dsUnz }kjk vius vius {kerk lhek ¼dsisfcfyVh fyfeV½ ds Hkhrj ,l-,y-Mh-lh- ds vuqns'kks ds vuqlkj izfrfØ;k'khy ikWoj tujsV@,ctkcZ djuk pkfg;sa ,sls oh,vkj tujs'ku@,ctkcZ'ku ds fy;s dksbZ Hkqxrku tujsfVax daiuh dks ugha fd;k tk,xk A

5- oh-,-vkj- dEisuls'ku b,poh cl ij ikWoj QSDVj 0-98- rFkk mlls vf/kd esUVsu djus ds fy, ykxw fd;k tk,xkA

6- eqn~nksa dk vikyu%

2020 (i) ,l-,y-Mh-lh- }kjk vk;ksx dks jkT; fxzM lafgrk ds fdlh Hkh izko/kku vFkok xaHkhj mYy?kau ds ekeys vkSj ,l-,y-Mh-lh- }kjk fxzM lapkyu o mlds LFkkf;Ro dks lqfufpr djus vkSj jkT; esa ÅtkZ iz.kkkyh ds lapkyu esa n{krk rFkk vf/kdre ferO;f;rk gsrq fu;a=k o vuqiky ds mn~ns'; ls fn, x, fn'kk funsZ'kksa ds lrr~ vikyu ds ekeys fjiksVZ fd, tk,axsA

(ii) vk;ksx mi;qZDr ¼i½½ esa lanfHkZr ,l-,y-Mh-lh- dh fjiksVZ izkIr gksus ij leqfpr dk;Zokgh izkjaHk djsxkA

(iii) ,l-,y-Mh-lh- vFkok fdlh vU; O;fDr }kjk jkT; fxzM lafgrk ds fdlh izko/kku ds vikyu dh n'kk esa ,slk ekeyk fdlh Hkh O;fDr }kjk lh,lbZvkjll dks fjiksVZ fd;k tk ldsxkA

(iv) bu fofu;eksa esa fdlh vU; ckr ds gksrs gq, Hkh vk;ksx jkT; fxzM lafgrk ds fdlh izko/kku ds vikyu dh n'kk esa] ,sls O;fDr ds fo:) Lor% ¼lwvks&eksVks½ dk;Zokgh dj ldsxkA

6-21212121 ns; jkf'k dk Hkqxrku u djuk&k&k&k&

fdlh Hkh jkT;karfjd mi;ksxdrkZ@vksiu ,Dlsl miHkksDrk }kjk vksiu ,Dlsl izHkkjksa] xSj vuqlwfr varj ifjorZu ¼;w-vkbZ-½izHkkj] vkfn dk Hkqxrku u djus vFkok Hkqxrku djus esa vlkekU; foyac dh n'kk esa] izHkkfor i{kdkj] izdj.k dh fjiksVZ vk;ksx dks lE;d funsZ'kksa ds fy, djsxkA

&&000&&

v/;k;&7
izksVsD'ku
lafgrk

7-1 lkekU; fl)kar&

fdlh Hkh buVkbZVh ds iz.kkyh esa gksus okys nks" k ds laHkkfor xaHkhj
baVj;wtj ckm.M^h fjij'd'ku ds dkj.k] baVjQsl leL;k ds lek/kku ds :i esa
izksVsD'ku ekud dks ekuk tkrk gSA bl /kkjk esa U;wure izksVsD'ku vko';drk
fu/kkZfjr gS] D;ksafd fdlh buVkbZVh ds izksVsD'ku iz.kkyh esa vi;kZIr
izksVsD'ku vFkok dqizpkyu dk nwjxkeh ifj.kke] O;o/kku ¼fMLVjcsUl½
rFkk vU; buVkbZVh ds iz.kkyh esa Hkh Hkkjh uqdlku gks ldrk gSA
fo|qr midj.k ds fdlh Hkh Hkkx dks jkT; ikjs" k.k iz.kkyh ls rc rd la;ksftr jgus
dh vuqefr dnkfi ugh gksxh] tc rd fd bls U;wure mYysf[kr fo'oluh;] mRd' "V]
xfr'khy o laosnu'khy izksVsD'ku iz.kkyh ls ;qDr u fd;k x;k gksA dsUnzh;
fo|qr izkf/kdj.k ¼fo|qrx` gksa rFkk fo|qr ykbZuksa ds fuekZ.k gsrq rduhdh
ekun.M½ fofu;e] 2010 esa mYysf[kr izko/kkuksa dk ikyu djuk gksxk A leLr
mRiknu daifu;ka vkSj forj.k vuqKfIr/kkj] izksVsD'ku gsrq lgh vkSj leqfpr
fu/kkZj.k ¼lsfVax½ djs ds fy, ikjs" k.k vuqKfIr/kkj ds lkFk lg;ksx djsaxs
ftlls bl lafgrk ds vuqPNsn 7-4 esa fofufnZ"V le; ds Hkhrj izHkkoh :i ls p;u dj
=qfViw.kZ ykbZu@midj.k dks foyx djs] dh dk;Zokgh dh tk ldsA
bl /kkjk esa mYysf[kr] [kjc midj.k dks izHkkoh :i ls p;u dj fu/kkZfjr le; ds
Hkhrj foyx djs gsrq lHkh jkT;karfjd mi;ksxdrkZvksa }kjk izksVsD'ku ds
lgh o mi;qDr lsfVax lqfuf'pr djs vfuok;Zr% lg;ksx djuk gksxkA
lHkh izHkkoh jkT;karfjd mi;ksxdrkZ ls ijke'kZ o lgef'r ds fcuk izksVsD'ku
lsfVax dks u cnyk tkos u ckbZikl fd;k tk;s rFkk@vFkok u gh foPNsn fd;k
tk;sA tgka lgef'r ds vk/kkj ij izksVsD'ku iz.kkyh vLFkbbZ :i ls ckbZikl fd;k
x;k gS rFkk@vFkok foPNsn fd;k x;k gS] rc ftruh tYnh gks lds bls dkj.k
nwj dj ysuk pkfg, rFkk izksVsD'ku dh cgkyh lkekU; djuh pkfg;sA ;fn bl
lEcU/k esa lgef'r ugh gksrk gS rks rRdky fo|qr midj.k dks lsok ls gVk fn;k
tk,xkA

7-2 fuEufyf[kr ds laca/k esa jkT; ikjs" k.k

miØe ¼, l lykg dk vuqiky djsxk %

- 1- jkT; ikjs" k.k iz.kkyh esa fxzM O;o/kku rFkk vkaf'kd@iw.kZ Cysd
vkmV ds fo'ys" k.k ij vk/kkfjr izksVsD'ku iz.kkyh ds mUu;u o l'kfDrdj.k
ds fy, ;kstukA
- 2- vkbZysfMax o flLVe blfYV ;kstuk rFkk vaMj fQzDosalh fjys o
Mh,Q@MhVh fjys yxkus dh ;kstukA
- 3- fofHkUu midsUnzksa esa yxs vkbYksfMax Ldhe] fMLVjcsal fjdkMZj
rFkk QkYV ykdsVj ds fy, yxk, x, fjys] yksM 'ksfMax ds fy, yxk, x, vaMj
fQzDosalh fjys dk ijh{k.k ¼VsflVax½ rFkk ifjx.kuk ¼dsfyczs'ku½

fd;k tkuk pkfg,] izksVsD'ku izsfDVlsl ,oa izksVksdky esU;wvy esa budk lekso'k gksuk pkfg,A

7-3 izksVsD'ku leUo;u (Protection Coordination)&

jkT;karfjd mi;ksxdrkZvkSa }kjk ,l-,y-Mh-lh- ds funZs'kkuqlkj fdlh izksVsD'ku laca/kh [kjkch dks nwj djus ds fy, rRijrkiwoZd dk;Zokgh dh tk,xhA mRiknu bdkbZ ls yxkdj 132 dsOgh@ 33 dsOgh vkSj 11 dsOgh dh ykbZu ds nwj Nksj rd izksVsD'ku fjys dh lsfVax bl izdkj dh tkuh pkfg, ftlls lHkh ifjLFkfr;ksa esa ek= =qfV;qDr Hkkx dks vyx fd;k tk ldsA ikjs"k.k vuqKflr/kkjh izkfjHkd lsfVaxl rFkk le;≤ ij gksus okys ckn ds ifjorZuksa dks jkT;karfjd mi;ksxdrkZvkSa esa vf/kLwfr djsxkA izksVsD'ku fjys ds dk;Z fu"iknu dh

fu;fer tkWp dh tk,xh rFkk dksbZ [kjkch] ;fn gks rks mls vafdr fd;k tk,xk rFkk ;Fkk'kh?kz lq/kkj tk,xkA ikjs"k.k vuqKflr/kkjh fjys lsfVaxl dk fu'p; djus gsrq jkT;karfjd mi;ksxdrkZvkSa ls izklr vkdaMksa dk okafNr v;;u dj,xkA leLr jkT;karfjd mi;ksxdrkZvkSa ds izfrfuf/k lkoF/kd :i ls feydj ,slh [kjkfc;ksa] iz.kkyh ds <kaps ¼dkWufQxjs'ku½ esa ifjorZuksa] ;fn dksbZ gksa vkSj fjys dh laHkkfor iqjhf{kr lsfVaxl ds laca/k esa ppkZ djsaxsA

ikjs"k.k vuqKflr/kkjh] mRiknd daifu;ksa vkSj forj.k vuqKflr/kkj;ksa ds lkFk izksVsD'ku leUo; ¼dksvkfMZus'ku½ ds laca/k esa fopkj foe'kZ djus gsrq lkoF/kd cSBdsa vk;ksftr djus gsrq mRrnk;h gksxkA ikjs"k.k vuqKflr/kkjh izksVsD'ku laca/kh fdlh [kjkch vFkok vU; vlarks"ktud izksVsD'ku eqn~nksa dh tkWp dj,xkA lacaf/kr vuqKflr/kkjh bulkef;d cSBdksa esa fopkj foe'kZ o lgeftr tU; fdlh leL;k vFkok izksVsD'ku [kjkch dks lq/kkjus ds laca/k esa Rofjr dk;Zokgh vfuok;Zr% djsxkA

7-4 QkYV Dyh;jsal le; rFkk vYidkfyd jsfVax (Fault clearance time and short time rating)&

LFkkf;Ro dh n`f"V ls] U;wure 'kkVZ lfdZV djsaV jsfVax rFkk le; o jkT; ikjs"k.k iz.kkyh ls lh/ks tqM+s fdlh jkT;karfjd mi;ksxdrkZ iz.kkyh esa [kjkch dh fLFkfr esa vf/kdre QkYV Dyh;jsal le; rFkk Lo;a jkT; ikjs"k.k iz.kkyh esa dksbZ [kjkch gksus ij dsUnzh; fo|qr izkf/kdj.k ¼fo|qrx`gksa rFkk fo|qr ykbZuksa ds fuekZ.k gsrq rduhdh ekun.M ½ fofu;e] 2010 vkSj dsUnzh; fo|qr izkf/kdj.k¼fxzM ekun.M½ fofu;e] 2010 ds lanHkZ fuEukuqlkj gaS %

ukfeuy oksYVs t	U;wure 'kkVZ lfdZV djsaV jsfVax rFkk fLopxs;j dh vof/k	lhch gsrq vf/kdre~ jsVsM czsdVkbZe	izkFkfed ¼izksVsD'ku ½ ls vf/r
KV	KA (rms)	Second(s)	m.sec.
765dsoh	40vkSj 50	1	40
400dsoh	40 vkSj 50	1	40
220dsoh	40	1	60
132dsoh	31-5	1 vFkok3	100

jkT;karfjd mi;ksxdrkZ iz.kkyh ij [kjkch ds fy, eanxfr QkYV Dyh;jsal le; ij lgefz gks ldrh gS] ijUrq og rHkh tc ,l-Vh;-w- ds fopkj esa] iz.kkyh dh ifjLFkfr bl gsrq vuqefr nsA ikjs"k.k iz.kkyh ls lh/ks tqM+s forj.k daiuh@vksiu ,Dlsl dLvej rFkk ,lVh;w ds fy, fofHkUu LFkyksa ij lfdZV cszsj dh visf{kr vksifuax le; o jipfjax {kerk dk fu/kkZj.k ,l-Vh;-w- djsxkA fdlh Hkh lcLVs'ku esa lfdZV cszsj dh nf'kZr $\frac{1}{4}$ jsVsM $\frac{1}{2}$ jipfjax {kerk lcLVs'ku ds QkYV $\frac{1}{4}$ Lrj $\frac{1}{2}$ ysoy ds 120 izfr'kr ls de ugha gksuh pkfg, $\frac{1}{4}$ 20 izfr'kr vf/kd dk izko/kku Hkfo"; esa iz.kkyh esa o'f) gksus ij c<+us okys QkYV Lrj dks /;ku esa j[k dj fd;k x;k gS $\frac{1}{2}$ A tujsfVax dsUnz esa flaØksfute cuk;s j[kus ds fy, ykbZu QkYV] fØfVdy Dyh;fjax VkbZe ds Hkhrj tujs'ku dsUnz Nksj ij gh Dyh;j fd;k tkuk pkfg;sA

7-5 tujsVj izksVsD'kudh vko';drk

lhchvkbZih ds 274 la[d izdk'ku ^^esU;wvy vku izksVsD'ku vkWQ tujsVlZ] tujsVj V^akalQkeZj] o 220 dsOH o 400 dsOH usVodZ^^ esa fyf[kr ekxZn'kZu dks vfuok;Zr% /;ku esa lnSo j[kk tkuk pkfg, rFkk dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ fo|qr la;a= o fo|qy ykbZu fuekZ.k gsrq rduhdh ekunaM $\frac{1}{2}$ fofu;e] 2010 le;≤ ij ;Fkk la'kksf/kr dk ikyu djuk pkfg,A jkT; ikjs"k.k iz.kkyh ls tqM+s lHkh tujsfVax bdkbZ o muds lHkh lacaf/kr fo|qr midj.k dh izksVsD'ku mi;qDr izksVsD'ku O;oLFkk ls dh tkuh pkfg;s rkfd tujs'ku bdkbZ ls 'kq: gq, fdlh izdkj ds O;o/kku ds dkj.k jkT; ikjs"k.k iz.kkyh esa dksbZ ladV mRiUu u gksA tujsVj izksVsD'ku ;kstuk esa de ls de] fMQjaf'k;y izksVsD'ku] csdvi izksVsD'ku] LVsVj vFkZ QkYV izksVsD'ku] fQYM xzkm.M@QhYM QSY;wj izksVsD'ku $\frac{1}{4}$ cz'k&ysl ,DlkbZVs'ku iz.kkyh ij viz;ksT; $\frac{1}{2}$] usxsfVo fIDosUl izksVsD'ku] v.Mj fQzDosalh] vksOgj ¶lyDI izksVsD'ku] csdvi bfEiMsUl izksVsD'ku rFkk ikSy fLyfiAx izksVsD'ku $\frac{1}{4}$ 200 esxkokV ls Åij bdkbZ esa iz;ksT; $\frac{1}{2}$] ykWl vkWQ fQYM izksVsD'ku] fjo'kZ ikWoj izksVsD'ku vkfn vfuok;Zr% lekfgr gksaxsA mRiknu la;a= ds fo|qr izksVsD'ku dk;Z $\frac{1}{4}$ bysfDV^ady izksVsD'ku QaD'ku $\frac{1}{2}$ dh lwph dk vuqlj.k dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ fo|qrx'gksa rFkk fo|qr ykbZuksa ds fuekZ.k gsrq rduhdh ekun.M $\frac{1}{2}$ fofu;e] 2010 esa fofufnZ"V fd, vuqlkj gksxkA

7-6 ikjs"k.k ykbZu dh izksVsD'ku

7-6-1 lkekU;

ikoj LVs'ku vFkok midsUnz ls fudyh izR;sd bZ,poh ykbZu esa fuEufyf[kr izksVsD'ku o csdvi izksVsD'ku yxs gksuk pkfg,A le; le; ij izksVsD'ku ij vius uhfr esa fdlh rjg ds ifjorZu ls jkT;karfjd mi;ksxdrkZ dks jkT; ikjs"k.k miØe voxr dj,xkA

ikoj TkujfVax dsUnz ls fudyus okyh ,l-Vh;-w- dh ykbZu ds izksVsD'ku ds fy, fjys isuy dk LokfeRo tujsVj dk gksxk vkSj mldk j[kj[kko Hkh mlds gh }kjk fd;k tkosxkA V^akaleh'ku ykbZu ls lacaf/kr fjys lsfVax vFkok fjys lsfVax esa dksbZ ifjorZu tujsVj }kjk ,l-Vh;-w- ls l'ku leUo;u o mlds lykg ls o vuqeksnu i'pkr~ gh fd;k tkosxkA oso Vs^aIl o lapkj dscy lfgr dsfj;j

dsfcusV@midj.k] ykbZu esfpax ;wfuV dk LokfeRo rFkk mldk la/kkj.k ,l-Vh-
;w- dk jgsxk] fllds fy, vk;ksx ls vuqeksfnr 'kqYd fy;k tk,xkA leLr tujsVj ,sls
dke ds fy, txg] dusD'ku lqfo/kk rFkk igqap] jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh-;w- $\frac{1}{2}$
dks vfuok;Zr% miyC/k dj,axsA
leLr jkT;karfjd mi;ksxdrkZ ikWoj flLVe esa] iz.kkyh izksVsD'kuLdheksa
dks $\frac{1}{4}$,l-ih-,l- $\frac{1}{2}$ $\frac{1}{4}$ baVjfV^afiak vkSj jucSd dks lfEefyr djrs gq, $\frac{1}{2}$ fpfUgr]
izfr"Bkfir vkSj izkjaHk djus dks lqfo/kktud cuk,axs rkfd viuh lhekvksa ds
fudV ikjs"k.k iz.kkyh lapkyu dj lds vkSj oksYVst dksysll rFkk egRoiw.kZ
dkjhMksjksa@¶yksxsV vkfn dh fV^afiak o dSldsM fV^afiak tSlh flFkfr;ksa ls
cpko gks ldsA ;fn fdllh iz.kkyh izksVsD'kuLdhesa $\frac{1}{4}$,l-ih-,l- $\frac{1}{2}$ dks lsok ls ckgj
fy;k tkuk gks rks ,slh lsok ls fudklh dh visf{kr vof/k vkSj dkj.k n'kkZrs gq, ,l-
,y-Mh-lh- ls vuqefr izklr dh tk,xhA

7-6-2 400 dsOgh ikjs"k.k ykbZu

IHkh ,lVh;w ds LokfeRo okys 400 dsOh V^akaleh'ku ykbZu esa nks QkLV
,fDVax izksVsD'ku ;kstuk gksxhA nksuksa fjys ds oksYVst dks ykbZu
lhohVh ds nks fofHkUu dksj ls QhM fd;k tkosxk rFkk nksuksa fjys ds djsaV
dks ykbZu lhVh ds nks fofHkUu dksj ls QhM fd;k tkosxkA esu 1 izksVsD'ku
Ldhe U;wesfjdy] 3 tksu] ukWu LohPM] QkLV ,fDVax] fMLVsal lqj {kk
;kstuk $\frac{1}{4}$ izksVsD'ku Ldhe $\frac{1}{2}$ lfgr tksu&2 QkYV ds izdj.k esa] fjeKsV Nksj ij
ijfefLkey varj fV^ai ;kstuk gksxh A esu 2 lqj {kk Ldhe ;k rks mlh izdkj dk
U;wesfjdy 3 tksu] uku LohPM] QkLV ,fDVax] fMLVsal lqj {kk Ldhe
 $\frac{1}{4}$ izksVsD'ku Ldhe $\frac{1}{2}$ rFkk tksu&2 QkYV ds izdj.k esa fjeKsV Nksj ij
ijfefLkey varj fV^ai ;kstuk gksxh vFkok V^akalh,UV oso fMVSD'ku]
Mk;jsD'kuy] dEiKsfjtu vFkok Qst dEiKsfjtu dsfj;j fjysf;ax Ldhe ;qDr ;wfuV
izksVsD'ku Ldhe gksxhA ,d ikSy fV^afiak ,oa flaxy 'kkV vkVks fJDyKsflax]
,MtLVscy MsM VkbZe lfgr gksuk vko';d gSA
LVsMh LVsV rFkk V^akaft;sUV vksOgj oksYVst jkbZt ds fy, vksOgj
oksYVst fjys Hkh yxkuk gksxkA
400 dsOh rFkk 220 dsOh iz.kkyh esa cszdy cSdvi izksVsD'ku lnSo yxkuk
gksxkA
400 dsOh ykbZu@220 dsOh ykbZu ds izksVsD'ku esa dSfj;j ds ek;/e ls
baVjfV^aIk O;oLFkk gksuh pkfg;s rkfd ykbZu ds ,d Nksj dk fV^afiak dks vU;
Nksj ij Hkh V^akalehV gks ldsA

7-6-3 400 dsOgh cl

IHkh 400 dsOh lcLVs'ku esa V^akaleh'ku ykbZu ds fy, vkWVksfjDykst+j lfgr
yksdy czsdy cSdvi $\frac{1}{4}$,y-ch-ch- $\frac{1}{2}$ o cl ckj fMQjsafl;y izksVsD'ku ;kstuk Hkh
vfuok;Zr% gksuh pkfg,A

7-6-4 220 dsOgh ikjs"k.k

IHkh ,lVh;w ds LokfeRo okys 220 dsOh V^akaleh'ku ykbZu esa] flaxy]
U;wesfjdy] 3 tksu] uku LohPM] QkLV ,fDVax fMLVsal] izksVsD'ku Ldhe]

izFker% Lohdk;Z baVjV^ahi Qhpj lfgr fjeksV Nksj ij ¼tksu 2 QkYV ds izdj.k
 esa ½ flaxy iksey fV^afiar o flaxy 'kkV flaxy iksey vkVks fjDyksftax
 ,MtsLVscy MsM VkbZe lfgr vo'; gksuk pkfg;sA
 csdvi izksVsD'ku ds fy, rhu Mk;jsD'kuy vkbZMh,eVh vksOgj djsaV fjys
 rFkk ,d Mk;jsD'kuy vFkZ QkYV fjys gksuk pkfg;sA
 NksVs ¼'kkVZ½ V^akalfe'ku ykbZu ds fy, mi;qDr oSdfYid izksVsD'ku ;kstuk
 viukbZ tk ldrh gSA

7-6-5 220 dsOgh cl

p;fur egRoiw.kZ 220 dsOh midsUnz ¼tSls tujs'ku buQhM ;qDr] ihtlhlvkbZ,y
 baVjQsflax midsUnz vkfn½ esa V^akalfe'ku ykbZu ds fy, ,ychch o
 vkVksfjDyktj lfgr cl ckj fMQjsafl;y izksVsD'ku ;kstuk gksuh pkfg;sA

7-6-6 132 dsOgh ykbZu

,dy 3 tksu] LohPM@uku LohPM LVsfVd fMLVsal izksVsD'ku ;kstuk eq[;
 izksVsD'ku ds :i esa vo'; miyC/k gksuk pkfg;sA csdvi izksVsD'ku esa de ls
 de 2 Mk;jsD'kuy vkbZMh,eVh vksOgj djsaV fjys rFkk 1 Mk;jsD'kuy vFkZ
 QkYV fjys gksuk pkfg;sA
 NksVs V^akaleh'ku ykbZu ds fy, mi;qDr osdfYid izksVsD'ku ;kstuk vo';
 viukbZ tkuh pkfg;sA

7-7 izksVsD'ku dh vko'drk,a&

- (i) vkVks V^akalQkeZj] ikoj V^aklQkeZj rFkk forj.k V^akalQkeZj dh
 izkf/kdj.k ¼fo|qr la;a= rFkk fo|qr ykbZu fuekZ.k gsrq rduhdh
 ekinaM½ fofu;e] 2010 ;Fkk la'kksf/kr ds vuqlkj] gksuk pkfg;sA
- (ii) bZ,pVh Dykl ds vkVks V^akalQkeZj rFkk ikoj V^akalQkeZj dh leLr
 okbZfUMaXk dk izksVsD'ku ijlsaV ck;l rFkk gkeksZfud fjLVs^aUV Qhpj
 ;qDr fMQjsafl;y fjys }kjk fd;k tkuk pkfg;sA
- (iii) bZ,pVh V^akalQkeZj ds fy, vksOgj ¶yfDlax fjys miyC/k gksuh pkfg;sA
- (iv) lHkh 400 dsOh @200 dsOh Dykl V^akalQkeZj eas okbZfUMax ds fy,
 vfuok;Zr% fjfLV^aDVsM vFkZ QkYV ¼vkj bZ ,Q½ izksVsD'ku gksuh
 pkfg;sA
- (v) blds vfrfjDr mlesa csdvi buolZ MsfQfuV U;wure le; ¼vkbZ Mh ,e
 Vh½ vksOgj djsaV rFkk vFkZ QkYV izksVsD'ku gksuk pkfg;sA
- (vi) lekukarj lapkyu (Parallel Operation) ds fy, ,sls csdvi izksVsD'ku esa
 Mk;jsD'kuy Qhpj gksuk pkfg;sA gsOkh 'kkVZ lfdZV ds fo:) izksVsD'ku ds
 fy, tgka dgha Hkh vksOgj vkWy leUo;u (Overall coordination) dh vuqefr nsrk gS
 ogka vksOgj djsaV fjys esa gkbZ lsV balVsuVsfu;l ,fyesaV gksuk
 pkfg;sA rFkkfi] esxfuVkbZftax djsaV ds bujl (Inrush)ds dkj.k bls fV^ai ugha
 djuk pkfg;s rFkk bls ,sls mPpLrj ¼osY;w½ esa lsV ugh fd;k tkuk pkfg;s] tks
 V^akalQkeZj ds fgr esa u gksA

- (vii) blds vfrfjDr fo|qr izksVsD'ku esa] xSl vkijVsM fjys] okbZfMUx VsEijspj izksVsD'ku rFkk vkW;y VsEijspj izksVsD'ku Hkh vfuok;Zr% miyC/k gksuh pkfg;sA
- (viii) V^akalQkeZj ds fy, fUkEufyf[kr U;wure izksVsD'ku iznku djus dh flQkfj dh tkrh gS%&

$\frac{1}{4}, \frac{1}{2}$ IHkh 400 dsOH ikoj V^akalQkeZj esa fMQjsafly] vkjbZ,Q] vksiU MsYV^k $\frac{1}{4}$ U;wV^ay fMLIyslesaV fjys $\frac{1}{2}$ rFkk vksOgj ¶yfDlax fjys gksuk pkfg,A blds vfrfjDr cSdvi vkbZMh,eVh vksOgj djsaV rFkk vFkZ QkYV izksVsD'ku miyC/k gksuh pkfg;sA lekukarj izpkYu ds fy, ,sls cSdvi izksVsD'ku es ,pVh o ,yVh cszdlZ ds fy, baVjfv^afiAx gksuk pkfg;sA gsoh 'kkVZ lfdZV ls izksVsD'ku ds fy, vksOgj djsaV fjys esa gkbZ lsV bUIVsuVsFu;l ,fyesaV gksuk pkfg;sA fo|qr izksVsD'ku ds vykok V^akalQkeZj dh [kqn ds izksVsD'ku tSlS cWdksYTk] vksOgjyksM Vsi psatj $\frac{1}{4}$ vks,yVhlh $\frac{1}{2}$] vkW;y ltZ] xSl vkijVsM fjys] okbZafMax VsEijspj izksVsD'ku] vkW;y VsEijspj izksVsD'ku] isz'kj fjiyHq okYo $\frac{1}{4}$ ihvkjoh $\frac{1}{2}$ fMokbZl esa vykeZ o fV^ai QaDlu Hkh vfuok;Zr% miyC/k gksus pkfg;sA V^akalQkeZj VSad ds fy, Mcy ihvkjoh izksVsD'ku ;kstuk dh flQkfj dh tkrh gSA \

$\frac{1}{4}$ ch $\frac{1}{2}$ flok; vkjbZ,Q izksVsD'ku ds viii $\frac{1}{4}, \frac{1}{2}$ esa fyf[kr izksVsD'ku IHkh 220 dsOH Dykl ikoj V^akalQkeZj esa vfuok;Zr% miyC/k gksuk pkfg;sA

- (ix) vkbZlhVh dh MsYV^k Vj'kjh okbZafMax] ;fn yksfMax mn~ns'; ls mi;ksx dh tkrh gS rks mldk ykbZfVax vjsLVj] ltZ dsfilhVj rFkk U;wV^ay fMLIyslesaV fjys $\frac{1}{4}$,uMhvkj $\frac{1}{2}$ izksVsD'ku lfgr] ihVh dks vksiU MsYV^k okbZafMax ds :i esa dusDV dj vfuok;Zr% leqfpr izksVsD'ku fd;k tkuk pkfg,A

7-8 yksdy czsdj cSdvi lqj{kk $\frac{1}{4}$,ychch izizizizksVsD'ku

fdlh lfdZV czsdj ds izksVsDVo fjys ls fV^ai dekaM izklr gksus ij fV^ai foQyrk dh n'kk esa] =qfViw.kZ lfdZV czsdj ds cl lsD'ku ls la;ksftr IHkh lfdZV czsdj] ,ychch izksVsD'ku ds ek;/e ls U;wure~ laHko nsjh ls fV^ai gksus dh vko';drk gksxhA ,slh lqj{kk] lfdZV czsdj vkSj djsaV V^aklQkeZj ds chp ds nks"kkSa dks Hkh doj djrh gS] tks fd fdlh vU; izksVsD'ku ls doj ugha gks ikrs A 220 dsOgh vkSj 400 dsOgh- ds leLr lfdZV ds lkFk&lkFk 132dsOgh ds egRoiw.kZ ifjiFkksa ij Hkh yksdy czsdj cSdvi lqj{kk yxh gksuh pkfg, A

7-9 fMLVcsZal fjdkMZj] bosUV ykWxj rFkk VkbZe flaØksukbZts'ku midj.k& izR;sd 765 dsOgh- rFkk 400 dsOgh- ykbZu ds lkFk O;o/kku vfHkys[ku $\frac{1}{4}$ fMLVjcsal fjdkMZj $\frac{1}{2}$] QkYV yksdsVj ls nwjh vkSj VkbZe flaØksukbZts'ku midj.k $\frac{1}{4}$ Vh,lbZ $\frac{1}{2}$ dh lqfo/kk miyC/k djkuh gksxhA izR;sd 220 dsOgh- vkSj mPprj oksYVst Js.kh ds midSunz vFkok fLop;kMZ ij

bosUV YkkWxj] vyx ls vFkok midsUnz ds Hkkx ds :i esa vFkok fLop;kMZ Lopkfy iz.kkxh

ds :i esa miyC/k djkbZ tk,xhA midsUnz vFkok fLop;kMZ esa thih,l ds ek;/e ls flaØksukbZftax iYl izkIr dj bosUV ykWxj] fMLVcsZal fjdKMZj vkSj ,llh,Mh, $\frac{1}{4}$ LdkMk $\frac{1}{2}$ @ dh Lopkyhdj.k iz.kkxh dks flaØksukbZts'ku gsrq] VkbZe flaØksukbZts'ku midj.k dh lqfo/kk e; ,afVuk] leLr dscyksa vkSj izfØ;k midj.kksa vkfn ds lkFk miyC/k djkuh gksxhA

7-10101010 forj.k iz.kkfy;ksa esa V^akalQkeZj dh lqj{kk

forj.k iz.kkxh ij mPpnkc Js.kh ds NksVs V^akalQkeZjksa 10 MVA vkSj mlls vf/kd dh {kerk ij lekuakrj ifjpkYu gsrq fMQjsafl;y izksVsD'ku lfgr cSdvi VkbZe ysx vksoj djsaV vkSj Mk;jsD'kuy fQpj lfgr vFkZ QkWYV izksVsD'ku miyC/k dj;k tk,xkA 1-6 MVA {kerk vkSj vf/kd fdUr 10 MVAIs de {kerk ds V^akalQkeZjksa dh lqj{kk $\frac{1}{4}$ izksVsD'ku $\frac{1}{2}$ VkbZe ysx vksoj djsaV] vFkZ QkWYV rFkk baLVsVsFu;l izfrcf/kr $\frac{1}{4}$ fjlfVDVsM $\frac{1}{2}$ vFkZ QkWYV fjys }kjk dh tk,xhA

blds lkFk gh 1-6 MVA {kerk vkSj mlls vf/kd ds V^akalQkeZj ds lkFk Buchholtz Relays, okbafMax rFkk vkbZy VsEiszpj lqj{kk miyC/k djkbZ tk,xhA

7-11111111 forj.k ykbZuksa ij lqj{kk $\frac{1}{4}$ izksVsD'ku $\frac{1}{2}$

33 dsOgh vkSj 11 dsOgh- dh leLr ykbZuksa ds la;kstu fcUnqvksa@baVjQsl fcUnqvksa ij U;wure~ vksoj djsaV vkSj vFkZ QkWYV fjys fuEukuqlkj miyC/k dj;k, tk,axs%&

(i) QhMj%& lehi ds $\frac{1}{4}$,MtklsaV $\frac{1}{2}$ fjys lsfVaxl ds chp foHksn izkIr djus gsrq le;d~ lsfVaxl ds lkFk vFkZ QkWYV fjys rFkk ukWu&Mk;jsD'kuy vksoj djsaV fjysA

(ii) QhMj%& Mk;jsD'kuy VkbZe ysx vksoj djsaV vkSj vFkZ QkWYV fjys A

7-12121212 midsUnz dk Hkw

vfFkZax dh iz.kkxh dks U;wure 40 o"kZ dh thou izR;k'kk gsrq vkSj ,d lsdaM ds fy, 40 fdyks ,fEi;j ;k mlls vf/kd iz.kkxh djsaV ds fy, :ikafdr $\frac{1}{4}$ fMtkbZu $\frac{1}{2}$ fd;k tk,xkA daMDVj ds vkdkj dks fu'pr djrs le; vfFkZax daMDVj ds fy, mi;ksx esa ykbZ xbZ LVhy dh U;wure tax [kkus dh nj 0-12 feyhehVj izfro"kZ yh tk,xhA laiw.kZ dsUnz ds fy, xzkmafMax vkSj rfMr $\frac{1}{4}$ ykbZfVax $\frac{1}{2}$ lqj{kk lqlaxr Hkkjrh; ekud@vkbZ-bZ-bZ-bZ- ekunaMksa esa miyC/k vuqlkj jgsxhA

7-1313 ikjs"k.k ykbZuksa] V^akalQkeZjksa] fj;DVjksa vkSj cl ckjksa ds fy, izksVsD'ku fooi.k dsUnzh: folar izkf/kdi.k $\frac{1}{4}$ folarx`gksa rFkk folar fofufnZ"V fuEukuqlkj fn;k x;k gS%&

ikjs"k.k ykbZuksa] V^akalQkeZjksa] fj;DVjksa vkSj cl ckjksa ds fy,

1- ikjs"k.k ykbZu lqj{kk

1-Ø-	lqj {kk	765 kv	400kv	220kv	132 kv or 66 kv
¼d	esu&1 nwjh lqj {kk	Y	Y	Y	Y
¼[k ½	esu&1 nwjh lqj {kk vFkok fn'kkxr rgyuk lqj {kk vFkok Qst+ lsvzhvcsVc vkbZu	Y	Y	Y/N	Y
¼x ½	Mk;jsD'kuy baLVkVsfu;l MsfQusV fefuee VkbZe	Y	Y	Y;fn nksuksa] esu&1 vkSj esu&2 nwjh	N
¼?k ½	Mk;jsD'kuy baLVkVsfu;l MsfQusV fefuee VkbZe vksoj disoV vkSi vFkZ	N	N	Y ;fn esu& miyC/k ugha dj;k x;k gS vU;Fkk N	Y
¼M- ½	nks Lrj Åij dh oksYVst lqi {kk	Y	Y	N	N
¼p ½	vkWVks fjDyksftax	Y ^{¼,dy} Qsl vkSj rhu Qsl½	Y ^{¼,dy} Qsl vkSj rhu	Y ^{¼,dy} Qsl vkSj rhu Qsl½	Y ^{¼rhu} Qsl½

fVli.kh %

¼1½ Y&okafNr(N&okafNr ugha] vkSj Y/N&,SfPNd

¼2½ fMLVsal izksVsD'ku okys ikjs"k.k ykbZuksa esa lkekU;rk dSfj;j

,MsM baVj fV^afiar vFkok

CykWfdax Qhpj jgsaxs esau&1 vkSj esu&2

ds fy, i'Fkd djsaV V^akalQkeZj dksj rFkkoksYVst V^akalQkeZj dksj

mi;ksx esa fy, tk,axsA

2-

V^akalQkeZj lqlqlqlj {kk&

Øeakd	lqj {kk	765 kv	400kv	220kv r132kv	66kv
¼d½	fMQjsaf'k;y lqj {kk	Y	Y	Y	Y
¼[k½	vksoj ¶ydflex lqj {kk	Y	Y	Y	N
¼x½	jsfLV ^a DVsM vFkZ QkWYV	Y	Y	Y	Y
¼?k½	cSdvi Mk;jsD'kuy vksoj djsaV rFkk vFkZ QkWYV lqj {kk ¼mPnnkc vkSi fuEunkc lkbZM	Y	Y	Y	Y
¼M- ½	Buchholtz WTivkSj OTI (1 MVAvkSj Åij ½] MOGfon yks vkbZy yscy vykeZ] OLTCds fy, vks,lvkj] ihvkjMh] ,l, ckgj V ^a kalQkeZjksa ds fy, izkFkfed vkSj }Sfrf;d nksuks lkbZMksa ij vkSj vksoj	Y	Y	Y	Y
¼p½	Vjljh okabfMax lqj {kk	Y	Y	Y ¼100 MVA jsfVax ds mij½	Y
¼N½	vksoj yksM vykeZ	Y	Y	Y	N

fVli.kh %

¼1½ Y&okafNr

¼2½ WTi&okbafMax rkiØe ladsrd(OTI& vkbZy rkiØe ladsrd(OLTC vFkok

yksM Vsi psatj(PRD& ize's'kj f'fyo fMokbZl(OSR& vkbZy ltZ+ f'fys(MOG&
esXusfVd vkbZy xst(SA<Z+ ,jsLVj

3- f'f;sDVj lqj{kk

Øeak	lqj{kk	765 kv	400 kv
$\frac{1}{4}d\frac{1}{2}$	fMQjsaf'k;y lqj{kk	Y	Y
$\frac{1}{4}[k\frac{1}{2}$	vkjbZ,Q lqj{kk	Y	Y
$\frac{1}{4}x\frac{1}{2}$	f'f;sDVj dh cSdvi lqj{kk $\frac{1}{4}bfEiMsal$ VkbZi vFkok MsfOusV VkbZe vksqi	Y	Y
$\frac{1}{4}k\frac{1}{2}$	Buchholtz, WTI vkSj OTI (1 MVA vkSj Äijds fy, $\frac{1}{2}$] MOGfon yks vkbZy yscy vykeZ] ,l- , $-\frac{1}{4}$;fn vko';d gks $\frac{1}{2}$	Y	Y

fVli.kh %

$\frac{1}{4}l\frac{1}{2}$ Y&okafNr

$\frac{1}{4}2\frac{1}{2}$ WTI& okbafMax rkiØe ladsrd(OTI& vkbZy rkiØe ladsrd(MOG&
esXusfVd vkbZy xst(SA& ltZ+ ,jsLVj

7-14141414 czsdj cSdvi izksVsD'ku

220 dsOgh- vkSj mPprj oksYVst ds varj la;ksftr midsUnzksa ds lkFk&lkFk
IHkh tujsfVax LVs'ku fLop;kMksZ ij cl ckj izksVsD'ku vkSj yksdy czsdj
cSdvi izksVsD'ku miyC/k djkbZ tk,xhA

7-15151515 midsUnz dh vfXu ls izksVsD'ku

Hkkjrh; ekud fofunZs'k vkSj@vFkok dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}fo|qrx`gksa$
rFkk fo|qr ykbZuksa ds fuekZ.k gsrq rduhdh ekun.M $\frac{1}{2}$ fofu;e] 2010 rFkk
dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}lqj\{kk$ vkSj fo|qr iznk; ls lacaf/kr mik; $\frac{1}{2}$ fofu;e]
2010 ds mica/kksa ds vuqlkj jkT;karfjd mi;ksxdrkZx.k vius leLr midj.kksa
dks vfXu ds tksf[ke ls cpkus gsrq vfuok;Zr% leqfpr lqj{kk O;oLFkk djsaxs
rFkk lko/kkuh j[ksaxsA

7-16161616 ifjx.kuk $\frac{1}{4}dsfycsz'$ ku

o"kZ esa ,d ckj vFkok cM+h [kjkch estj QkYV ds rRdky ckn] tks Hkh igys
gks ,l-Vh;-w- izR;sd 400 dsOh] 220 dsOh] 132 dsOh midsUnz ds izksVsD'ku
;kstuk dh vfuok;Zr% tkap djsxkA tujsfVax ;wfuV@dsUnz dh IHkh
izksVsD'ku ;kstukvksa dh lsfVax] leUo;u] ijh{k.k o ifjx.kuk dk nkf;Ro
vfuok;Zr% lacaf/kr dk gSA

7-17171717 laca/kh vko';drk

bl lafgrk ds MkVk iath;u /kkjk $\frac{1}{4}jftLV^a$ s'ku lsD'ku $\frac{1}{2}$ esa mYysf[kr vkadM+s
jkT;karfjd mi;ksxdrkZ vfuok;Zr% jkT; ikjs"k.k miØe $\frac{1}{4}$,l-Vh;-w- $\frac{1}{2}$ dks
miyC/k djxkA

&&000&&

v/;k; & 8

ehVfjax lafgrk

8-1 lkekU; fl)kar%

8-1-1 fxzM lafgrk ds bl Hkkx esa fo|qr ikjs"k.k] ds fofHkUu isjkehVj tSlS fØ;k'khy@izfrfØ;k'khy@izR;{k 'kfDr@mtkZ ikWoj QsDVj] oksYVst] fÝDosalh vkfn ds vadu ¼fjdkfMZax½ rFkk uki dh lqfo/kk tks miyC/k gksuk pkfg;s rFkk dk;Z iz.kkyyh tks viuk;k tkosxk] dks 'kkfey fd;k x;k gSA

8-1-2 ;g lafgrk tujsfVax dsUnz] midSUnz rFkk baVjQsl esa ehVfjax dh vko';drk gsrq dsUnzh; fo|qr izkf/kdj.k ¼ehVjksa dk izfr"Bkiu vkSj lapkyu½ fofu;e] 2006 le;≤ ij ;Fkkla'kksf/kr] esa ;Fkk mYysf[kr eq[; ehVj] psd ehVj] miHkksDrk ¼dUT;wej½ ehVj ¼VsffjQ ehVj½] LVSaM ckbZ ehVj o ,uthZ ,dkmafVax o vkWfMV ehVj] dks lanfHkZr djrk gSA

8-1-3 ;g lafgrk ehVjhax midj.k tSlS ,lksfl,VsM ,lsljht+ ;Fkk] djsaV V^akalQkeZj o oksYVst V^akalQkeZj lfgr ,uthZ ehVj ds ijh{k.k ifjx.kuk rFkk deh'kfuax dh vko';drk izfrikfnr Hkh djrk gSA ;g lafgrk foLrkj ls] MkVk laizs"k.k] VsflVax o dsfycsz'ku iz.kkyyh] o ehVfjax ds fofHkUu rRoksa ds rduhdh QhplZ dks] [kjc rFkk can ehVj dh n'kk esa mi;ksx ds vkadyu ds fy, izfØ;k rFkk fofHkUu vfHkdj.kksa ds e/; fookn lqy>kus ds fy, ekxZn'kZu Hkh fofufnZ"V djrk gSA

8-1-4 vkSiU ,Dlsl miHkksDrk dks fo|qr vkiwfrZ djus okys tujsfVax la;a= ,chVh Ldhe ds vuqlkj ehVjhax djsxk rFkk nksuks Nksj vFkkZr batsD'ku ikWbZUV rFkk M^akWy ikbZUV esa ,chVh ehVIZ yxk;s tkosaxsA

8-1-5 ;fn vkSiU ,Dlsl xzkgd@miHkksDrk@jkT;karfjd mi;ksxdrkZ ehVj iznk; djrs gSa rks ykbZlsalh ds fcfyax gsrq rFkk izpkYu ds fy, lk¶Vos;j rFkk oh&lsV vFkok yht ykbZu ds ek/;e ls okLrfod VkbZe MkVk ds varj.k ds fy, ,l-,y-Mh-lh- dks lapkj lqfo/kk miyC/k djruk gksxkA

8-2 lanHkZ ekud%

8-2-1 ehVj rFkk lac) midj.k ds lanHkZ esa fuEufyf[kr Hkkjrh; ekud ¼;Fkk v|ru la'kksf/kr½ iz;ksT; gksaxs %&

Øekd	ekud	ekud 'kh"kZ
¼i½	vkbZ,l 13779	,lh-LVsfVd okWV ?kaVs ehVj QkWj
	vkbZ,l 14697	,lh-LVsfVd V ^a kalQkeZj vkijVsM okWV ?kaVs rFkk Oggh-,-vki ?kaVs djsV V ^a kWlQkeZj gsrq Hkkjrh; ekud
	vkbZ,l 2705	OgksYVst V ^a kWlQkeZj gsrq Hkkjrh;
	vkbZ,l 3156	OgksYVst V ^a kWlQkeZj gsrq Hkkjrh;
	vkbZ,l 9348	dflyax dSisflVj o dSisflVj fMokbMj gsrq Hkkirh; ekud
	vkbZ,l 5547	dSisflVj OgksYVst V ^a kWlQkeZj gsrq
¼ii½	lhchvkbZih rduhdh	,lh-LVsfVd bysfDV ^a dy buthZ ehVj gsrq fofunsZ'k
¼iii½	lhchvkbZih rduhdh fiiksVZ&111	dkWeu ehVj jhfMax midj.k gsrq fofunsZ'k
¼iv½	vkbZ,l 9000	bysDV ^a kWfud o fo qr vk;Ve gsrq ewvHkwr i;kZoi.k VsflVax izfØ;kA
¼v½	vkbZ,l 12063	izksVsD'kufMxzh ds oxhZdj.k gsrq

8-2-2 fuEufyf[kr varjkZ"V^ah; ekud $\frac{1}{4}$;Fkk v|ru la'kksf/kr $\frac{1}{2}$] ehVj o lac) midj.k tks Hkkjrh; ekud dk vuqiky ugha djrs rFkk Hkkjr esa ftldk mRiknu ugha gksrk] iz;ksT; gksaxsA

Øeka	ekud uacj	ekud 'kh"kZ
$\frac{1}{4}i\frac{1}{2}$	vkbZ-bZ-lh-687	fØ;k'khy buthZ gsrq ,lh-LVsfVd okWV ?kaVs ehVi ds fv. fofunsZ'k $\frac{1}{4}oxZ$ 0-2 .1
$\frac{1}{4}ii\frac{1}{2}$	vkbZ-bZ-lh-1036	fØ;k'khy buthZ gsrq ,lh-LVsfVd okWV ?kaVs ehVi ds fv. fofunsZ'k $\frac{1}{4}oxZ$ 1 o 2 $\frac{1}{2}$
$\frac{1}{4}iii\frac{1}{2}$	vkbZ-bZ-lh-1268	izfrfØ;k'khy buthZ gsrq ,lh-LVsfVd okWV ?kaVs ehVi ds fv. fofunsZ'k

8-3 ehVfjax fBdkuksa ij miyC/k

jkT;karfjd mi;ksxdrkZ tgka dgha iz;ksT; gks] ehVjksa rFkk lac) midj.kksa ds izfr"Bkiu dks mi;qDr cukus ds fy, vko';d LFkku miyC/k dj,axsA

8-4 dh iz;ksT;rk $\frac{1}{4}$ LokfeRo vkSj LFkku $\frac{1}{2}$

ehVj dk LokfeRo vkSj LFkku fuEukuqlkj jgsxk %&

8-4-1 $\frac{1}{4},\frac{1}{2}$ fo|qr dh x.kuk vkSj fcfyax ds mn~ns'; ls varj jkT;h; ikjs"k.k iz.kkyh ds leLr varj la;ksstu fcUnqvksa ij izfr"Bkfir baVjQsl ehVj] dsUnzh; ikjs"k.k miØe ds LokfeRo esa jgsaxs(

$\frac{1}{4}ch\frac{1}{2}$ fo|qr dh x.kuk vkSj fcfyax ds mn~ns'; ls mi;qZDr mi vuqPNsn $\frac{1}{4}d\frac{1}{2}$ varxZr iz.kkyh dks NksM+dj jkT;karfjd ikjs"k.k iz.kkyh ds varj la;ksstu fcUnqvksa ij izfr"Bkfir leLr baVjQsl ehVj] jkT; ikjs"k.k miØe ds LokfeRo esa jgsaxsA ehVj dk ewY; jkT;karfjd mi;ksxdrkvksa }kjk ogu fd;k tk,xkA

$\frac{1}{4}lh\frac{1}{2}$ fo|qr dh x.kuk vkSj fcfyax ds mn~ns'; ls mi;qZDr mi vuqPNsn $\frac{1}{4}d\frac{1}{2}$ vkSj $\frac{1}{4}[k\frac{1}{2}]$ ds varxZr iz.kkfy;ksa dks NksM+dj nks vuqKflr/kkfj;kas ds varj la;ksstu fcUnqvksa ij izfr"Bkfir leLr baVjQsl ehVj] lacaf/kr vuqKflr/kkjh ds LokfeRo esa jgsaxsA ehVj dk ewY; lacaf/kr vuqKflr/kkfj;ksa }kjk ogu fd;k tk,xkA

$\frac{1}{4}Mh\frac{1}{2}$ fo|qr dh x.kuk vkSj fcfyax ds mn~ns'; ls varj la;ksstu fcUnqvksa ij izfr"Bkfir leLr baVjQsl ehVj tks mi;qZDr mi vuqPNsn $\frac{1}{4}d\frac{1}{2}[\frac{1}{4}[k\frac{1}{2}]$ vkSj $\frac{1}{4}x\frac{1}{2}$ ds varxZr ugha vkrs tSls vksi, Dls miHkksDrkvksa ds ifjlksa esa] dk LokfeRo fo|qr ds iznk;drkZ vFkkZr vuqKflr/kkjh dk jgsxkA ehVj dk ewY; vksi, Dls miHkksDrk }kjk ogu fd;k tk,xkA

$\frac{1}{4}bZ-\frac{1}{2}$ vfr mPpnkc oksYVst miHkksDrkvksa ds fy, tks lh/ks ikjs"k.k iz.kkyh ls la;ksftr gSa] miHkksDrk ds ifjlksa esa ehVfjax] ÅtkZ dh x.kuk rFkk fcfyax NRrhlx<+ jkT; fo|qr iznk; lafgrk ds izko/kkuksa ds vuqlkj jgsaxsA

mRiknu la;a= $\frac{1}{4}$ tujsfVax IykaVl

xSj ikjaifjd lzksrksa ij vk/kkfjr ÅtkZ mRiknu la;a=ksa lfgr izR;sd mRiknu la;a=ksa ds fy,] pkgs os jkT;karfjd ikjs"k.k iz.kkyh ls izR;{k :i ls vFkok jkT;

ikjs"k.k miØe ds vykok fdlh vU; iz.kkyh ds ek;/e ls la;ksftr gksa izR;sd tujsVj VfeZuy] ,pOgh lkbZM vkWQ tujsVj LVsi vi V^akWalQkeZj $\frac{1}{4}$ LVSaM ckbZ ehVj $\frac{1}{2}$] ;qfuV vkDthyjh V^akWalQkeZj $\frac{1}{4}$;w,Vh $\frac{1}{2}$] LVs'ku V^akUlQkeZj ds-,l-Ogh- lkbM ij ehVj yxkuk gksxk] rFkk fxzM esa ikWoj dsUnz }kjk buthZ tujsV djus rFkk fMyhoj djus tujsfVax la;a= esa lHkh vkmV xksbax QhMj ij yxkus gksaxsA

8-4-3 jkT; ikjs"k.k miØe &forj.k vuqKflr/kkjhs ds e/; ehVfjax&

jkT; ikjs"k.k miØe }kjk forj.k vuqKflr/kkjhs $\frac{1}{4}$ LVs'ku V^akWalQkeZj dks NksM+dj $\frac{1}{2}$] dks ikWoj forj.k ds eki ds fy,] mi dsUnz esa LFkkfir b,pOgh IkWoj V^akWalQkeZj ds ,y Ogh lkbM vFkkZr 132@33 ds 33 dsOgh lkbM rFkk 132@11 dsOgh ds 11 dsOgh lkbM ij esa ehVfjax LFkkfir djuk gksxkA ,dkf/kd forj.k vuqKflr/kkjhs dh n'kk esa ÅtkZ dh x.kuk djus okys ehVj leLr ckgj tkus okys $\frac{1}{4}$ vkmV xksfoax $\frac{1}{2}$ 33 dsOgh RkFkk 11 dsOgh QhMjksa ij miyC/k dj,k,a tk,axs vkSj b,pOgh ikWoj V^akWalQkeZj ds ,y Ogh lkbM ij yxkbZ xbZ vkfMV ehVj ls ,uthZ ds fjdfU'kfy;s'ku fd;k tk,xkA

dsUnz lgk;d miHkksx $\frac{1}{4}$ vkDthyjh

jkT; ikjs"k.k miØe midsUnz ds lgk;d mi;ksx dh [kir LVs'ku V^akWlQkeZj ds ,y Ogh lkbM ij fjdkZM fd;k tkuk pkfg,] ;fn ,slk V^akWlQkeZj LVs'ku yksM ds vfrfjDr vU; LFkkuh; yksM $\frac{1}{4}$ dkyksuh DokWVZj] LV^ahV ykbV vkfn $\frac{1}{2}$ dks Hkh fo|qr iznk; QhM djrk gks rks vyx&vyx QhMj gsrq vyx&vyx ehVj dh O;oLFkk dh tkuk pkfg,A

ehVfjax $\frac{1}{4}$ vkWijs'kuy feVfjax $\frac{1}{2}$

VSfjQ ehVfjax dks NksMdj vU; iz;kstu ds fy, tgka dgaha Hkh jkT; ikjs"k.k miØe@tujsfVax dEiuh }kjk ;qfDr;qDr visf{kr gks] izpkyu ehVfjax dh tkuk pkfg,A jkT; ikjs"k.k miØe }kjk izpkyu vko';drk ij vk/kkfjr ekinaM o vU; vko';drk dks vafre :i fn;k tkuk pkfg,A

8-5 ehVfjax iz.kkyh dk lapkyu ,oa la/kkj.k&

ehVj ds lapkyu o la/kkj.k dk nkf;Ro iw.kZr% ehVj ds ekfyd dk gksxk ftlesa ehVfjax fLVe dh leqfpr LFkkiuk] ehVfjax iz.kkyh dh fu;fer ns[kHkky] lh-Vh] Ogh-Vh- rFkk ehVj ds =qfV;ksa dh tkWap] dscy dks leqfpr :i ls fcNkuk rFkk mldh lqj{kk] dusD'ku@tksM+ dh lQkbZ] lh-Vh-] Ogh-Vh- ehVj yHM esa OgksYVst M^aki dh tkWp] ehVj ckDl o ,uDykstj o lhy dh fLFkfr] fu;fer@nSfud jhfMax ehVj rFkk dkWeu ehVfjax jhfMax bLVwesaV $\frac{1}{4}$ lh-,e-vkj-vkbZ- $\frac{1}{2}$ ds }kjk jsX;wyj MkVk fjV^akbo rFkk MkVk izkslsflax iz.kkyh $\frac{1}{4}$ Mh-ih-,l- $\frac{1}{2}$ rFkk ehVfjax iz.kkyh vkfn ij fdlh Hkh czsd Mkmu@[kjkch 'kkfey gSaA

8-6 ,uthZ ehVj gsrq U;wure rduhdh vko';drk,a%&

8-6-1 ekiu ,yhesaV % ehVfjax ifjx.kuk $\frac{1}{4}$,D;wjslh $\frac{1}{2}$ rFkk vU; vfuok;Z ekinaMksa dks izHkkfor fd;s fcuk ehVj 3 Qsl 4 ok;j] ds Qqy pkj DokM^asUV Vbki

LVsfVd V^akb&osDVj ehVj $\frac{1}{4}$ Vh-Ogh-,e- $\frac{1}{2}$ gksaxs] fls 3 Qsl 3 ok;j iz.kkyh vFkok 2 Qsl 2 ok;j iz.kkyh $\frac{1}{4}$ V^asD'ku ,lyhds'ku $\frac{1}{2}$ ds gksaxsA

8-6-2 ,slh n'kk esa tdkWa dsifVo ikWoj tujsVjksa@miHkksDrkvksa }kjk mlh la;kstdrk@ykbZu ls fofHkUu ek=k dh ÅtkZ vko';drkvksa ds vuqlkj vk;kr vkSj fu;kZr dh vko';drk gksrh gS ogkW vuqKflr/kkj }kjk ehVfjax iz.kkyh dh i;kZIr vkSj i;kZIr ifj'kq)rk lqfuf'pr djuk pkfg,A

8-6-3 ckg~; :i ls tqMs+ lh-Vh- o Ogh-Vh- ds vuqikr $\frac{1}{4}$ js';ks $\frac{1}{2}$ =qfV rFkk Qsl ,saxy =qfV dks Bhd djus dh lqfo/kk , -ch-Vh- ehVj esa gksuh pkfg,A

8-6-4 ehVj dks fo|qr ds QaMkeasVy vkj-,e-,l- ewY; ,oa gkeksZfuDl dks ekiuk pkfg,A

8-6-5 $\frac{1}{4}$ larqfyr o vlarqfyr yksM ds fy, $\frac{1}{2}$ vkijsfVax iz.kkyh ekunaM+ %

$\frac{1}{4}$, $\frac{1}{2}$ vkijsfVax oksYVst jsat %& -20% ls +15% ds osfj;s'ku jsat lfgr 110 oksYV~l , - lh- $\frac{1}{4}$ ykb&ykb $\frac{1}{2}$ ij ehVj dks larks"ktud dk;Z djuk pkfg,A

$\frac{1}{4}$ ch $\frac{1}{2}$ vkijsfVax fYDosalh jsat %& -5%ls +5% ds osfj;s'ku jsat lfgr 50 gV~Zt ij ehVj dks larks"ktud dk;Z djuk pkfg,A

$\frac{1}{4}$ lh $\frac{1}{2}$ vkijsfVax ikWoj QsDVj % 0 ySx ls ;wfuVh ls 0 yhM rd ds ikWoj QsDVj jsat ij ehVj dks larks"ktud dk;Z djuk pkfg,A

8-6-6 fu/kkZfjr ukfeuy djsaV rFkk fu/kkZfjr vf/kdre djsaV& ehVj dks lh-Vh- ldsUMjh lfdZV ls 1 ,Eih;j vFkok 5 ,Eih;j ij dke djuk pkfg,A ukefuy djsaV ds 120 izfr'kr ls vf/kd fu/kkZfjr ldsUMjh djsaV dnkfi ugha gksuk pkfg,A

8-6-7 fu/kkZfjr 'kkVZ Vkbe djsaV % 0-5 ldsUM ds fy, ehVj dks fu/kkZfjr ukfeuy djsaV ds 20 xquk rd lgu djus dh {kerk gksuh pkfg,A

8-6-8 U;wure LVkZfVax djsaV % ;wfuVh ikWoj QsDVj ij ukfeuy djsaV ds 0-1 izfr'kr ds cjkcj U;wure LVkZfVax djsaV ij ehVj dk izpkyu rFkk vadu izkjaHk djuk pkfg,A

rFkk ikWoj miHkksx % ehVfjax iz.kkyh dk Hkkj djsaV lfdZV ij 1 okV ls vf/kd rFkk oksYVst lfdZV ij 8 oksYV ,fEi;j ls vf/kd dnkfi ugha gksuk pkfg,] rkfd Ogh-Vh- rFkk lh-Vh- yhM esa vf/kd oksYVst M^akWi u gksA

8-6-10101010 ,sD;wjslh

ehVj }kjk ,sD;wjslh Js.kh ds fuEufyf[kr okaNkvksa dh iwfrZ dh tk,xh $\frac{1}{4}$ mYysf[kr ,sD;wjslh Js.kh ls mPprj Lohdk;Z gksxh $\frac{1}{2}$ %

baVjQsl	0-2,1	
miHkksDrk ehVj	11KVvkSj 33 KV	0-5,1 vFkok csgrj
ÅtkZ x.kuk rFkk vads{k.k ehVj	33 KVds Åij 0-2,1 vFkok csgrj ehVjks dh ifj'kq)rk Js.kh] tujVj LVVj vkSj ;wfuV vkfDtyjh V ^a klQkejksa d Vi l ,l ifj'kq)rk J.kh l fuEurj ugh gkxhA j dh ifj'kq)rk 1-0 ,l ls fuEurj ugh	

	$\frac{1}{4}2\frac{1}{2}$ ikjs" k.k iz.kkyh esa ehVjksa dh ifj'kq)rkJs.kh 0-2 ,l ifj'kq)rk Js.kh ls fuEurj ugha gksxhA $\frac{1}{4}3\frac{1}{2}$ forj.k iz.kkyh esa ehVjksa dh ifj'kq)rk Js.kh 0-5 Li f'kq)rk Js.kh ls fuEurj ugha gksxhA
--	---

$\frac{1}{4}$ lanHkZ& dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ ehVjksa dk izfr"Bkiu vkSj lapkyu $\frac{1}{2}$ fofu;e] 2006 le;≤ ij ;Fkk la'kksf/kr $\frac{1}{2}$

8-6-11111111 Hkw;kstu $\frac{1}{4}$

ehVfjax iz.kkyh lkWfyMyh vFkZ ikWoj iz.kkyh ds fy, mi;qDr gksuh pkfg,A

8-6-12121212 ehVj ckWDl&

ehVj ckDl ds izksVsD'ku Lrj dks vkbZ-,l- 12063 esa nf'kZr vkbZ-ih-&51 ls de dnkfi ugha gksuk pkfg,] rFkk mls buMksj] vokrkuqdwfyr LFkkiuk esa larks"ktud izpkYu ds fy, l{ke Hkh gksuk pkfg,A

8-6-13131313 LFkkiu ,oa ekmfUVax %

ehVj buMksj vFkok vkmVMksj ,Iyhds'ku LFkkfir djus ds fy, mi;qDr gksuk pkfg,A tgka lh-Vh- o Ogh-Vh- ehVj ds vo;o gksa] ehVj midj.k V^akalQkeZj ds ftruk ikl gks lds yxkuk pkfg, rkfd lsdaMjh yhM esa de OgksYVst M^aki gks ldsA ehVj dks U;wure vkbZ-ih-&31 ekud ds vuq:i /kwy jfgr] rkyk yxkus ;ksX; rFkk VsEij izwQ iSuy vFkok jSd vFkok eSVy ckDl esa LFkkfir fd;k tkuk pkfg,A

ehVj dks gVk, ;k fudky fy, tkus dh fLFkfr ds fy, ehVfjax iz.kkyh esa lh-Vh-'kkfVZax dh lqfo/kk Hkh gksuk pkfg,A

s dh {kerk,a & rkRdkfyd MkVk

ehVj dks de ls de fuEufyf[kr tkudkfj;ka $\frac{1}{4}$ ekaxus ij $\frac{1}{2}$ vafdr djus rFkk iznf'kZr djus esa leFkZ gksuk pkfg, %

$\frac{1}{4},\frac{1}{2}$ rhu vkj-,e-,l- ykbu OgksYVst

$\frac{1}{4}$ ch $\frac{1}{2}$ rhu vkj-,e-,l- ykbu djsaV

$\frac{1}{4}$ lh $\frac{1}{2}$ iz.kkyh fYDosUlh $\frac{1}{4}$ gV~Zt $\frac{1}{2}$

$\frac{1}{4}$ Mh $\frac{1}{2}$ ySx@yhM ds izrhd lfgr ikWoj QsDVj

$\frac{1}{4}$ bZ $\frac{1}{2}$ okWV&vk;kr

$\frac{1}{4},Q\frac{1}{2}$ okWV&fu;kZr

$\frac{1}{4}$ th $\frac{1}{2}$ Ogh-,vkj-&yhM

$\frac{1}{4},p\frac{1}{2}$ Ogh-,vkj-&ySx

$\frac{1}{4}$ vkbZ $\frac{1}{2}$ Ogh-,& vk;kr

$\frac{1}{4}$ th $\frac{1}{2}$

Ogh-,& fu;kZr $\frac{1}{4}$ ds $\frac{1}{2}$ ekg ds nkSjku vf/kdre ekax $\frac{1}{4}$ vk;kr $\frac{1}{2}$ frfFk o le; lfgr okWV vkSj Ogh-, esa

$\frac{1}{4},y\frac{1}{2}$ ekg ds nkSjku vf/kdre ekax $\frac{1}{4}$ fu;kZr $\frac{1}{2}$ frfFk o le; lfgr okWV vkSj

Ogh-, esa $\frac{1}{4},e\frac{1}{2}$ ehVj ljj Øekad

{kerk,a & lafpr MkVk %

ehVj esa de ls de fuEufyf[kr lafpr tkudkfj;ksa dks $\frac{1}{4}$ ekax ij $\frac{1}{2}$ fjdkMZ djus]

laxzg.k djus rFkk izn'kZu djus esa l{ke@leFkZ gksuk pkfg,A izR;sd tkudkj
ds fy, de ls de 5 iath $\frac{1}{4}$ ftLVj $\frac{1}{2}$ miyC/k gksuk pkfg,] 1 iath fnu ds pkSchl
?kaVksa ds ,uthZ fjdkMZ djsxk tcfvU; 4 iath ekfuZax ihd] ekfuZax
vkQ&ihd] bOgfuax ihd rFkk bOgfuax vkQ&ihd vof/k dks fnu ds le; $\frac{1}{4}$ Vh-
vks-Mh- $\frac{1}{2}$ ds ,uthZ dks vafdr djsxk%&

$\frac{1}{4},\frac{1}{2}$ okWV ?kaVk& vk;kr

$\frac{1}{4}$ ch $\frac{1}{2}$ okWV ?kaVk& fu;kZr

$\frac{1}{4}$ lh $\frac{1}{2}$ Ogh,-,vkj ?kaVk&yhM Ogkby okWV ?kaVk& vk;kr

$\frac{1}{4}$ Mh $\frac{1}{2}$ Ogh,-,vkj ?kaVk&ySx Ogkby okWV ?kaVk& vk;kr

$\frac{1}{4}$ bZ $\frac{1}{2}$ Ogh,-,vkj ?kaVk&yhM Ogkby okWV ?kaVk& fu;kZr

$\frac{1}{4},Q\frac{1}{2}$ Ogh,-,vkj ?kaVk&ySx Ogkby okWV ?kaVk& fu;kZr

$\frac{1}{4}$ th $\frac{1}{2}$ Ogh,-,?kaVk& vk;kr

$\frac{1}{4},p\frac{1}{2}$ Ogh,-,?kaVk& fu;kZr

$\frac{1}{4}$ vkBZ $\frac{1}{2}$ Ogh,-,vkj ?kaVk fuEu OgksYVst ds nkSjku $\frac{1}{4}$ 97 izfr'kr ls de
oksYVst $\frac{1}{2}$ *

$\frac{1}{4}$ ts $\frac{1}{2}$ Ogh,-,vkj ?kaVk mPp oksYVst ds nkSjku $\frac{1}{4}$ 103 izfr'kr ls vf/kd
oksYVst $\frac{1}{2}$ *

* ;s ekunaM dsoy miyC/krk vk/kkfjr VSfjQ $\frac{1}{4}$,-ch-Vh $\frac{1}{2}$ mn~ns'; ds fy,
gh gSa] vr% Vh- vksMh-iath dh dksbZ vko';drk ugha gSA

MkVk ykfxax dh {kerk,a 1 & ,dhd'r MkVk

15 $\frac{1}{4}$ ianzg $\frac{1}{2}$ feuV ds ykfxax varjky esa U;wure 40 $\frac{1}{4}$ pkyl $\frac{1}{2}$ fnu ds fy,
dafMdk 8-6-14 o 8-6-15 esa ls de ls de 10 $\frac{1}{4}$ nl $\frac{1}{2}$ lwphc) tkudkfj;ksa ds fdllh
Hkh la;kstu dks Hk.Mkj.k djus gsrq ehVj esa i;kZIr Lej.k $\frac{1}{4}$ eseksjh $\frac{1}{2}$ {kerk
gksuh pkfg;sA jkT; V^akaleh'ku ;wfVyhVh] lh-,e-vkj-vkBZ- rFkk@vFkok
fjeksVyh mi;ksx djrs gq, vkfIVdy iksVZ ds ek;/e ls bu tkudkfj;ksa dks
LFkkuh; :i ls p;u $\frac{1}{4}$ lsysDV $\frac{1}{2}$ djus dks l{ke@leFkZ gksuk pkfg;sA 15 feuV ds
varjky ls de ls de fuEufyf[kr vfuok;Z tkudkfj;ksa dks ykWx fd;k tkuk
pkfg;s%

$\frac{1}{4},\frac{1}{2}$ okWV & vk;kr

$\frac{1}{4}$ ch $\frac{1}{2}$ okWV & fu;kZr

$\frac{1}{4}$ lh $\frac{1}{2}$ oh,vkj&yhM OgkbZy okWV&vk;kr

$\frac{1}{4}$ Mh $\frac{1}{2}$ oh,vkj&ysx OgkbZy okWV&vk;kr

$\frac{1}{4}$ bZ $\frac{1}{2}$ oh,vkj&yhM OgkbZy okWV&fu;kZr

$\frac{1}{4},Q\frac{1}{2}$ oh,vkj&ysx OgkbZy okWV&fu;kZr

$\frac{1}{4}$ th $\frac{1}{2}$ oh,vkj ?kaVk fuEu oksYVst ds nkSjku $\frac{1}{4}$ 97% ls de oksYVst $\frac{1}{2}$

$\frac{1}{4},p\frac{1}{2}$ oh,vkj ?kaVk mPp oksYVst ds nkSjku $\frac{1}{4}$ 103% ls vf/kd oksYVst $\frac{1}{2}$

$\frac{1}{4}$ vkBZ $\frac{1}{2}$ vkSlr fQzDosalh $\frac{1}{4}$ gVZt $\frac{1}{2}$

$\frac{1}{4}$ ts $\frac{1}{2}$ vkSlr rhu Qst oksYVst

vkij's'kuy ehVjhax dh n'kk esa] tkudkfj;ksa dh la[;k rFkk mudk ykfxax varjky
muds izpkkyu vko';drk ds vuqlkj vuqKflr/kkj}kjk r; gksaxsA

8-6-17171717 vU;

de ls de 12 $\frac{1}{4}$ ckjg $\frac{1}{2}$ eghusa dh vof/k ds fy, ekg ds vafre fnu 24 osa ?kaVs esa
vafdr $\frac{1}{4}$ fjdkMZsM $\frac{1}{2}$ lfØ; ,uthZ $\frac{1}{4}$ vk;kr $\frac{1}{2}$] lfØ; ,uthZ $\frac{1}{4}$ fu;kZr $\frac{1}{2}$] izfrfØ;k'khy
,uthZ $\frac{1}{4}$ ysx $\frac{1}{2}$ rFkk izfrfØ;k'khy ,uthZ $\frac{1}{4}$ yhM $\frac{1}{2}$ vyx&vyx lfØ; ,uthZ $\frac{1}{4}$ vk;kr $\frac{1}{2}$
o lfØ; $\frac{1}{4}$ fu;kZr $\frac{1}{2}$ n'kkvksa esa vafdr ewY; dks Hk.Mkj.k djus esa izR;sd ehVj
dks l{ke@leFkZ gksuk pkfg;sA jkT;karfjd mi;ksxdrkZ og le; o frfFk
izksxzke djus l{ke gksuk pkfg;s] ftl ij eseksjh esa ,uthZ ds osY;w dks
HkaMkfjr $\frac{1}{4}$ LVksj $\frac{1}{2}$ fd;k tkuk gksA

8-6-18181818 bosUV rFkk vlkekU;rkvksa dh ykfxax {kerk %

de ls de 1 $\frac{1}{4}$,d $\frac{1}{2}$ lsd.M ds fjtqyq'ku esa frfFk o le; lfgr ?kVuk dks ykx djus
esa ehVj dks l{ke gksuk pkfg;sA dEikVZesaV okj] QLVZ bu QLVZ vkmV
 $\frac{1}{4}$,Q-vkbZ-,Q-vks- $\frac{1}{2}$ iz.kkyh ij vk/kkfjr ehVj esa de ls de 100 ?kVukvksa
 $\frac{1}{4}$ bosUV $\frac{1}{2}$ dks LVksj djus dh ijUrq fuEufyf[kr rd lhfer ugha] i;kZIr eseksjh
{kerk gksuh pkfg;s %&

$\frac{1}{4}$, $\frac{1}{2}$ feflax iksVsfUl;y $\frac{1}{4}$ ohVh LklykbZ feflax $\frac{1}{2}$

$\frac{1}{4}$ ch $\frac{1}{2}$ lhVh@ohVh iksyjhVh ffolZy

$\frac{1}{4}$ lh $\frac{1}{2}$ fdll ,d Qst vFkok ,d Qst ls vf/kd esa djsaV vucysalst $\frac{1}{4}$ esfXuV~;wM o
Qst vucsysal $\frac{1}{2}$

$\frac{1}{4}$ Mh $\frac{1}{2}$ fdll ,d Qst vFkok ,d ls vf/kd Qst esa oksYVst vucysalst
 $\frac{1}{4}$ esfXuV~;wM o Qst vucsysal $\frac{1}{2}$

$\frac{1}{4}$ bZ $\frac{1}{2}$ izR;sd ck/kk dh vof/k lfgr vkiwfrZ ck/kk $\frac{1}{4}$ buVjI'ku $\frac{1}{2}$

$\frac{1}{4}$,Q $\frac{1}{2}$ VsEij lwpuk@,ukWeyh vkdjsUl@,ukWeyh cgkyhA

$\frac{1}{4}$ th $\frac{1}{2}$ ehVj vkarfjd lsV&vi@izksxzke psUt lwpukA

fjvy VkbZe Dykd $\frac{1}{4}$ vkjVhlh $\frac{1}{2}$ rFkk dys.Mj&

ehVj esa bu fcYV DokVZ~t fØLVy ij vk/kkfjr ,D;wjsV fjvy VkbZe Dykd
gksuk pkfg,A 24 ?kaVs ds QkjesV $\frac{1}{4}$?kaVk%feuV%lsdaM $\frac{1}{2}$ esa ehVj dks
fjvy VkbZe iznf'kZr djuk pkfg;sA

fnukad&ekg&o"KZ ds QkesZV esa Hkkjrh; dys.Mj ds vuqlkj frfFk dk

izn'kZu Hkh ehVj esa gksuk pkfg;sA ehVj esa 30 $\frac{1}{4}$ rhl $\frac{1}{2}$ o"khZ; dys.Mj

vkVksesfVd yhi bZvj ,MtLVesaV lfgr gksuk pkfg;sA

dys.Mj vkSj ?kM+h dh fo'oluh;rk ,d feuV izfro"KZ ;k mlls Hkh vPNk gksuh
pkfg;sA

8-6-20202020 le; flaØksukbZts'ku

Xykscy iksth'kuhax iz.kkyh $\frac{1}{4}$ th-ih-,l- $\frac{1}{2}$ vFkok dsUnzh; dEI;wVj $\frac{1}{4}$ lh-Mh-lh-
lh- $\frac{1}{2}$ ds ek;/e ls fjeksV MkVk lapkj ds fy, mlh iksVZ ds mi;ksx lfgr] lHkh

ehVjksa esa le; fladzksukbZts'ku dh LFkkuh; rFkk@vFkok fjeksVyh lqfo/kk
gksuh pkfg;sA

8-6-21212121 MkVk fjVsa'ku

fcuk fdlh csVjh csdvi ds U;wure $10\frac{1}{4}nl\frac{1}{2}$ o"khZ; fjVsa'ku vof/k lfgr ehVj esa
ukWu&oksysVkbZy eseksjh esa ykXM MkVk laxzg.k djus dh {kerk gksuh
pkfg;sA

MkVk daLkaVs^a'ku rFkk usVodZ baVhxsZ'ku&

midsUnz esa yxs lHkh ehVj dk yksdy usVodZ] ekMse@efYVIysDlj@MkVk
dalaVs^aVj@ysu gc Lohp dk mi;ksx djrs gq, fufeZr djuk pkfg;sA bl yksdy
usVodZ dks mi;qDr ekud izksVksdky dk mi;ksx djrs gq, lapkj usVodZ ls
,dhd`r gksuk pkfg;sA

jsfM;ks fQzDosalh] ekbZØksoso] ifCyd LohPM VsFYQksu usVodZ $\frac{1}{4}ih$ -,l-
Vh-,u- $\frac{1}{2}$] ikoj ykbZu dsfj;j lapkj $\frac{1}{4}ih$ -,y-lh-lh- $\frac{1}{2}$] osjh Leky visjpp VfeZuy
 $\frac{1}{4}oh$ -,l-,Vh- $\frac{1}{2}$ usVodZ] vkfIVdy QkbZcj dscy $\frac{1}{4}vks$ -,Q-lh- $\frac{1}{2}$] th,l,e] jsfM;ks
vFkok fdlh vU; VsfyehVjh lk/ku ij Hkh lapkj usVodZ vk/kkfjr gks ldrk gSA

8-6-23232323 IkYl vkmViqV

MCyw,p o oh,vkj,p eki dk ,D;wjslh psd rFkk VsLV dsfyecz'ku ds fy, ehVj ds
lkeus mPp rhozrk $\frac{1}{4}baVsulhVh\frac{1}{2}$ ds ykbZV ,feVhax Mk;ksM~l $\frac{1}{4}$,ybZMh $\frac{1}{2}$
gksuk pkfg;sA

8-6-24242424 fMLIys

czkbZV csd ykbZV o vkVksesfVd csd ykbZV VkbZe vkmV Qhpj lfgr ehVj
esa U;wure 7 fMthV~l vYQk U;wesfjd fyfDoM fØLVy fMLIys $\frac{1}{4}$,ylhMh $\frac{1}{2}$
vFkok ykbZV ,feVhax Mk;ksM $\frac{1}{4}$,ybZMh $\frac{1}{2}$ VkbZi fMLIys gksuk pkfg;sA
fMLIys dks Lohp vkWu djus rFkk ,d baMhds'ku ls nwljs baMhds'ku esa
cnyus ds fy, ehVj QzaV ij Vp dh isM vFkok iq'k cVu gksuk pkfg;sA vyx vyx
nks iq'k cVu LØkfyax rFkk ,eMh fjlsfVax ds fy, Hkh gksuk pkfg;sA

8-6-25252525 MkVk lsD;wfjVh

$\frac{1}{4}$, $\frac{1}{2}$ MkVk ,ufØI'ku $\frac{1}{4}dksfMax\frac{1}{2}$ {kerk

$\frac{1}{4}ch\frac{1}{2}$ esdsfudy lhYk rFkk ykWd vFkkZr lhfyax izksfOgtu Qkj
VfeZuy CykWd] ehVj dOgj] ,eMh fjlsV izhfMQkbZUM MsV ,oa VkbZe
vFkok lh,evkjbkbZ o lHkh lapkj iksVZ~lA

$\frac{1}{4}lh\frac{1}{2}$ eslst vkFksfUVds'ku ,YxksfjFke {kerk@eYVhysoy ikloMZ
izksVsD'ku

$\frac{1}{4}Mh\frac{1}{2}$ bafMisaMsaV lsD;wjhVh ,Økl lapkj psuYl

8-6-26262626 lsYQ Mk;XuksfLVd Qhpj

vkarfjr vo;o $\frac{1}{4}baVjuy$ dEiksusaV $\frac{1}{2}$ rFkk lfdZV^ah ds lgh gksus dks Ldsu djus
ehVj esa lsYQ Mk;XuksfLVd Qhpj gksuk pkfg;sA fdlh vlkekU; ?kVuk
vFkok =qfV dk irk yxus ij ehVj }kjk vfoyac eslst fMLIys djuk pkfg;sA

8-6-27272727 lapkj iksVZ~l

de ls de fuEufyf[kr lapkj iksVZ~l ehVj esa gksuk pkfg, %&

$\frac{1}{4}, \frac{1}{2}$ vkbZbZlh 1107 ds vuqlkj LFkkuh; lapkj ds fy, ,d vkfIVdyh
vkbZlksysVsM bUQzkjsV lapkj iksVZ $\frac{1}{4}$ vkfIVdy iksVZ $\frac{1}{2}$
 $\frac{1}{4}$ ch $\frac{1}{2}$ fjeksV lapkj gsrq ,d xsYofudyh vkbZlksysM bZFkjusV $\frac{1}{4}, y, u, \frac{1}{2}$
iksVZ vFkok vkj, 1485 fljhvy iksVZ vFkok vkj, 1232 fljhvy iksVZA

8-6-28282828 lapkj dk izksVksdky

ckg~; ra= ls lapkj ds fy, ehVj llyk;j dks ehVj esa vksiu izksVksdky tSls ,e-
vks-Mh-ch-;w-,l- vkj-Vh-;w-,l-] ,e-vk-sMh-ch-;w-,l-] Vh-lh-ih-@vkbZ-ih-]
vkbZ-bZ-lh- 870&5&102] vkbZ-bZ-bZ-bZ- 1377] Mh-,u-ih- 3-0] fMokbZl
ysUXost eslst Lisf'kfQds'ku $\frac{1}{4}$ Mh-,y-,e-,l- $\frac{1}{2}$ vFkok dksbZ baMLV^ah ekud
izksVksdky LFkkfir djuk pkfg;sA
izksizkbZVjh izksVksdky dh n'kk esa ehVj llyk;j dks mlds }kjk viukbZ xbZ
izksVksdky dk lk¶Vos;j rFkk C;kSjk izLrqr djuk pkfg;sA ekud izksVksdky
esa fdLH Hkh cnyko dh vkfIVekbZftax lapkj lalk/ku ds fLFkfr ds fy, fooj.k
nsuk pkfg;sA

8-6-29292929 ehVj dk fjizksxzkfeax %

;wfVyhVh dks isjkehVIZ ds fMLIys o ykfxax] VkbZfeaXl vkWQ VhvkMh
iath] fcfyax frfFk] ykfxax baVjoy vFkok dksbZ vU; ekunaM vkfIVdy iksVZ
rFkk@vFkok fjeksVyh A lh-,e-vkj-vkbZ- dk LFkkuh; Lrj ij mi;ksx dj lh-lh-
Mh-lh- esa LFkkfir fjizksxzkfeax lk¶Vos;j ds ek/;e ls p;u djus esa l{ke gksuk
pkfg;sA

8-6-30303030 MkVk dh MkmuyksfMax

vkfIVdy iksVZ rFkk@vFkok fjeksVyh dE;wfuds'ku iksVZ ds ek/;e ls
lhMhlhlh esa yxs ehVj baV^aksxs'ku lk¶Vos;j o lh-,e-vkj-vkbZ- dk mi;ksx djrs
gq, ;wfVyhVh dks ehVj esa vafdr MkVk MkmuyksM djus esa l{ke gksuk
pkfg;sA fdLH Hkh baV^aksxs'ku@jhm izpkyu ls dHkh Hkh fdLH Hkh LVksMZ
ehVj MkVk dks xk;c vFkok ifjofrZr ugha gksuk pkfg;,A
ckg~; lgk;d vkiwfrZ&

ehVfjax iz.kkyh viuh lapkyu laca/kh iz.kkyh dks ,lh vFkok Mhlh lgk;d iznk;
ls xzg.k djsxh A lgk;d iznk; ds fy, vakrfjd Mhlh cSVjh tks fd ehVj dk
vfoHkkT; Hkkx gS vFkok ehVj esa yxk, x, dsisflVj] dk mi;ksx fd;k tkuk
pkfg;,A

8-7 baLV^aqV^aqV^aqesaVs'ku V^akalQkeZj ds fy, U;wure rdudh vko';drk %

8-7-1 3 Qst 4 ok;j rFkk 3 Qst 3 ok;j vFkok 2 Qst 2 ok;j iz.kkyh $\frac{1}{4}$ Vs^aD'ku
,Iyhds'ku $\frac{1}{2}$ ekiu iz.kkyh ds fy, flaxy Qst VkbZi djsaV V^akalQkeZj dk gh
mi;ksx gksuk gh pkfg;sA VksVy lfdZV cMZu ij fuHkZj djrs gq, djsaV
V^akalQkeZj $\frac{1}{4}$ lhVh $\frac{1}{2}$ dk lsd.Mjh djsaV jsfVax ,d ,Eih;j vFkok 5 ,Eih;j gksuk
pkfg;sA fuEu cMZu lfdZV ds fy, 5 , lsd.M^ah dk mi;ksx fd;k tk ldrk gSA

8-7-2 ehVjhax ds fy, MsfMdsVsM lsV vkQ lhVh@OkhVh vFkok djsaV
 V^akalQkeZj dk MsfMdsVsM dksj gh miyC/k gksuk pkfg;s] rFkk tgka dgh
 Hkh laHkkO; gks] eq[; ehVj rFkk psd ehVj ds lhVh $\frac{1}{4}$ vFkok mldk dksj $\frac{1}{2}$ dh
 QhfMax vyx vyx gksuk pkfg;sA iz;ksx'kkyk vFkok LFky ij gh lhVh@ohVh
 ds =qfV dh tkap gksuh pkfg;sA us'kuy ,ØsfMVVsM eksckbZy ysczksVjh $\frac{1}{4}$,u-
 ,-ch-,y- $\frac{1}{2}$ vFkok fdLh ekU; ,u-,-ch-,y- iz;ksx'kkyk esa lhVh@ohVh ds
 nks''kksa dh tkap dh tkuh pkfg;sA

8-7-3 izR;sd djsaV V^akalQkeZj esa yxs dqy Hkkj fu/kkZfjr lhVh@ohVh ds
 fu/kkZfjr Hkkj ls vf/kd dnkfi ugh gksuk pkfg;sA U;wure =qfV ds fy, lhVh dk
 dqy lfdZV Hkkj fu/kkZfjr Hkkj ds djhc gksuk pkfg;s] rFkk ohVh yHM esa
 izfr'kr~ oksYVst M^aki dks Lohdk;Z lhek ds Hkhrj gh gksuk pkfg;sA

8-7-4 ehVjhax iz;ksu ds fy, bysDV^aksesXusfVd oksYVst V^akalQkeZj $\frac{1}{4}$ bZohVh $\frac{1}{2}$
 vFkok dsisflVho oksYVst V^akalQkeZj $\frac{1}{4}$ lhohVh $\frac{1}{2}$ dk mi;ksx fd;k tk ldrk
 gSA lkekU;r% bZohVh vFkok lhohVh dks doj djus oksYVst V^akalQkeZj
 $\frac{1}{4}$ ohVh $\frac{1}{2}$ dk mi;ksx fd;k tkrk gSA izfr Qst lsd.Mjh oksYVst
 110@ $\sqrt{3}$ oksYV gksxkA ohVh dh lqj {kk ds fy, lfdZV esa mi;qDr midj.k tSlS
 ,elhch yxk, tk,axsA

8-7-5 baLV^aqesUVs'ku V^akalQkeZj ds fy, U;wure Lohdk;Z fooj.k fofufnZ"Vrk,a
 fuEufyf[kr gS%&

, $\frac{1}{2}$, $\frac{1}{2}$, $\frac{1}{2}$, $\frac{1}{2}$

ehVjhax ds fy, djsaV V^akalQkeZj $\frac{1}{4}$ lhVh $\frac{1}{2}$ MsfMdsVsM flaxy QS
 bZ,poh o , Lohdk;Z fofufnZ"Vrk,a

Ø-	fooj.k	11 dsOh	33 dsOh	132dsOh	220dsOh
1	ukfeuy flLVe oksYVst $\frac{1}{4}$ dsOh	11	33	132	220
2	mPpre iz.kkyh oksYVst $\frac{1}{4}$ dsOh	12	36	145	245
3	lanHkZ ekud	v ru la'kks/ku lfgr vkbZ,l 2705			
4	ekud lhVh vuqikr	2000vFko k 1000@1	800vFkok 400@1&1	800vFkok 400@1&1 &1	1200vFkok 600 &1
		1600vFko k 800@1&	600vFkok 300@1&1	400vFkok 200@1&1 &1	800vFkok 400@1&1&1
		1200vFko k	400vFkok 200@1&1	200vFkok 100@1&1	
		800vFkok 400@1&1	300vFkok 150@1&1	100vFkok 50@1&1	
		600vFkok 300@1&1	100vFkok 50@1&1		
		400vFkok 200@1&1			
		300vFkok 150@1&1			
		150vFkok 75@1&1			
5	ehVfjax dksj dh	nks			

6	fu/kkZfjr lrr~ FkeZv disaV	fu/kkZfjr izkbZejh djsaV dk 120 izfr'kr			
7	fu/kkZfjr 'kkVZ VkbZe FkeZy izkbZeih disaV	13-1 ds, izfr lsdaM	26-2 ds, izfr 2 lsdaM	31-5@40 ds, izfr 1 lsdaM	40 ds, izfr 1 lsdaM
8	lhVh y{k.k				
,]	fu/kkZfjr izkFkfed disaV $\frac{1}{4}$,aih;j $\frac{1}{2}$	2000vFkok k 1000	800vFkok 400	400	800
		1600vFkok k 800	600vFkok 300	200	
		1200vFkok k 00	400vFkok 200	100	
		800vFkok 400	300vFkok 150	50	
		600vFkok 300	100vFkok 50		
		400vFkok 200			
		300vFkok 150			
		150vFkok 75			
ch]	fu/kkZfjr lsdaMihdisaV	1 vFkok 5	1 vFkok 5	1 vFkok 5	1 vFkok 5
lh -	,D;wjslh Js.kh	0-5,1	0-5,1	0-2,1	0-2,1
Mh -	Mh-vf/kdre baLV ^a wesa V	5	5	5	5
bZ -	fu/kkZfjr lsdaM ^a h Hkki	30	30	15	15
9	baLkwysfVax vkW:v ds fv.	v ru la'kks/ku lfgr vkbZ ,l 335			

chchchch- ehVjhax ds fy, MsfMdsVsM Fkzh Qst ,poh lhVh&ihVh lsV ds U;

Ø-	fooj.k	33 ds oh
lhVh $\frac{1}{4}$ lhVh&ihVh lsV ds fy, $\frac{1}{2}$ dk fofufnZ"V		
1	ukfeuy flLVe oksYVst $\frac{1}{4}$ dsOgh	33
2	mPpre iz.kkyh oksYVst $\frac{1}{4}$ ds oh	36
3	lanHkZ ekud	v ru la'kks/ku lfgr vkbZ,l 31
4	ekud lhVh jsf'k;ks $\frac{1}{4}$,aih;j $\frac{1}{2}$	200vFkok 100@1&1 100 vFkok 50@1&1
5	fu/kkZfjr lrr FkeZy djsaV	fu/kkZfjr izkbZejh djsaV dk
6	fu/kkZfjr 'kkVZ VkbZe FkeZy izkbZeih disaV izfr 1 lsdaM $\frac{1}{4}$ ds.	25
7	lhVh y{k.k	
,	, fu/kkZfjr izkbZejh djsaV $\frac{1}{4}$,aih;j $\frac{1}{2}$	200vFkok 100 100 vFkok 50
ch	fu/kkZfjr lsdaM ^a h djsaV $\frac{1}{4}$,aih;j $\frac{1}{2}$	1vFkok 5
lh	lh,D;wjslh Js.kh	0-5,1
Mh	vf/kdre baLV ^a wesaV lsD;wjhVh	10 ls de

	$\frac{1}{4}vkZ,1,Q\frac{1}{2}$	
b-	fu/kkZfjr lsdaM ^a h Hkkj $\frac{1}{4}oh,\frac{1}{2}$	30
8	balwysfVax vkW;y ds fy, lanHkZ	v ru la'kks/ku lfgr vkbZ,l 31
	ihVh $\frac{1}{4}lhVh\&ihVh$ lsV ds fy, $\frac{1}{2}$ dk	
1	ukfeuy flLVe oksYVst $\frac{1}{4}dsoh$	33
2	mPpre iz.kkyh oksYVst $\frac{1}{4}dsoh$	36
3	lanHkZ ekud	v ru la'kks/ku lfgr vkbZ,l 31
,	iksVfl;y ekiu ;= d fy, ldM ^a h okbZafMx dh la[.k	nks
ch	ekud oksYVst vuqikr	33 dsOgh@ $\sqrt{3}$ @110oh@ $\sqrt{3}$
lh	lhfu/kkZfjr lsdaM ^a h Hkkj $\frac{1}{4}oh,\frac{1}{2}$ izfr	50
Mh	,D;wjslh Dykl $\frac{1}{4}fu/kkZfjr$ oh, Hkkj dk 10% ls 100% ij $\frac{1}{2}$	0-5 ,l-
b	bZ fu/kkZfjr oksYVst QsDVj vkSj	1-2 lrr rFkk 1-5 izfr 30 lsda

lh- ehVjhax ds fy, MsfMdsVsM flaxy Qst bZ,poh dsisflVj oksYVst
U;wure Lohdk;Z fofuZns'k

Ø-	fooj.k	132 dsoh	220 dsoh
1	ukfeuy flLVe oksYVst	132	220
2	mPpre flLVe oksYVst	145	245
3	lanHkZ ekud	v ru la'kks/ku lfgr vkbZ,l 3156	
4	fu/kkZfjr dsfiflVsal $\frac{1}{4}ih,Q\frac{1}{2}$	4400 ih,Q VkyjsUl lfgr \$ 10% o & 5%	
5	laiw.kZ dsfj;j fQzDosalh ij fuEu oksYVst VfeZuv ds fv. $v\frac{1}{2}$ LVs ^a dsfiflVsal $c\frac{1}{2}$ LVs ^a dMDVsal	200 ih,Q ls dnkfi vf/kd ugh 20 ekbZØks lkbZeUl ls dnkfi vf/kd	
6	$v\frac{1}{2}$ laiw.kZ dsfj;j fQzDosalh jsat ds fy, mPp fQzDosalh $c\frac{1}{2}$ laiw.kZ fQzDosalh jsat ij bfDoosvsaV fliht isftLVsal	fu/kkZfjr dsfiflVsal ds 80% ls 150% ds Hkhrj 40 vksels de	
7	iksVsafl;y ekiu ;a= ds fyf, lsdaM ^a h okbZafMax dh la[.k	rhu	rhu
8	ekud oksYVst vuqikr $v\frac{1}{2}$ okbZfMax & 1] 2] 3	132 ds Ogh@ $\sqrt{3}$ @ 110 ds Ogh @ $\sqrt{3}$	
9	fu/kkZfjr lsdaM ^a h Hkkj $\frac{1}{4}Ogh$ $v\frac{1}{2}$ okbZfMax & 1 $c\frac{1}{2}$ okbZfMax & 2vkSj 3	----- 50	
10	,D;wjslh oxZ $v\frac{1}{2}$ okbZfMax&1 $c\frac{1}{2}$ okbZfMax & 2 $l\frac{1}{2}$ okbZfMax&3	3 ih 0-2 0-2	
11	fu/kkZfjr oksYVst QsDVj vkSj $v\frac{1}{2}$ okbZfMax&1 $c\frac{1}{2}$ okbZfMax & 2	1-2 lrr~ rFkk 1-5 izfr 30 lsdaM 1-2 lrr~ rFkk 1-5 izfr 30 lsdaM	
12	balwysfVax vkW;y ds fy,	v ru la'kks/ku lfgr vkbZ,l 335	

Vhi& bysDV^aksexusfVd ohVh dks 220 dsoh oxZ rd mi;ksx fd;k tk ldrk gSA

Mh^{1/2} ehVjhax ds fy, MsfMdsVsM flaxy Qst bZ,poh iksVsafly; y V^akalQkeZj
^{1/4}ihVh^{1/2} dk U;wure Lohdk;Z fofuZns'k

Ø-	fooj.k	132 dsoh	220 dsoh
1	ukfeuy flL Ve oksYVst ^{1/4} dsoh vki.e.l ^{1/2}	132	220
2	mPpre flL Ve oksYVst ^{1/4} dsoh vki.e.l ^{1/2}	145	245
3	lanHkZ ekud	v ru la'kks/ku lfgr vkbZ,l 3156	
4	iksVsafly; ekiu fMokbZl ds fy, lsdaM ^a h okbZfaMax dh laf:k	rhu	rhu
5	ekud oksYVst vuqikr		
	v ^{1/2} okbZfMax &1] 2] 3	132dsoh@√3 @ 110	220 dsoh@√3@ 110 dsoh@√3
6	fu/kkZfjr lsdaM ^a h Hkkj ^{1/4} oh, ^{1/2}		
	v ^{1/2} okbZfMax &1	-----	-----
	c ^{1/2} okbZafMax &2vkSj 3	50vkSj 100	50vkSj 100
7	,D;wjslh oxZ		
	v ^{1/2} okbZfMax &1	3 ih	
	c ^{1/2} okbZafMax &2	0-2	
	l ^{1/2} okbZafMax &3	0-2	
8	fu/kkZfjr oksYVst QsDVj rFkk vof/k		
	v ^{1/2} okbZfMax & 1	1-2 lrr~ rFkk 1-5 izfr 30 lsdaM	
	c ^{1/2} okbZafMax &2	1-2 lrr~ rFkk 1-5 izfr 30 lsdaM	
9	balwysfVax vkW;y ds fy,	v ru la'kks/ku lfgr vkbZ,l 335	

bZ^{1/2}bZ ehVjhax ds fy, MsfMdsVsM flaxy Qst ,poh iksVsafly; y Va^aklQkeZj dk
^{1/2}bZ^{1/2} U;wure Lohdk;Z fofuZns'k

Ø-	fooj.k	33 dsoh	11 dsoh
1	ukfeuy flL Ve oksYVst	33	11
2	mPpre flL Ve oksYVst	36	12
3	lanHkZ ekud	v ru la'kks/ku lfgr vkbZ,l 3156	
4	iksVsafly; ekiu fMokbZl ds fy, lsdaM ^a h okbZfaMax dh laf:k	rhu	rhu
5	ekud oksYVst vuqikr	33 dsoh@√3 110	11 dsoh@√3 110 dsoh@√3
6	fu/kkZfjr lsdaM ^a h Hkkj ^{1/4} oh, ^{1/2}		
	v ^{1/2} okbZfMax & 1	-----	-----
	c ^{1/2} okbZafMax &2	50	50
	l ^{1/2} okbZafMax &3	50	50
7	,D;wjslh oxZ ^{1/4} fu/kkZfjr Ogh ,Hkkj dk 10% ls 100% ij ^{1/2}	0-2	0-2
	v ^{1/2} okbZfMax &1	3 ih	
	c ^{1/2} okbZafMax &2	0-5	
	l ^{1/2} okbZafMax &3	0-5	
8	fu/kkZfjr oksYVst QsDVj rFkk	1-2 lrr~ rFkk 1-5 izfr 30 lsdaM	

8-8 O;oLFkk,a,a,a,a %

8-8-1 izR;sd bUVjQsl ehVj dk deh'kfuax ds le; ekfyd }kjk LFky ij csgrj ifj'kqf) ds lanfHkZr ekud ehVj ls ijh{k.k djuk pkfg,A ehVLZ dh VsflVax dks lqfo/kktud cukus lHkh EkhVjksa ij VsLV VfeZuy Cykd gksus pkfg;sA tkap ds fy, mPp ifj'kqf) LVsfVd lkslZ rFkk 5 xquk vf/kd $\frac{1}{4}$;k csgrj $\frac{1}{2}$ ifj'kqf) bysDV^akfud lanHkZ ekud ehVj lfgr iksVsZcy VsLV lsV dk mi;ksx fd;k tkuk pkfg;sA bldk rkRi;Z gS de ls de oXkZ 0-2 ,l ehVj ds fy, oxZ 0-1 ,l lanHkZ ekud ehVj] oxZ 0-5 ,l ehVj ds VsflVax ds fy, oxZ 0-1 ,l lanHkZ ekud ehVj rFkk oxZ 1-0 ,l ehVj ds VsflVax ds fy, oxZ 0-2 ,l lanHkZ ekud ehVj dk mi;ksx djuk pkfg,A bu csapksa dk mi;ksx iksVZscy ijh{k.k midj.k dh tkWp o ifjx.kuk ds fy, Hkh fd;k tkuk pkfg;sA ;s izko/kku ehVj ds iz;ksx'kkyk esa ijh{k.k ds fy, ykxw gksaxs] rFkkfi vkbZ,l&12346&1999 ds izko/kkuksa ds vuqlkj LFky ij ijh{k.k ds fy, ijh{k.k ds v/khu ehVj dh vis{kk ,d oxZ mPprj ifj'kqf) lfgr ijh{k.k midj.k gksuk pkfg;sA

8-8-2 eq[; o tk;p ehVj VsflVax ds fy, vyx&vyx VsLV VfeZuy Cykd gksus pkfg;sA rkfd tc ,d ehVj VsflVax esa gks rks nwljk ehVj VfsLVax vof/k esa okLrfod buthZ dks fjdkMZ djuk tkjh j[ksa tgi; dsoy ,d@eq[; ehVj gh gS ogk; eq[; ehVj ds ijh{k.k vof/k esa lfZdZV esa ,d vfrfjDr ehVj yxk;k tkuk pkfg;s] rkfd tc rd eq[; ehVj ijh{k.k eas jgs rks vU; ehVj] ,uthZ fjdkMZ dj ldsA

8-9 baVjQsl ehVj ds la;qDr fujh{k.k] tkap] dsfycsz'ku dh

8-9-1 tusjsfVax la;a=] jkT; V^akaleh'ku ;wfVyhVh rFkk forj.k ykbZlsalh ds e/; de ls de o"kZ esa ,d ckj $\frac{1}{4}$ vFkok ijLij lgefr ls ,d lky ls de ds varjky esa $\frac{1}{2}$ buthZ izs"k.k rFkk izkfIr $\frac{1}{4}$ vkgj.k $\frac{1}{2}$ ls laca/k nksuks vfHkdj.kksa }kjk ehVfjax ikbZUV esa LFkkfir ehVjhax iz.kkyh dk la;qDr :i ls fu;fer fujh{k.k] ijh{k.k rFkk ifjx.kuk fd;k tkuk pkfg;sA pawfd fuekZrk daiuh ds ifjlj esa lk¶Vos;j ds ek/;e ls LVsfVd V^akbZosDVj ehVj dsfycszV fd;k tkrk gSA vr% la;qDr fujh{k.k ds nkSjku ehVj dh ifj'kq)rk rFkk dk;Z dh gh tkap dh tkuh pkfg;sA fdlh rjg dh la'k; vFkok =qfV dh n'kk esa ehVj dks rRdky cny nsuk vFkok dsfycszV djuk pkfg;sA ckn dh n'kk esa fcfyax ds iz;kstu ds fy, tkWp ds vuqlkj ehVj fjMhax esa =qfV lq/kkj fd;k tk,xkA vfHkdj.k] tks ehVj@ehVjhax ikbZaV dk Lokeh gS] dks le; {kfr dks nwj djus vfrfjDr ehVj lnSo miyC/k j[kuk pkfg;sA tkap ds ckn ehVj dks leqfpr :i ls lhy djuk pkfg;s rFkk O;kid la;qDr fjiksVZ eas] fd, x, VsflVax] iqjkus gVx, x, lhy dk fooj.k rFkk yxk, x, u;s lhy dk C;kSjk] ijh{k.k ifj.kke rFkk vkxs dh tkus okyh dk;Zokgh $\frac{1}{4}$;fn dksbZ gks $\frac{1}{2}$ vkfn] dk fooj.k gksuk pkfg;sA

8-9-2 eq[; o tkap ehVj ds ehVj fjMhax $\frac{1}{4}$ bl izdkj ifj'kksf/kr $\frac{1}{2}$ tc dHkh muds ifj'kq)rk Js.kh ds vuqlkj vf/kdre =qfV lhek yka?krk gS] rks la;qDr fujh{k.k fd;k tkuk pkfg;sA LVsfVd QsUVE Hkkj ds ek/;e ls lqlaxr ekud ds vuqlkj lHkh Hkkj o ikoj QsDVj ij ehVj dh la;qDr tkap@dsfycszV dh tkuh pkfg;sA

8-10101010 hVj lhfyax dk izko/kku%&

8-10101010-1 ikWyhdkcksZusV vFkok ,dj;fyd vFkok IykfLVd vFkok gksyksxzkfQd lhysa vFkok fdlh vU; Js"Brj lhy dk mi;ksx fd;k tk,xkA

8-10101010-2 u;s ehVjksa esa lhls $\frac{1}{4}ySM\frac{1}{2}$ dh lhy mi;ksx esa ugh yh tk,xhA iqjkuh ehVjksa esa lhls $\frac{1}{4}ySM\frac{1}{2}$ dh lhy dks pj.kc) :i ls izfrLFkkfir fd;k tk,xk vkSj oSlk djus ds fy, vuqKflr/kkjh vk;ksx dks vuqeksnu gsrq ,d le;c) dk;ZØe izLrqr djsxkA

8-10101010-3 lacaf/kr i{kdkjksa ds vf/kd`r izfrfuf/k;ksa }kjk ehVjhax iz.kkyh dks la;qDr :i ls lhy fd;k tkuk pkfg;sA dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ ehVjksa dk izfr"Bkiu vkSj lapkyu $\frac{1}{2}$ fofu;e] 2006 ds izko/kkuksa ds vuqlkj ehVj lhfyax dh O;oLFkk dh tkuh pkfg;sA

8-10101010-4 bl ehVjhax lafgrk ds vuqlj.k esa flok; lhy yxkus okys vfHkdj.k dh vFkok ftldh rjQ ls lhy yxk;k x;k gks] mldh mifLFkfr vFkok mlds iwoZ lgefr ds dksbZ Hkh lhy u VwVuk pkfg;s vFkok u gVk;k tkuk pkfg; tc rd fd ifjLFkfr;ksa esa ,slk djuk $\frac{1}{4}1\frac{1}{2}$ vxk yxus vFkok mlh ds leku dksbZ [krjk iSnk gks x;k gks rFkk mls gVkuk vfr vfuok;Z gks ,oa rRdky lgefr izkIr djuk laHko ugh gks] $\frac{1}{4}2\frac{1}{2}$ ds [kjk gksus dh n'kk esa ,slh dk;Zokgh dh vko';drk gSA ,slh n'kk esa ekSf[kd lgefr rRdky yh tkuh pkfg;s vkSj ckn esa mldh iqf"V fyf[kr esa dh tkuh pkfg;sA

8- $\frac{1}{2}$ ehVj dh n'kk esa mi;ksx vk

11111111 tc dHkh eq[; ehVj vkSj pSd ehVj ds okpu esa fdlh ekg gsrq 0-5

8- izfr'kr ls vf/kd dk varj vkrk gks] rks fuEufyf[kr dk;Zokgh fd,

11111111- (i) lhVh vkSj ohVh la;kstuksa dh tkWp djuk(

1 $\frac{1}{4}d\frac{1}{2}$ (ii) LFky ij yxs gq, baVjQsl ehVj dh ifj'kq)rk dh] mPprj Js.kh dh ifj'kq)rk okys ekud ehVj ds lanHkZ esa tkaA

;fn ,slh tkWp vFkok iM+rky ds ckn Hkh varj cuk jgrk gS rks ,sls =qfViw.kZ ehVj dks] lgh ehVj ls izfrLFkkfir dj fn;k tk,xkA

$\frac{1}{4}[k\frac{1}{2}$ lafnX/k [kjkch dh n'kk esa tSlS ehVj dk ty tkuk vkSj ehVj ijkekudksa dk =qfViw.kZ n`f"Vxkspj $\frac{1}{4}fMLIys\frac{1}{2}$ gksuk vkSj tgkW miyC/k lqlaxr ekud ls vuqefr ;ksX; =qfV lhek ls vf/kd dh =qfV ehVj dh tkWp esa ik;h tkrh gS] ogkW ,slk ehVj] lgh ehVj ls izfrLFkkfir dj fn;k tk,xkA

$\frac{1}{4}x\frac{1}{2}$ oSlh n'kk esa tgk; eq[; ehVj vkSj tk;ip ehVj nksukas gh [kjk ik, tkrs gSa] ogk; buesa ls de ls de ,d ehVj] 'kh?kz gh lgh ehVj ls izfrLFkkfir dj fn;k tkuk pkfg;A

8-11111111-2tgkW eq[; ehVj =qfViw.kZ ik;k x;k gS vFkok can gks x;k gS] fcfyax ds mn~ns'; ls tkWp ehVj dk okpu fopkj esa bl 'krZ ds lkFk fy;k tk,xk fd ,slk pSd ehVj lE;d~ :i ls dke djrk ik;k tk,A

8-11111111-3 ,sls izdj.k esa tgkW eq[; vkSj tkWp ehVj nksuksa gh [kjk gksa] vkSj ;fn varjorhZ vof/k esa fdlh ÅtkZ dk varj ifjorZu gqv k gks rks bldk vkdyu tujsVj ds izs"k.k Nksj ij yxs ehVj $\frac{1}{4}LVSaM$ ckbZ ehVj $\frac{1}{2}$ ds vk/kkj ij

fd;k tk,xk] ;fn og lE;d~ :i ls dke dj jgk gksA ,slk djus esa iwoZorhZ mu rhu efguksa dk izfr'kr ykbZu gkfu dks fopkj esa fy;k tk,xk] ftl le; baVjQsl ehVj vkSj tujsVj ds ehVj nksukas lE;d :i ls dk;Z djrs jgs gksaA

8-11111111-4 ,sls izdj.k esa tggW eq[;]tkWp ehVj rFkk tujsVj ds izs"k.k Nksj dk ehVj $\frac{1}{4}$ LVSaM ckbZ ehVj $\frac{1}{2}$ rhuksa gh [kjc gksa] rks jkT; fxzM esa izfo"V dh xbZ ÅtkZ dks foxr rhu efguksa esa vuqKflr/kkj ds lacaf/kr midUnz ls vkSlr ÅtkZ gkfu ds vk/kkj ij ifjxf.kr fd;k tk,xk] tcf eq[;@tkWp ehVj lE;d~ :i ls dk;Z djrs jgs gksaA
eq[;tkWp rFkk LVSaM ckbZ ehVjksa }kjk ntZ jhfMaxksa dk izR;sd VkbZe LykWV ds fy, fo'ys"k.k] ijLij tkWp rFkk iqf"Vdj.k jkT; Hkkj izs"k.k dsUnz }kjk fd;k tk,xkA folaxfr;ka] ;fn dksbZ gksa tks jhfMax esa idM+h tk,a dh tkudkj jkT; Hkkj izs"k.k dsUnz }kjk jkT; ikjs"k.k miØe vFkok vuqKflr/kkj dks nh tk,xh tks tkWp] ifjx.kuk vFkok lacaf/kr =qfViw.kZ ehVjksa ds cnyus ds laca/k esa iwoZxkeh vuqca/kksa esa n'kkZ, vuqlkj vko';d dk;Zokgh djsaxsA

8-11111111-5 ,sls izdj.k esa tggW ehVj ,sls Fkksd miHkksDrk ds iflj esa izfr"Bkfr gSa tks vksiu ,Dlsl dk ykHk ys jgk gS vFkok ftls ikjs"k.k iz.kkyh ls lh/ks iznk; fd;k tk jgk gS] ;fn [kjc gks tkrk gS rks ÅtkZ fudklh dk vkdyu NRrhlx<+ jkT; fo|qr iznk; lafgrk esa le;≤ ij mYysf[kr miHkksDrkvksa ds fy, fofufnZ"V izko/kkuksa ds vuqlkj fd;k tk,xkA

8-11111111-6 jkT; ikjs"k.k miØe {ks=h; baVkbZfV;ksa vkSj vU; fpfUgr fcUnqvksa ds chp leLr varj la;sktuksa ij okLrfod 'kq) ,e-MCyw-,p- varj ifjorZu vkSj ,e-Ogh-,vkj-,p- vkgj.kksa dks ntZ djus ds fy, fo'ks"k ÅtkZ ehVj izfr"Bkfr djsxkA ,sls fo'ks"k ÅtkZ ehVjksa dk izfr"Bkiu] lapkyu vkSj la/kkj.k dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ ehVjksa dk izfr"Bkiu vkSj lapkyu $\frac{1}{2}$ fofu;e] 2006 ds vuqlj.k esa fd;k tk,xkA leLr lacaf/kr baVkbZfV;ka $\frac{1}{4}$ ftuds ifljksa esa fo'ks"k ÅtkZ ehVj izfr"Bkfr fd, x, gS $\frac{1}{2}$ lirkfgd :i ls ,sls ehVjksa ds jhfMax ysaxs rFkk mls izfr lkseokj nksigj rd ,l-,y-Mh-lh- dks Hkst nsaxsA ,l-,y-Mh-lh- dks ;g lqfufpr djuk gksxk fd muds fu;a=k {ks= esa lHkh izfr"Bkiuksa ls ehVj dk ,slk MkVk vkj,yMhlh dks vuqlwph ds vuqlkj Hkst fn;k tk,A

8-12121212 [kjc vFkok LVd&vi ehVj dk izfrLFkkfir fd;k tkuk&

[kjc vFkok can $\frac{1}{4}$ LVd vi $\frac{1}{2}$ ehVj dks 15 fnol ds Hkhrj izfrLFkkfir djuk pkfg;sA ehVj ds Lokeh dks ehVj dk Lis;j buosaVjh vius ikl vo'; gh j[kuk pkfg;s rkfd Mkmu VkbZe dks U;wure fd;k tk ldsA

8-13131313 fookn ds fujkdj.k gsrq ra=&

jkT; ikjs"k.k miØe rFkk fdll Hkh tusjsfVax daiuh@forj.k ykbZlsalh@ jkT;karxZr mi;ksxdrkZ ds e/; ;wfVyhVh ehVjhax lacaf/kr fdll fookn dk fuiVku] ikoj ipsZl vuqca/k $\frac{1}{4}$ ihih, $\frac{1}{2}$ @la;kstu vuqca/k vFkok lqlaxr vuqca/k ds v/khu izfØ;k ds vuqlkj ;Fkk izdj.k] fd;k tkosxkA fookn dk fuiVku u gksus dh n'kk esa] izdj.k vk;ksx ds le{k izLrqr fd;k tkosxkA

8- ehVfjax rFkk lapkj izkS|ksfxdh esa lrr rFkk rhoz mUu;u ds vuqlj.k esa
 1414 ehVfiar lafgrk dh lkof/kd leh{kk} dsUnzh: folar izkf/kdi.k¼lhbZ.½
 le;≤ ij vk;ksx funsZ'k ns ldrk gSA

&&000&&

v/;k;&9

vkdfLedr&;kstuk

¼dUVsatsUlh

Iykfuax½

9-1lkekU; fl)kar%

9-2;g v/;k; ikjs"k.k iz.kkyh ds [kjkC gksus] vFkok fdlh izdkj tujs'ku esa vpkud {kfr
 vFkok osLVuZ fxzM esa [kjkch ds dkj.k ;k Cysd vkmV dh n'kk esa fxzM dhs
 vfr'kh?kz laHkkfor cgkyh izkIr djus ds fy, jkT;karfjd mi;ksxdrkZ ds
 mRrjnkf;Ro dks ifjHkkf"kr djus gsrq gSA vkdfLedr ls fuiVus ds fy, leLr tyh;
 ¼gkbM^aks½ dsUnzksa ds ikl vfuok;Zr% CySdLVkVZ dh lqfo/kk gksuh pkfg,
 vkSj 220 kV vkSj Åij ds leLr vfr mPp nkc midsUnzksa esa flaØksukbts'ku
 lqfo/kk gksuh pkfg,A CySd vkmV dh fLFkfr esa rhoz cgkyh ds fy, viuk;h tkus
 okyh izfØ;k esa fuEufyf[kr ckrksa dks /;ku esa j[kk tk,xk%&

(i) varjZT;h; V^akalfe'ku ykbZu ds ek;/e ls iM+kslh iz.kkyh ls laHkkfor
 ikoj varj.k(

(ii) dsUnzh; lsDVj tujsfVax dsUnz rFkk tujsfVax la;a= ls vfoyac ikoj dh
 miyC/krk dh fLFkfr(

(iii) jkT; fxzM ls la;ksfr fdlh fufgr ¼bEcsMsM½ tujsVj ls ÅtkZ dh
 miyC/krk A

9-1-1fuEufyf[kr dks izkIr djuk eq[; mn~ns'; gS%&

(i) vko';d vfuok;Z yksM dh rRdky cgkyhA

(ii) vYire laHkkfor le; esa lexz iz.kkyh rFkk lac) ekax dh cgkyhA

(iii) iz.kkyh ds bu va'kksa dk fjflaØksukbZts'ku tks flaØksfute esa ugha jgs
 gaSA

(iv) ;g lqfuf'pr djuk fd iz.kkyh esa xaHkhj ck/kk dh fLFkfr esa ,l-,y-Mh-lh]
 ikjs"k.k vuqKfIr/kkjH rFkk jkT;karfjd mi;ksxdrkZ ds ofj"B izca/ku
 izfrfuf/kRo ds mi;ksx ds fy, lapkj O;oLFkk] miyC/k gksa] tks ikjs"k.k
 vuqKfIr/kkjH vFkok jkT;karfjd mi;ksxdrkZ dh rjQ ls fu.kZ; ysus ds fy,
 vf/kd`r gSA

(v) ;g lqfuf'pr djuk fd fdUgha dkj.kksa ls ,l-,y-Mh-lh- ds {kerckg~;
 ¼budsiflVsVsM½ gks tkus dh n'kk esa Hkh ikjs"k.k iz.kkyh dk
 izpkyu tkjh jgsA

(vi) lexz Cysd vkmV dh n'kk esa tujsfVax dsUnzksa] V^akaleh'ku ykbZu dh miyC/krk yksM dh fMekaM dh vkdfLedrk $\frac{1}{4}$ dafVutsalh $\frac{1}{2}$ vkus ds iwoZ dh fLFkfr O;kid :i ls cgkyh viukus dh izfØ;k r; djsxkA

(vii) leL;k dh lhek r; djus esa MCywwkj,yMhlh o ,l-Vh-;w- ds lkFk ,l-,y-Mh-lh- leUo;u djsxkA cgkyh ds fy, ,l-,y-Mh-lh- vf/kdre jkT;karfjd mi;ksxdrkZvksa dks ifjLFkfr ds ckjsa esa tkudkj nsxk rFkk cgkyh gsrq bl /kkjk esa fyf[kr j.kuhfr dk ikyu djus mUgsa lykg nsxkA

(viii) laiw.kZ dafVutsalh vof/k esa lHkh lapkj pSuyksa dk mi;ksx] lkekU; n'kk $\frac{1}{4}$ ukeZYlh $\frac{1}{2}$ dh cgkyh rd dsoy vkij'skuy lapkj rd gh lhfer gksxkA

9-2 lexz {ks=h; Cysd vkmV (Total regional blackout)-

lexz {ks=h; Cysd vkmV dh n'kk esa if'peh {ks= ds lHkh ?kVd ds lkFk ijke'kZ dj MCywwkj,yMhlh }kjk rS;kj Cysd LVkVZ izfØ;k ds vuqlkj cgkyh dh tkuh pkfg;sA tSlk

fd ;s izfØ;k lkef;d :i ls v|ru dh tkrh gSA vr% lexz {ks=h; Cysd vkmV ds nkSjku vafre v|ru izfØ;k dk gh ikyu fd;k tkuk pkfg;s A

9-3 vkaf'kd jkT; ikjs"k.k iz.kkyh Cysd vkmV (Partial transmission system blackout) :

dj ,l-,y-Mh-lh- }kjk cukbZ xbZ Cysd LVkVZ@fjLVksjs'ku izfØ;k ds vuqlkj cgkyh dh tkuh pkfg;sA pwafd ;s izfØ;k lkef;d v|ru gS] vr% vafre v|ru izfØ;k dk vkaf'kd jkT; V^akaleh'ku iz.kkyh Cysd vkmV ds nkSjku ikyu djuk gksxkA vkaf'kd Cysd vkmV ls iz.kkyh dh cgkyh esa ,l-,y-Mh-lh- }kjk tkjh vuqns'k dk ikyu mi;ksxdrkZvksa }kjk vo'; fd;k tkuk pkfg;] Hkys gh bldk Li"V mYys[k Cysd LVkVZ izfØ;k@cgkyh izys[k esa u gksA

9-4 nkf;Ro %&

9-4-1 Cysd LVkVZ {kerk lfgr tujsfVax la;a=ksa rFkk Cysd LVkVZ vkij'sku IykUk dk fjdkMZ ,l-,y-Mh-lh- }kjk j[kk tk,sxk A

9-4-2 lexz vFkok vkaf'kd Cysd vkmV ds ckn ikjs"k.k iz.kkyh dh cgkyh gsrq ^Cysd LVkVZ^ dks ,l-,y-Mh-lh- rS;kj djsxk] v|ru $\frac{1}{4}$ viMsV $\frac{1}{2}$ djsxk ,oa forj.k djsxkA jkT;karfjd Cysd LVkVZ izfØ;k ls vfuok;Zr% lger gksaxs rFkk tgka Hkh os dfBukbZ dk vuqHko djsa ,l-,y-Mh-lh- dks rRjrk ls lwfpr djsaxs A

9-4-3 lHkh jkT;karfjd mi;ksxdrkZ rFkk MCYkw-vkj-,y-Mh-lh- ls fudV leUo;u }kjk lexz ikjs"k.k iz.kkyh jsLVksjs'ku izkslsl funsZ'k ds fy, ,l-,y-Mh-lh- mRrjnk;h gksxkA

9-4-4 Hkkj ds dusDV u gksus okys Cykd] ds lsaDluykbZftax ds fy, forj.k ykbZlsalh mRrjnk;h gksxkA flaØksukbZt gksus okys la;a= esa rqjar vkus okys visf{kr Hkkj dh ek=k ls os ,l-,y-Mh-lh- dks vfuok;Zr% voxr dj,saxsA

9-4-5 ,l-,y-Mh-lh- ds lwpuk ij viuk IykUM ^Cysd LVkVZ^

la;a= gh ftEesokj gksxk rFkk ,l-,y-Mh-lh- }kjk lwfpr ekax ds vuqlkj viuk tuj's'ku c<+k;saxsA

9-5 izko/kku (Special Consideration) %&%&%&%&

9-5-1ikjs"k.k iz.kkyh vFkok {ks=h; iz.kkyh esa Cysd vkmV dh ifjfLFkfr esa cgkyh ds izfØ;k ds nkSjku] oksYVst rFkk fYDOSalh dk lkekU; ekunaM ykxw djus dh vko';drk ugh gS] rFkk ;g ,l-,y-Mh-lh- ds foosd ij gh NksM+k tkrk gS fd og fo|eku ifjfLFkfr esa fuHkZj djrs gq, tks mi;qDr le>sA

9-5-2forj.k ykbZlsalh dks vfuok;Z Hkkj ds xSj vko';d vo;o dks igpkuuk pkfg;s ftls iz.kkyh dafVutsalh ds nkSjku vyx j[kk tk ldsA izR;sd izdj.k esa rn~uq:ih Hkkj Cykd lfgr mUgsas mi;qDr 'ksM~;wy Hkh cukuk pkfg;sA xSj vfuok;Z Hkkj dks dsoy rHkh cgky djuk pkfg;s tc iz.kkyh lkekU; gks tk;s rFkk tSlk ,l-,y-Mh-lh- lykg nsA

9-5-3tYnckth vFkok vuqi;qDr Hkkj ds dkj.k iz.kkyh ds nwljh ckj /oLr gksus dks jksdus ds fy, lHkh jkT;karfjd mi;ksxdrkZvksa dks izfØ;k ds ikyu gsrq fo'ks"k /;ku nsuk vfuok;Z gSA

9-5-4ifjfLFkfr dh vifjgk;Zrk ds ckotwn] ?kVuk rFkk cgkyh izfØ;k ds dq'kyrk ds vuqorhZ tkap dks lqfo/kktud cukus lHkh jkT;karfjd mi;ksxdrkZ }kjk lHkh la/kkj.k dk;Z rFkk la/kkj.kh; lans'kksa dks lko/kkuh iwoZd o Rofjr ykWfxax lqfuf'pr fd;k tkuk pkfg;sA ?kVuk ds ckn 'kh?kzrk ls bldh tkap dh tkuh pkfg, rFkk ,l-,y-Mh-lh- }kjk fudV Hkfo"; esa gksus okyh jkT; fxzM leUo; lfefr dh vxyh cSBd esa tkudkj dh fy, izLrqr djuk pkfg,A

&&000&&

v/;k;&10101010

lqj{kk ekun.M

10101010-1 lqj{kk ekun.M ¼Safety Standards½%½%½%½%½%

10101010-1-1;s lqj{kk ekunaM lkekU; turk] fo|qr miHkksDrk rFkk dkexkjksa dh lqj{kk lqfuf'pr djus ds fy, rS;kj fd;s x;s gSa A ;g bl lafgrk dk vfoHkkT; vax gS rFkk ,l-Vh-;w-@ikjs"k.k vuqKfIr/kkjH rFkk leLr jkT;karfjd mi;ksxdrkZ dks bu ekunaMksa rFkk dsUnzh; fo|qr izkf/kdj.k }kjk tkjh ekunaMksa] tSls&dsUnzh; fo|qr izkf/kdj.k ¼fo|qr'gksa rFkk fo|qr ykbZuksa ds fuekZ.k] lapkyu rFkk la/kkj.k gsrq laj{kk vko';drk,a ½ fofu;e] 2011] dsUnzh; fo|qr izkf/kdj.k ¼laj{kk vkSj fo|qr iznk; ls lacaf/kr mik;½ fofu;e] 2010 dk vuqiky djuk gksxk A

10101010 bl ekunaM ij vk/kkfjr ikjs"k.k ykbZu] midsUnz ds fy, ,l-Vh-;w-@

-1-2 (i)

ikis"k.k ls¶Vh esU;wvvl rS:ki disaxsA izR:sd

vkis'ku ,.M eSaVsusal esU;wvy ykbZlsalh }kjk

cuk;k tkosxkA midsUnz esa yxs fofHkUu midj.kksa ds fuekZrkvksa }kjk dh xbZ flQkfj'k ij vk/kkfjr lHkh la/kkj.k rFkk la/kkj.k 'ksM~;wy bu esU;wvyksa es lekfo"V gksaxsA izkIr vuqHko rFkk midj.kksa dks cnyus ds vk/kkj ij bu esU;wvyksa dh lkef;d leh{kk gksuh pkfg;sA LVs'ku cSVjh lfgr midj.kksa ds fy, ,d esaVsusal jftLVj lacaf/kr midsUnzksa esa gksuh pkfg;sA tc Hkh la/kkj.k dk;Z fd;k tkrk gS bUgsa v|ru viMsV fd;k tkuk pkfg;s rFkk mi;qDr mPprj vf/kdkjh] ftlds fu;a=.k esa midsUnz gS] }kjk bldh lkef;d leh{kk dh

tkuh pkfg;sA ikjs"k.k dh ykbZuksa ds fy, Hkh ,slk gh jftLVj j[kk tkuk pkfg,A

(ii) jkT; ikjs"k.k miØe@ikjs"k.k vuqKflr/kkjh leqfpr :i ls vkgrkZ izkIr fdllh O;fDr dks dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ fo|qrx`gksa rFkk fo|qr ykbZuksa ds fuekZ.k] lapkyu rFkk la/kkj.k gsrq laj{kk vko';drk,a $\frac{1}{2}$ fofu;e] 2011 vkSj dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ lqj{kk rFkk fo|qr iznk; ls lacaf/kr mik; $\frac{1}{2}$ fofu;e] 2011 esa fofufnZ"V fd, vuqlkj] lqj{kk mik;ksa rFkk dk;Z dks lqfuf'pr djus gsrq lqj{kk i)fr@mik; ds leUo; ds fy, fo|qr lqj{kk vf/kdkjh inkafdr djasxsA

10101010-1-3midj.k ij dk;Z djus ds fy, Li"Vr% vkbZlksys'ku rFkk vfFkZax dk fooj.k vkij'sku esU;wvy esa gksuk pkfg;sA midsUnz esa fofHkUu vkbZlksysfVax ;a=ksa dh fLFkfr crkus okys flaxy ykbZu Mk;xzke dks mi;qDr LFkku ij iznf'kZr fd;k tkuk pkfg;sA izR;sd midsUnz ij izeq[krk ls vkbZlksysVsM midj.k ij dke djus okys dkexkjksa ds fy, Li"V ykbo ikVZ ls Dyh;jsal $\frac{1}{4}$ lsD'ku Dyh;jsal $\frac{1}{2}$ fn[kkus okys pkVZ~l izeq[krk ls iznf'kZr fd;k tkuk pkfg,A

10101010-1-4dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ laj{kk vkSj fo|qr iznk; ls lacaf/kr mik; $\frac{1}{2}$ fofu;e] 2010 vkSj lqlaxr Hkkjrh; ekunaMksa esa visf{kr [krjk $\frac{1}{4}$ MsUtj $\frac{1}{2}$ cksMZ dks vke turk }kjk n`f"Vxr gksus okys LFkku ij iznf'kZr fd;k tkuk pkfg;sA

10101010-1-5IS%5613 ds vuqlkj lHkh ikjs"k.k ykbZuksa ij fu;fer la/kkj.k dk;Z vfuok;Zr% fd;k tkuk pkfg;s rFkk bu lc dk fjdkMZ Hkh j[kk tkuk pkfg;sA tc Hkh laHko gks [kjc gq, bUlwysVjksa dk izfrLFkku vkSj la/kkj.k dk;Z rFkk gkWV ykbZu psfdax ekulwu ls igys vkSj ckn esa Hkh dh tkuh pkfg,A laosnu'khy ikjs"k.k ykbZuksa vkSj midsUnzksa ds la/kkj.k esa] tgkW dgha laHko gks gkWV ykbZu rduhdh dk iz;ksx fd;k tkuk pkfg,A gkWV ykbZu rduhd esa flQZ izf'kf{kr LVkQ dk mi;ksx djuk pkfg, vkSj ,slh rduhd esa iz;qDr vkStkjksa ds mi;ksx ds fy,

vko';d izek.k&i= fdllh jk"V^ah; vFkok varj jk"V^ah; ekU;rk izkIr iz;ksx'kkyk ls] iz;ksxiwoZ izkIr djus gksaxsA

10101010-1-6fjlhohax dsUnz rFkk midsUnz ds lHkh midj.k fuekZrk esU;wvy rFkk izklkafxHkkjrh; rFkk@vFkok varj jk"V^ah; ekunaM tgka dgha Hkh mi;qDr gks] ds vuqlkj vPNh n'kk esa j[kk tkuk pkfg;sA fjys rFkk lfdZV cszjd dks tc dHkh mUgsa la/kkj.k ds iz;kstu ds fy, ckgj fudkyk tkrk gS] muds mfpr lapkyu ds fy, tkWp fd;k tkuk pkfg;sA fu;fer tkWp rFkk la/kkj.k dk;Z }kjk LVs'ku cSVjh dks vPNh pkyw n'kk esa j[kk tkuk pkfg;sA bu dsUnzksa esa miyC/k Mh-lh- iz.kkyh dks leqfpr <ax ls bl izdkj j[kk tkuk pkfg, fd yhdst djsaV U;wure gksA yhdst rFkk xzkm.M QkYV dh ekfuVjhax gsrq vkWuykbZu ekfuVjhax iz.kkyh miyC/k gksuk pkfg,A ikjaijfd le; vk/kkfjr la/kkj.k dh rgyuk esa la/kkj.k dhs funkukRed i)fr;ksa dks vf/keku fn;k tkuk pkfg,A leLr vksoj gsM ykbZuksa rFkk midsUnzksa ds 220 dsOgh- vkSj vf/kd ds oksYVst Lrj okys midj.kksa dh gkWV LikWV tkWp gsrq

FkeksZfot+u Ldsfuax o"kZ esa U;wure ,d ckj djkbZ tk,xh vkSj tgkW dgha
 gkWV LikWV ik, tk,a ogka vko';d funkukRed mik; viuk, tk,axsA
 V^akalQkeZjksa] fj;sDVjksa] czsdjksa lfgr leLr izeq[k midj.kksa ds fy, tSlk
 lqlaxr ekunaMksa esa fu:fir fd;k x;k gS] 'ks"k thou dky dk fu/kkZj.k fd;k
 tk,xkA dsUnzh; fo|qr izkf/kdj.k ¼fxzM ekun.M½ fofu;e] 2010 ds fofu;e 25
 ds vuqlkj midj.kksa dh ifjLFkfr vk/kkfjr fuxjkuh gsrq funkukRed rduhd dk
 mi;ksx fd;k tkuk pkfg,A leLr la/kkj.k dk;kZs dk vfHkys[k izR;sd midj.k ds
 fy, mi;qDr rkfydk vkSj izk:i esa bysDV^akfud QkeZ rFkk gkMZ dkWih lfgr
 j[kk tkuk pkfg, rFkk mlesa dk;Z dh izR;sd en ds laca/k esa la/kkj.k dh vxyh
 frfFk Li"V :i ls vafdr dh tk,xhA

101 ykbZu Dyh;j ijfeV ¼,ylih½ %

010 bvsfDV^adv vkbZu vFkok midi.k ii dk:Z dius iifeV gsra rFkk tc bvsfDV^ad
 vFkok midj.k ij dke lekIr gks tkos] ijfeV ykSVkus ds fy, vuqjks/k dk izk:Ik
 ifjfFk"V&^^x^^ rFkk ^^?k^^ dk gh mi;ksx djuk gksxkA

&&000&&

v/k;&11

lapkyuxr ?kVuk,a ¼vkijs'kuy bosUV½ rFkk bfUIMsaV fjiksZfVax

11111111-1 izfrosnuh; ?kVuk ¼fjiksVsZcy bfUIMsaV½ %

11111111-1-1ikjs"k.k iz.kkyl dh leLr ?kVuk,a ¼bosaV~l½ tks iz.kkyl dks
 izHkkfor djrh gSa] jkT; ikjs"k.k

miØe@ ikjs"k.k vuqKfIr/kkjh }kjk ,l-,y-Mh-lh- rFkk lacaf/kr jkT;karfjd
 mi;ksxdrkZvksa

ftldh iz.kkyl izHkkfor gqbZ gS]dks lwfpr fd, tk,axsA

11111111-1-2jkT;karfjd mi;ksxdrkZ dh iz.kkyl esa gqbZ lHkh ,slh ?kVuk,a
 ¼bosaV~l½ tks ikjs"k.k iz.kkyl ij

lapkyu izHkko ¼vkijs'kuy bQsDV½ Mkyrh gS] jkT;karfjd mi;ksxdrkZ }kjk
 jkT; ikjs"k.k

miØe @ikjs"k.k vuqKfIr/kkjh rFkk ,l-,y-Mh-lh- dks lwfpr djuh gksxh] tks
 vkxs bUgsa mu

jkT;karfjd mi;ksxdrkZvksa dks vf/klwfpr djsaxs] ftudh iz.kkyl ij ,slh ?kVuk
 lapkyu

izHkko Mky ldrh gks A jkT;karfjd mi;ksxdrkZ bl lafgrk ds vuqPNsn 11-2-2
 esa n'kkZ,

fcUnqvksa dks lekfg djrs gq, ,slh ?kVukvksa ¼bosaV~l½ dk izfrosnu
 ¼fjiksVZ½ djsaxs A

11111111-1-3ikjs"k.k iz.kkyl dks izHkkfor dj ldus okys izfrosnuh; ¼fjiksZVscy
 bfUIMsaV½ ds fofFk"V

mnkgj.k fuEukuqlkj gSa %

,½ vioknLo:i mPp@fuEu oksYVst vFkok fYDosalh (

ch^{1/2} xaHkhj midj.k leL;k vFkkZr estj lfdZV cszdj] V^akalQkeZj] cl ckj esa [kjkch (

lh^{1/2} tujsfVax ;wfuV esa cM+h leL;k (

Mh^{1/2} vkbZlhVh] V^akalfe'ku ykbZu vFkok dsisflVj csad] fj,DVj dh fV^afiar(

bZ^{1/2} cM+h vkx nq?kZVuk] vka/kh&rwQku] Hkw dai vkfn (

,Q^{1/2} cM+h lqj {kk foQyrk ^{1/4}Major protection failure^{1/2} (

th^{1/2} midj.k vFkok V^akalfe'ku ykbZu dk vksOgj yksfMax] ftlls yksxksa ij ladV iSnk gks

(

,p^{1/2} fdllh vykeZ dk lfØ; gksuk ^{1/4},DVhos'ku^{1/2} vFkok vlkekU; vkijsfVax fLFkfr dk

ladsr ^{1/4}baMhds'ku^{1/2} (

vkbZ^{1/2} vuqHko dh tk jgh vFkok iwokZuqeku ^{1/4}QksjdkLV^{1/2} ds vuqlkj izfrdwy tyok;q n'kk (

ts^{1/2} la;a= rFkk@vFkok miLdjksa dh {kerk esa cszd Mkmu] vFkok QkYV] vFkok vLFkkbZ

{kerk ifjorZu (

ds^{1/2} lqj {kk lapkyu ^{1/4}Protection operation^{1/2} ij vklUu ladV (

,y^{1/2} Hkkj dh {kfr (

,e^{1/2} nq?kZVuk,sa (

,u^{1/2} vfr'k; fudklh ^{1/4}M^akWy^{1/2}&fopyu (

vks^{1/2} NksVs midj.k esa vykeZ A

Vhi & ^{1/4}i^{1/2} vafre nks fjiksVZscy ?kVuk,a ,sls fof'k"V mnkgj.k gSa] ftudk ifj.kke ugha ds cjkj

gS] ijUrq fQj Hkh os ikjs" k.k iz.kkyh dks izHkkfor djrh gaS rFkk mUgsa xkS.k ^{1/4}ekbZuj^{1/2} ds

:i esa mfpr :i ls oxhZd`r fd;k tk ldrk gSA

^{1/4}ii^{1/2} Åij fyf[kr mnkgj.k dsoy mnkgj.kLo:i gh gS rFkk fdllh Hkh rjg fjiksVZ djus dh lkekU; vko';drk dks lhfer ugha djrsA

11111111-2 fjiksfVZax izfØ;k

11-2-1fxzM midsUnz esa 33 dsoh rFkk mlls Åij ds ykbZu rFkk midj.k esa gksus okys lHkh fjiksVZscy ?kVuk dh Rofjr ekSf[kd fjiksVZ] jkT;karfjd mi;ksxdrkZ ftlds midj.k ij ?kVuk ?kVh gS] }kjk lHkh izeq[k izHkkfor gksus okys jkT;karfjd mi;ksxdrkZvksa rFkk ,l-,y-Mh-lh- dks dh tkuh pkfg;sa ,slh ekSf[kd fjiksVZ ds ,d ?kaVs ds Hkhrj jkT;karfjd mi;ksxdrkZ vfuok;Zr% bldh fyf[kr iqf"V ,l-,y-Mh-lh- dks Hkstsxka ;fn ?kVuk dh izd`fr cM+h gS rks bldh fyf[kr fjiksVZ nks ?kaVs ds Hkhrj vkSj mlds ckn izkfjafHkd fyf[kr

fjiksVZ izLrqr djus ds 48 ?kaVs ds Hkhrj fof/kor O;kid fjiksVZ izLrqr djuk gksxkA vU; izdj.k esa fjiksfVZax mi;ksxdrkZ ,l-,y-Mh-lh- dks 5 dk;Z fnol ds Hkhrj fjiksVZ izLrqr djsxkA

11-2-2vU; fdlh jkT;karfjd mi;ksxdrkZ dks izHkkfor djus okyh fdlh fjiksVZscy ?kVuk ij fdlh Hkh jkT;karfjd mi;ksxdrkZ ls ,l-,y-Mh-lh- fjiksVZ dh ekax dj ldrk gS] ftldk midj.k fjiksVZscy bfUIMsaV dk L=ksr gS] ;fn mlus fjiksVZ ugha dh gks A RkFkkfi] bls fdlh jkT;karfjd mi;ksxdrkZ dks ;Fkkfo|eku dsUnzh; fo|qr izkf/kdj.k ¼laj{kk vkSj fo|qr iznk; ls lacaf/kr mik;½ fofu;e] 2010 vuqlkj ?kVuk fjiksVZ djus dh vfuok;Zrk ls NwV ugha feysxhA ,sls izfrosnu dk izk:i fxzM leUo; lfefr ds vuqeksnu ds vuqlkj gksxk rFkk blesa fuEufyf[kr fo'ks"k :i ls lekfo"V gksaxs%&

,½ ?kVuk dk LFkku (

ch½ ?kVuk dh frfFk o le; (

lh½ izHkkfor la;a= vFkok midj.k (

Mh½ iznk; O;o/kku rFkk vof/k] tgka iz;ksT; gks (

bZ½ tujs'ku {kfr dh ek=k] tgka dgha iz;ksT; gks (

,Q½ ?kVuk ds iwoZ rFkk ckn esa iz.kkyh ekun.M] ¼oksYVst] fÝDosalh]

¶lyks] tujs'ku vkfn½(

th½ ?kVuk ds igys usVodZ dkWfUQxjs'ku (

,p½ fjys baMhds'kal rFkk lqj{kk fu"iknu ¼performance½ (

vkbZ½ ?kVuk dk laf{klr fooj.k (

ts½ lsok esa okilh dk vuqekfur le; (

ds½ dksbZ vU; izklafxd lwpuk (

,y½ Hkkoh lq/kkj gsrq vuq'kalk (rFkk

,e½ fjiksfVZax vf/kdkjh dk uke o inuke A

11-2-3fjikZV esa ?kVuk dk i;kZIr fooj.k gksuk pkfg,] ftlls fd izkfIrdkZ] ?kVuk ls mRiUu fLFkfr rFkk tksf[ke dk vkdyu dj ldsA dkj.k dks fjiksVZ esa fy[kuk vko';d ugha gS] ijUrq izkfIrdkZ ;Fkk vko';d Li"Vhdj.k nsus ds fy, dg ldrk gS rFkk ;g vfuok;Z gS fd fjiksfVZax jkT;karfjd mi;ksxdrkZ vko';d rFkk mfpr leLr tkudkj nsus gsrq viuk Hkjld iz;kl djs] rFkk lHkh vko';d o mfpr tkudkfj;ka vfuok;Zr% nasA

11-2-4vU; i{k }kjk vuqjks/k djus dh n'kk esa ekSf[kd fjiksVZ izs"kd }kjk VsfyQksu eslst ds :i esa fMDVsV djuk pkfg;s rFkk izkIrdkZ }kjk fy[k yh tkuh pkfg;s vFkok QSDl@bZ&esy ls izsf"kr djuk pkfg,A vkikrdky dh n'kk esa fjiksVZ dsoy ekSf[kd nh tk ldrh gS rFkk rRdky ml ds ckn fyf[kr iqf"V dh tkuh pkfg;sA

11-2-5?kVuk dh ekSf[kd fjiksVZ ds fy, Lohdk;Z vf/kdre le; lhek] ?kVuk gksus ds le; ls 15 feuV ds Hkhrj vuqefr ;ksX; gSA

11-2-6vkbZbZthlh esa fyf[kr izfØ;k ds vuqlkj bosUV fjiksfVZax ds fy, ,l-,y-Mh-lh-mÜkjnk;h gksxkA

11111111-3 egRoiw.kZ ?kVuk,a $\frac{1}{4}$ Significant event $\frac{1}{2}\%$ &

11-3-1egRoiw.kZ ?kVuk esa ,sls ?kVuk 'kkfey gksrh gaS] ftlds dkj.k lapkyuxr vlj $\frac{1}{4}$ bQsDV $\frac{1}{2}$ gksrk gS] tSls $\%$ &

, $\frac{1}{2}$ la;a= rFkk@vFkok midj.k dh esU;wvyh vFkok Lopfyr fV^afiar

ch $\frac{1}{2}$ oS/k lhek ds ckgj oksYVst

lh $\frac{1}{2}$ oS/k lhek ds ckgj iz.kkjh fQzDosalh

Mh $\frac{1}{2}$ iz.kkjh vfLFkjrk vFkok

bZ $\frac{1}{2}$ iz.kkjh vksOgiyksM

11-3-2tgka dgha jkT;karfjd mi;ksxdrkZ ?kVuk dk fjiksVZ djrk gS] ftls ,l-,y-Mh-lh-vFkok jkT; ikjs"k.k miØe @ikjs"k.k vuqKflr/kkjhh le>rk gS fd ikjs"k.k iz.kkjh] ij mldk vFkZiw.kZ izHkko iM+k gS] jkT; ikjs"k.k miØe @ikjs"k.k vuqKflr/kkjhh] jkT;karfjd mi;ksxdrkZ ls ?kVuk dh fjiksVZ fyf[kr esa ,d fnu ds Hkhrj nsus dh vko';drk ij tksj ns ldrk gSA

11-3-3tgka dgha jkT; ikjs"k.k miØe @ikjs"k.k vuqKflr/kkjhh] ,l-,y-Mh-lh- rFkk jkT;karfjd mi;ksxdrkZ dks fdllh ?kVuk dh vf/klwpuk nsrk gS] ftls mi;ksxdrkZ vFkok ,l-,y-Mh-lh- le>rk gS fd jkT;karfjd mi;ksxdrkZ iz.kkjh ij mldk vFkZiw.kZ izHkko iM+k gS] rks ,d fnu ds Hkhrj ikjs"k.k vuqKflr/kkjhh ls ?kVuk dh fyf[kr eas fjiksVZ djus gsrq jkT;karfjd mi;ksxdrkZ vis{kk dj ldrk gSA

11111111-4 psrkofu;ka $\%$ &

11-4-1tc ,l-,y-Mh-lh- dks irk pyrk gS fd lexx] vFkok laiw.kZ iz.kkjh vFkok mlds va'k dks O;kid rFkk xaHkhj ck/kk dk ladV gSA rks ,l-,y-Mh-lh- }kjk jkT; ikjs"k.k miØe @ikjs"k.k vuqKflr/kkjhh rFkk jkT;karfjd mi;ksxdrkZ dks ekSf[kd psrkouh tkjh dh tkosxh rFkk fyf[kr esa mldh iqf"V dh tkosxh]

11-4-2tc i;kZIr le; miyC/k gS] psrkouh esa ,slh lwpuk gksxh] tks ,l-,y-Mh-lh- mfpr le>rk gS] ftlesa mi;ksxdrkZ rFkk ,l-Vh;w-@V^akaleh'ku ykbZlsalh dks ladV dh izd'fr o iwokZuqekfur ck/kk dh lhek le>kus esa lgk;d gksxh] c'krsZa fd ,slh tkudkjhh ,l-,y-Mh-lh- ds ikl miyC/k gksA

11-4-3,slh psrkouh izkfIr ij izR;sd mi;ksxdrkZ rFkk ,lVh;w@V^akaleh'ku ykbZlsalh] vfuok;Zr% vius vkij'skuy LVkWQ dks psrkouh nsrs gq, vko';d dne mBkosxk rFkk rkfd og la;a= o midj.k dks ,slh n'kk esa j[k lds] ftlls ;Fkk iqf"V@psrkouh vof/k ds fy, iwokZuqekfur ck/kk dk lkeuk fd;k tk ldsA

11-4-4,slh psrkouh vof/k ds nkSjku 'ksM~;wfyax rFkk izs"k.k izHkkfor gks ldrs gSaA

11111111-5 ds lkFk lapkj {kfr $\frac{1}{4}$ Loss of communication with SLDC $\frac{1}{2}$ %&

11-5-1,l,y-Mh-lh- ds lkFk lapkj {kfr dh n'kk esa mij fyf[kr mica/k ykxw ugh gksasxs ijUrq mlds cnys fuEufyf[kr izko/kku ykxw gksasxs%

11-5-2,l,y-Mh-lh- }kjk tkjh vafre iza"K.k vuqns'k ds vuqlkj izR;sd tujsfVax la;a= la/kkj.k tkjh j[ksxk] ijUrq ekfuVjhax djrs gq, fYDosalh dks Hkkjrh; fo|qr fxzM dksM fofu;e] 2010 ds vuqlkj 49-5 gV~Zt ls 50-2 gV~Zt ds chp iz.kkyh fYDosalh dks cuk;s j[kus gsrq lHkh mfpr iz;kl djsxk tc rd ,l,y-Mh-lh- ls dksbZ u;k iza"K.k vuqns'k izkIr ugh gks tkrkA

111 ck/kk $\frac{1}{4}$ Major Failure $\frac{1}{2}$ %&

111 tc dHkh dksbZ cM+h ck/kk ?kfVr gksrh gS] jkT; ikjs"K.k miØe @ikjs"K.k vU; jkT;karfjd mi;ksxdrkZ lg;ksx djsaxs rFkk ,sls vlQyrk ds dkj.kksa dh tkap djsasxs rFkk leqfpr flQkfj'k izLrqr djsaxsA jkT; ikjs"K.k miØe tkap fjiksVZ fxzM leUo; lfefr dks izLrqr djsxkA

11111111-7 nq?kZVuk fjiksfVZax %

11-7-1tujs'ku] V^akaleh'ku] forj.k] vkiwfrZ vFkok fo|qr mi;ksx vFkok fo|qr ykbZu ds fdllh Hkkx esa vFkok fdllh O;fDr ds fo|qr la;a= ds lEcU/k esa dksbZ nq?kZVuk ftldk izHkko fdllh ekuo thou dh {kfr ;k pksV ds :i esa iM+k gks ;k laHkkfor gks rks ml ij dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ fo|qrx`gksa vkSj fo|qr ykbZuksa ds fuekZ.k] lapkyu vkSj la/kkj.k gsrq laj{kk vko';drk,a $\frac{1}{2}$ fofu;e] 2008] le; le; ij ;Fkk la'kksf/kr esa mYysf[kr izfØ;k ds vuqlkj dk;Zokgh fd;k tkuk pkfg;sa

11-7-2 leLr nq?kZVukvksa dh fjiksfVZax lacaf/kr izkf/kdj.kdks izpfyr fu;eksa ds vuqlkj dh tkuh pkfg;A

&&000&&

v;/k; 12

MkVk iath;u $\frac{1}{4}$ Data registration)

12121212-1 mRrjnkf;Ro %&

12-1-1leLr jkT;karfjd mi;ksxdrkZ] fxzM lafgrk ds mica/kksa ds vuqlkj v|ru MkVk izLrqr djus ds fy, mÜkjnk;h gS A leLr jkT;karfjd mi;ksxdrkZ MkVk Hkstus ds fy, mÜkjnk;h O;fDr;ksa ds uke] irs rFkk VsfyQksu la[;k ,l,y-Mh-lh-@jkT; ikjs"K.k miØe $\frac{1}{4}$,l-Vh;-w- $\frac{1}{2}$ dks vfuok;Zr% HkstsaxsA ,l,y-Mh-lh-@jkT; ikjs"K.k miØe $\frac{1}{4}$,l-Vh;-w- $\frac{1}{2}$ lHkh mi;ksxdrkZvksa dks ,slk MkVk izkIr djus ds fy, mRrjnk;h O;fDr;ksa ds uke] irs rFkk VsfYkQksu la[;k lwfpr djsxkA

12-1-2fxzM lafgrk ds izklafxd v;/k; esa micaf/kr MkVk] ,l,y-Mh-lh- jkT;karfjd mi;ksxdrkZvksa dks nsxkA

12-1-3bu MkVk ds lgh gksus dk nkf;Ro] lacaf/kr MkVk miyC/k djkus okys jkT;karfjd mi;ksxdrkZvksa dk gksxkA

12-1-4MkVk izLrqfr ds fy, ekunaM izk:i ds :i esa MkVk vuqlwph cuk;h x;h gS rFkk bu izk:iksa dk mi;ksx fyf[kr MkVk izLrqfr ds fy, fd;k tkuk pkfg;sa

mi;ksxdrkZ dks lqfuf'pr djuk pkfg;s fd u;k Hkou] <kapk] ifjo/kZu $\frac{1}{4}$,fM'ku $\frac{1}{2}$] mUu;u $\frac{1}{4}$ eksfMfQds'ku $\frac{1}{2}$ rFkk vU; dksbZ fuekZ.k ifj;kstuk] ykbZlsalh ds fo|eku vkiwfrZ ykbZu ls visf{kr U;wure nwjh j[ksaA dsUnzh; fo|qr izkf/kdj.k $\frac{1}{4}$ lqj{kk rFkk fo|qr iznk; ls lacaf/kr mik; $\frac{1}{2}$ fofu;e] 2011 esa ;s U;wure nwjh mYysf[kr gSaA

13131313-2 vikyu rFkk vuknj $\frac{1}{4}$ Non-compliance and Derogation $\frac{1}{2}$

13131313-2-1;fn dksbZ jkT;karfjd mi;ksxdrkZ fxzM lafgrk ds fdlh Hkh mica/k dk vuqikyu djus dh fLFkr esa ugh gS] vFkok vuqikyu djus esa vlQYk jgrk gS] mls fcuk foyac fd, vius vikyu ds dkj.kkas lfr ,l-,y-Mh-lh- dks lwfpr djuk pkfg;s rFkk ikyu ds fy, rRijrk ls mik; $\frac{1}{4}$ remedy $\frac{1}{2}$ djuk pkfg;sA

13131313-2-2{kerk dh xyr ?kks"kk] ,l-,y-Mh-lh- ds Hkkj izs"kk vuqns'k dk vikyu] fcuk mi;qDr dkj.k ds csfdax Mkmu ds fy, ,l-,y-Mh-lh- ds vuqns'k dk vikyu] MkVk vizLrqfr vkfn] fxzM lafgrk dh vikyu ifj/k esa vkosaxs] ftl ij vk;ksx }kjk n.M izfØ;k dk fu.kZ; ys ldsxkA

13131313-2-3bl fxzM lafgrk ds fdlh v;k; vFkok fdlh /kkjk fo'ks"kk ds vikyu dh fLFkr] ;fn dksbZ gks] rks og vk;ksx dh vuqefr ls vkSj mlds fy, ,d fof'k"V le; gsrq gksxk A fxzM lafgrk dh fdlh okaNk dk vikyu viokn Lo:i gksxk vkSj lkekU;r% bldh vuqefr rHkh nh tk,xh tc fdlh jkT;karfjd mi;ksxdrkZ ds fy, bls okafNr le; esa vuqikyu djuk dfBu vFkok vlqfo/kktud ugha vfirq vlaHko gks A fdlh jkT;karfjd mi;ksxdrkZ }kjk ,sls vikyu ds fy, vuqer le; vof/k ds ckn vk;ksx }kjk fuf'pr naM yxk;k tk,xk A

13131313-3 ukfVl dh rkfehy %

dksbZ i=] vkns'k ;k izi= ykbZlsalh }kjk mi;ksxdrkZ dks fof/kor fn;k x;k ekuk tkosxk] ;fn fyf[kr esa rkfehy fd;k x;k] genLr fn;k x;k] vFkok MkWd@dksfj;j QSDl ;k bZ&esy }kjk miHkksDrk ds vkosnu vFkok mi;ksxdrkZ ds vuqca/k esa ;fn vuqca/k fd;k x;k vFkok ykbZlsalh dks i'pkr vf/klwfpr fd;k x;k] esa mYysf[kr irs ij izsf"kr fd;k x;k gksA ifjlj esa ukfVl nsus ds fy, dksbZ O;fDr u feys rks mls ifjlj ds izeq[k n""VO; LFkku ij fpidk nsuk pkfg;s vkSj ;g ekuk tkosxk fd ukfVl rkfehy gks xbZA
yk;lsalh@,l-,y-Mh-lh- dks lHkh lapkj] yk;lsalh@,l-,y-Mh-lh- dks miyC/k dj, x, irs ij fd;k tkuk pkfg, A

13-4 vn""V ifjLFkr;ka (Unforeseen circumstances) @vifjgk;Z ?kVuk

$\frac{1}{4}$, $\frac{1}{2}$ vn""V ifjLFkr;ka] ;fn ,slh ifjLFkr ftdk fxzM lafgrk ds mica/k esa fopkj ugh fd;k x;k gS] vkSj og mRiUu gks tkrk gS] rks ,l-,y-Mh-lh-@ ykbZlsalh bu ifjLFkr;ksa eas ;Fkksfpr lhek rd] ln~Hkkouk iwoZd lHkh izHkkfor i{kdkjksa ls] 'kh?kz lgefr djus ds iz;kl esa] fd D;k fd;k tk;s] ijke'kZ dj ldrk gSA jkT;karxZr mi;ksxdrkZ rFkk ,l-,y-Mh-lh-@ ykbZlsalh ds e/; miyC/k le; esa ;fn lgefr ugh gksrk gS rks ykbZlsalh@,l-,y-Mh-lh- viuh ;ksX;rk vuqlkj mfpr <ax ls bl ij fu.kZ; ys ldrk gSA tc dHkh ykbZlsalh@,l-,y-Mh-lh- ,slk fu.kZ; ysrk gS] rks

og lnSo fu.kZ; ysrs le; izHkkfor i{kdkjksa ds n`f"Vdks.k dk lEeku djrs gq, bls ;Fkk laHko /;ku esa j[ksxk] fd ,slh ifjLFkfr;ksa eas D;k djuk mfpr gSA ,sls fu.kZ; ds ckn izR;sd i{kdkj ykbZlsalh @ ,l-,y-Mh-lh-}kjk fn, x, vuqns'k dk ikyu djsxkA ,l-,y-Mh-lh-@ykbZlsalh rRjrk ls lHkh ,sls vn`"V ifjLFkfr;ksa] rFkk dksbZ bl rjg ds fu.kZ; dh tkudkj vk;ksx dks vfoyac nsxkA

$\frac{1}{4}ch\frac{1}{2}$ vifjgk;Z ?kVuk] ,slh dksbZ ?kVuk tks jkT;karfjd mi;ksxdrkZ ds fu;a=.k ls ijs gks vFkok tks mlds fy, vn`"V jgh gks vFkok tks ;qfDriw.kZ foosd ds mijkar Hkh vuqeku esa u vk lds vFkok ftls cpk;k u tk lds vkSj tks nksuksa esa ls fdllh ,tsalh ds dk;Z fu"iknu dks lkjHkwr <ax ls izHkkfor djs fdUrq tks fuEufyf[kr rd lhfer u gks %&

$\frac{1}{4}1\frac{1}{2}$ bZ'ojh; ?kVuk] uSlfxZd iz?kVuk lfgr fdUrq ck<+] lw[kk] HkwdEi rFkk egkekfj;ksa rd lhfer ugha (

$\frac{1}{4}2\frac{1}{2}$ vkarfjd vFkok fons'kh ljdkj ds dksbZ dk;Z fdUrq ?kksf"kr ;k v?kksf"kr ;q) fonzksq] vkradh geys] fu"ks/kkKk o minzo rd lhfer ugh(

$\frac{1}{4}3\frac{1}{2}$ naxs vFkok ukxfjd foIyo(

$\frac{1}{4}4\frac{1}{2}$ fufgr ,tsafl;ksa dh otg ls u gks] ,slh fxzM dh vlQyrk A

13131313-5 O;k[k; k $\frac{1}{4}$ Interpretation $\frac{1}{2}\% \frac{1}{2}\% \frac{1}{2}\% \frac{1}{2}\%$

;s 'krsZa lHkh n`f"V ls Hkkjrh; ljdkj foy[s[kksa ds lanHkZ esa i<+h vkSj vFkkZfUor dh tk,axh vkSj fof/k dk cy j[ksaxh rFkk Hkkjrh; fo|qr vf/kfu;e 2003 vkSj le;≤ ij ;Fkkla'kksf/kr fu;eksa vFkok@vkSj mlds varxZr fojfr fofu;eksa] buesa vk;ksx }kjk le;≤ ij tkjh@ fojfr ;Fkkla'kksf/kr vFkok le;≤ ij iqu% vf/kfu;fer fofu;e Hkh lfEefyr gSa] ds vuqlkj iw.kZ :i ls i<+k o le>k tk,xkA

bl lafgrk ds O;k[k; k vFkok dk;Z {ks= vFkok vFkZ ds lEcU/k esa fdllh rjg dk fookn gksus dh n'kk esa] vk;ksx dh O;k[k; k lHkh lacaf/krksa ij vafre o ca/kudkj gksxkA

13131313-6 dfBukbZ;ka nwj djus dh 'kfDr $\frac{1}{4}$ Power to remove

difficulties $\frac{1}{2}\% \frac{1}{2}\% \frac{1}{2}\% \frac{1}{2}\%$

bls fdllh Hkh izko/kku dks izHkko'khy cukus esa fdllh rjg dh dfBukbZ vkus ij] izdj.k vk;ksx dks Hkstk tk ldrk gS] tks izHkkfor i{kdkjksa ls lykg djus ds ckn tgka vko';d le>s] ,slk lkekU; vFkok fof'k"V vkns'k ikfjr dj ldsxk] tks vf/kfu;e vFkok rRle; izHkko'khy fo|qr ikjs"k.k o vkiwfrZ ds lEcU/k esa fdllh vU; vf/kfu;fevr@vf/kfu;e ls vlaxr ugha gks] tks dfBukbZ nwj djus ds iz;ksu ds fy, vko';d vFkok okaNuh; izrhr gksrk gksA

vk;ksx fdllh ikjs"k.k vuqKflr/kkjH vFkok jkT;karfjd mi;ksxdrkZ dks] ;k rks Lor% vFkok ,sls ikjs"k.k vuqKflr/kkjH vFkok jkT;karfjd mi;ksxdrkZ }kjk izLrqr vkosnu ds vk/kkj ij] mudks jkT; fxzM lafgrk dks ykxw djus vFkok

vuqiky ds nkf;Ro ls vius funsZ'kksa esa fofgr lhek rd] NwV iznku djus
funsZ'k tkjh dj ldsxkA

13131313-7 dk {ks=kf/kdkj $\frac{1}{4}$ Jurisdiction of Court $\frac{1}{2}$ %

bl lafgrk rFkk mlds varxZr cus vuqca/k ls mRiUu lHkh dk;Zokfg;ka dsoy
mlh U;k;y; esa izLrqr gksaxh] ftlds {ks=kf/kdkj esa vuqca/k fu"lkkfnr gqvk
gSA

13131313-8 fujlu $\frac{1}{4}$ Repeal $\frac{1}{2}$ %

bl fxzM lafgrk ds jkti= esa izdk'ku ds lkFk gh] NRrhlx<+ jkT; fo|qr fxzM
lafgrk] 2007 vkSj bls :ikarj.k] tks fnukad 09@09@2008 dks tkjh fd, Fks] bl
fxzM lafgrk dh vf/klwpuk ds fnukad ls lapkfyr gksuk can gks tk,axs A

13131313-9 O;ko`fRr $\frac{1}{4}$ Savings $\frac{1}{2}$ %

bl lafgrk dh dksbZ Hkh ckr vk;ksx dh izfØ;k ds nq;i;ksx dks jksdus rFkk
U;k; ds mn~ns'; dks izkIr djus] vk;ksx dh vko';drkuqlkj ,sls vkns'k ikfjr djus
dh varfuZfgr 'kfDr dks lhfer djus vFkok vU;Fkk ugha djsxhA

vf/kfu;e ds izko/kkuksa ds vuq;i vk;ksx dks vU; dksbZ izfØ;k viukus ls ;g
lafgrk dnkfi jksd ugha ldsxh] tks bl fxzM lafgrk ds fdll Hkh izko/kku ls
fHkUu gks] fo"k; vFkok fo"k;ksa ds oxZ dh fo'ks"k ifjfLFkfr;ksa dh n`f"V ls
vk;ksx] dkj.kksa dks vfHkfyf[kr djrs gq,] ,sls fo"k; vFkok fo"k;ksa ds oxZ
dks O;ogkj djus ds fy,] ftUgSa og vko';d vFkok okaNuh; le>rk gS] dk;Zokgh
dj ldsxk A

fxzM lafgrk esa] ftlds fy, dksbZ izko/kku ugh gS] mlds fy, vf/kfu;e ds varxZr
vk;ksx dks fdll fo"k; ls O;ogkj djus vFkok fdll 'kfDr dk mi;ksx djus ls ;g
lafgrk] ijks{k vFkok vijks{k :i ls ugha jksdsxh rFkk vk;ksx ,sls fo"k;ksa]
'kfDr;ksa o fo"k; esa vius <ax ls dk;Z dj ldrk gS] tks og mfpr ;k mi;qDr
le>sA

Vhi%& bu fofu;eksa ds fgUnh ikB ls vaxszth ikB ds fuoZpu vFkok le> esa fdll rjg
ds erHksn gksus dh n'kk esa] vk;ksx dk fu.kZ; vafre o ca/kudkj gksxkA

vk;ksx ds vkns'k ls]

,u- flag

lfpo

ifjf"V&d

;kstuk gsrq MkVk vko';drk $\frac{1}{4}$ vuqPNsn 3

Hkx&1

mRiknu

$\frac{1}{4}$ tujsfVax daiuh }kj jkT; ikjs"k.k miØe dks izLrqr djus

gsrq $\frac{1}{2}$

,&1 ekunaM Iykfuax MkVk

$\frac{1}{4}$ tujs'ku $\frac{1}{2}$

,&1-1- rkih; $\frac{1}{4}$ FkeZy $\frac{1}{2}$

I. lkekU;

1- LFky	ekxZ] jsyykbZu] V ^a kaleh'ku ykbZu] unh] tyk'k; ¼;fn dksbZ gks½ iznfkZr djus okyk ¼LdhesfVd½ yksds'ku uD'kk izLrqr djsa
2- fuekZ.k dh vuqekfur	
3- ,e-MCY;w- esa okf''k mRiknu	

II. dusD'ku

1- dusD'ku ikbZaV@baVjQsl ikbZaV	vU; vkCLV ^a DVsM vkmVysV ds fy, jkbZV vkWQ os gsrq laHkkfor Li''V bafMds'ku lfgr V ^a kaleh'ku iz.kkyh ds lkFk iz Lrkfor dusD'ku dk flaxy ykbZ u Mk;xz ke layXu djsA
2- dusD'ku dsoh gsrq LVs vi oksYVst	

III. dsUnz {kerk

1- mRiknu dsUnz dqy {kerk ¼esxkokV½	
2- ;wfuV rFkk ;wfuV lkbZt esxkokV dh la[;k	D;k pj.kksa esa fodkl fd;k tkuk gS \;fn gka rks fooj.k la yXu djsa

IV. tujsfVax ;wfuV MkVk %

1.	1. ok''i tujsfVax ;wfuV	
	izdkj] {kerk] ok''i izs'kj] LVhe rki vkfn	
2.	2. LVhe VjckbZu izdkj {kerk	
3.	tujsVj	
¼,	esd o izdkj	
½	jsfVax ¼,eoh,½	
¼C	VfeZuy oksYVst ¼ds oh½	
kh	fu/kkZfjr ikoj QsDVj	
¼bZ½	izfrfØ;k'khy ikoj {kerk ¼,eOgh,vkj½ 0-95 yhfMax jast rFkk 0-85 ysfxax esa	
¼,Q½	'kkVZ lfdZVvuqikr	
¼th½	Mk;jsDV ,fDII V ^a kaft,UV fj,DVsal ¼,eoh, jsfVaxds izfr'kr esa½	
¼,p½	Mk;jsDV,fDII lc&V ^a kaft,UV fj,DVsal ¼,eoh, jsfVax ds izfr'kr esa½	
¼vkbZ½	lgk;d ikoj vko';drk	
¼Tks½	,eMCyw vFkok ,eMCyw,vkj {kerk doZ	
2.		
¼,½	izdkj	
¼ch½	fu/kkZfjr {kerk ¼,eoh,½	

$\frac{1}{4}lh\frac{1}{2}$	oksYVstvuqikr $\frac{1}{4},poh@,yoh\frac{1}{2}$	
$\frac{1}{4}Mh\frac{1}{2}$	Vsi psat jsat $\frac{1}{4}\$ \% ls \& \% \frac{1}{2}$	
$\frac{1}{4}bZ\frac{1}{2}$	izfr'kr bfEiMsUl $\frac{1}{4}Qwy yksM ij ikftfVo$	

, -1-2 foLr'r Iykfuax MkVk $\frac{1}{4}tujs'ku\frac{1}{2}$

FkeZy tujsfVax dsUnz %

I- lkekU;

, - tujsfVax dsUnz dk uke %

ch- tujsfVax ;wfuV dh {kerk esxkokV esa %

lh- tujsfVax dsUnz o Lohp;kMZ dk flaxy ykbZu Mk;xzke%

Mh- fjysbax o ehVfjax Mk;xzke

bZ- tujsfVax ;wfuVksa dk U;wV^ay xzkmf.Max

,Q- ,DlkbZVs'ku fu;a=.k

th- vFkZ jsftLVsal osY;w lfgr vfFkZax O;oLFkk

,p- lapkj & LFkkfir ih,ylhlh o vU; lapkj midj.kksa dk fooj.k

2- ehVfjax o izksVsD'ku

1- tujsfVax ;wfuV] tujsfVax ;wfuV V^akalQkeZj] lgk;d V^akalQkeZj rFkk estj midj.k ds fo|qr

eksVj tSls ckW;yj QhM iEi] vkbZMh Qsu] daMsulsV ,DLVs^aD'ku iEi vkfn esa yxs lHkh fjys

o izksVsD'ku iz.kkyh gsrq lsfVax lfgr iw.kZ fooj.kA

2- tujsfVax dsUnz Lohp;kMZ] VkbZ lfdZV cszdj] budfeax lfdZV cszdj ls lHkh vkmVxksfoax

QhMj ij LFkkfir lHkh fjys ds fy, lsfVax lfgr iw.kZ fooj.kA

3- V^akaleh'ku iz.kkyh esa dusD'ku $\frac{1}{4}ikbZaV@baVjQsl ikbZaV ij\frac{1}{2} lfdZV cszdj$ ds baVj fV^afiar dk

iw.kZ fooj.kA

4- mi;ksxdrkZ iz.kkyh ij fo|qr QkYV ds fy, vfr'k; laHkkfor QkYV Dyh;jsal le;

5- vkij'skuy o dkef'kZ;y ehVfjax Ldhe dk iw.kZ fooj.k

6- cszdj ds vksiuhax ds lqj {kkRed fjys ds igy ls cszdj vkij'sfVax le; dh x.kuk

III- Lohp ;kMZ

1- bZ,poh@,poh V^akaleh'ku iz.kkyh rFkk tujsVj V^akalQkeZj oksYVst iz.kkyh ds e/;

baVjdusfDVax V^akalQkeZj ds lEcU/k esa %

$\frac{1}{4},\frac{1}{2}$ fu/kkZfjr ,eoh,

$\frac{1}{4}ch\frac{1}{2}$ oksYVst vuqikr

$\frac{1}{4}lh\frac{1}{2}$ osDVj leqg

$\frac{1}{4}Mh\frac{1}{2}$ ikftfVo flDosal fj,DVsal $\frac{1}{4}vf/kdre]$ U;wure] lkekU; Vsi $\frac{1}{4},eoh,$
ds % esa $\frac{1}{2}$

$\frac{1}{4}bZ\frac{1}{2}$ ikftfVo flDosal jsftLVsal $\frac{1}{4}vf/kdre]$ U;wure] lkekU; Vsi $\frac{1}{4},eoh,$
ds % esa $\frac{1}{2}$

$\frac{1}{4},Q\frac{1}{2}$ thjks flDosal fj,DVsal $\frac{1}{4},eoh,$ ds % esa $\frac{1}{2}$

$\frac{1}{4}th\frac{1}{2}$ VSi psatj jsat $\frac{1}{4}+ \% ls \&\%$) rFkk LVsII

$\frac{1}{4},p\frac{1}{2}$ Vsi psatj dk izdkj $\frac{1}{4}vkWQ@vku\frac{1}{2}$

$\frac{1}{4}vkbZ\frac{1}{2}$ vkbZlhVh ds VjfVvjh okbZafMax ls dusDVsM lfdZV rFkk fj,DVj
dk iw.kZ fooj.k

$\frac{1}{4}ts\frac{1}{2}$ xzkmf.Max i)fr

2- dusD'ku ikbZaV ls dusDVsM Lohp xs;j lfgr lfdZV cszdj] vkblksYksVj lHkh
lfdZV ij] ds

IEcU/k esa%

$\frac{1}{4},\frac{1}{2}$ fu/kkZfjr oksYVst $\frac{1}{4}dsoh\frac{1}{2}$

$\frac{1}{4}ch\frac{1}{2}$ cszdj ds izdkj $\frac{1}{4},evkslhch@,chlhch@,l,Q6-----\frac{1}{2}$

$\frac{1}{4}lh\frac{1}{2}$ fu/kkZfjr 'kkVZ lfdZV cszfdax djsaV $\frac{1}{4}ds,\frac{1}{2}$ 3 Qst

$\frac{1}{4}Mh\frac{1}{2}$ fu/kkZfjr 'kkVZ lfdZV cszfdax djsaV $\frac{1}{4}ds,\frac{1}{2}$ 1 Qst

$\frac{1}{4}bZ\frac{1}{2}$ fu/kkZfjr 'kkVZ lfdZV esfdax djsaV $\frac{1}{4}ds,\frac{1}{2}$ 3 Qst

$\frac{1}{4},Q\frac{1}{2}$ fu/kkZfjr 'kkVZ lfdZV esfdax djsaV $\frac{1}{4}ds,\frac{1}{2}$ 1 Qst

$\frac{1}{4}th\frac{1}{2}$ C;kSjk lfgr vkVks fjDyksftax ds izko/kku

$\frac{1}{4},p\frac{1}{2}$ baLV^awesaV V^akalQkeZj dk fooj.k

3- ykbZfVax vjsLVlZ&rduhdh MkVk

4- lapkj %& dusD'ku ikbZaV@baVjQsl ikbZaV esa yxs vU; lapkj midj.k rFkk
ih,yhlh dk

fooj.k

5- csfld bUlwys'ku ysoy $\frac{1}{4}dsoh\frac{1}{2}$

$\frac{1}{4},\frac{1}{2}$ cl ckj

$\frac{1}{4}ch\frac{1}{2}$ Lohp xs;j

$\frac{1}{4}lh\frac{1}{2}$ V^akalQkeZj cqflax

$\frac{1}{4}Mh\frac{1}{2}$ V^akalQkeZj okbZfMax

IV- tujsfVax ;wfuV %

, - tujsfVax ;wfuV dk ekun.M %

1- fu/kkZfjr VfeZuy oksYVst $\frac{1}{4}dsoh\frac{1}{2}$

- 2- fu/kkZfjr ,eOgh,
- 3- fu/kkZfjr esxkokV
- 4- tujsVj dk buZfl;k dkUIVsUV ,p $\frac{1}{4}$ esxkokV lsd.M@,eoh, $\frac{1}{2}$
- 5- 'kkVZ lfdZV vuqikr
- 6- Mk;jsDV ,fDlI flaØksul fj,DVsal $\frac{1}{4}$,eoh, ds izfr'kr esa $\frac{1}{2}$ $\frac{1}{4}$ nksuks
vulspwjsVsM o lspwjsVsM $\frac{1}{2}$
- 7- Mk;jsDV ,fDlI V^akaft,UV fj,DVsal $\frac{1}{4}$,eoh, ds izfr'kr esa $\frac{1}{2}$ $\frac{1}{4}$ nksuks
vulspwjsVsM o lspwjsVsM $\frac{1}{2}$
- 8- Mk;jsDV ,fDlI lc&V^akaft,UV fj,DVsal $\frac{1}{4}$,eoh, ds izfr'kr esa $\frac{1}{2}$ $\frac{1}{4}$ nksuk
vulspwjsVsM o
lspwjsVsM $\frac{1}{2}$
- 9- DokMjspj ,fDlI flaØksul fj,DVsal $\frac{1}{4}$,eoh, ds izfr'kr esa $\frac{1}{2}$ $\frac{1}{4}$ nksuks
vulspwjsVsM o lspwjsVsM $\frac{1}{2}$
- 10- DokMjspj ,fDlI V^akaft,UV fj,DVsal $\frac{1}{4}$,eoh, ds izfr'kr esa $\frac{1}{2}$ $\frac{1}{4}$ nksuks
vulspwjsVsM o lspwjsVsM $\frac{1}{2}$
- 11- DokMjspj ,fDlI lc&V^akaft,UV fj,DVsal $\frac{1}{4}$,eoh, ds izfr'kr esa $\frac{1}{2}$ $\frac{1}{4}$ nksuks
vulspwjsVsM o
lspwjsVsM $\frac{1}{2}$
- 12- Mk;jsDV ,fDlI V^akaft,UV vksiu lfdZV le; dkaLVsaV $\frac{1}{4}$ lsdaM $\frac{1}{2}$
- 13- Mk;jsDV ,fDlI lc&V^akaft,UV vksiu lfdZV le; dkaLVsaV $\frac{1}{4}$ lsdaM $\frac{1}{2}$
- 14- DokMjspj ,fDlI V^akaft,UV vksiu lfdZV le; dkaLVsaV $\frac{1}{4}$ lsdaM $\frac{1}{2}$
- 15- DokMjspj ,fDlI lc&V^akaft,UV vksiu lfdZV le; dkaLVsaV $\frac{1}{4}$ lsdaM $\frac{1}{2}$
- 16- LVsVj jsftLVsal $\frac{1}{4}$ vkse $\frac{1}{2}$
- 17- LVsVj fydSt fj,DVsUl $\frac{1}{4}$ vkse $\frac{1}{2}$ Vh ,
- 18- LVsVj VkbZe dkaLVsaV $\frac{1}{4}$ lsdaM $\frac{1}{2}$
- 19- fu/kkZfjr QhYM djsaV $\frac{1}{4}$, $\frac{1}{2}$
- 20- ,DlkbZfVax djsaV nsrs gq, fofHkUu VfeZuy oksYVst ds fy, vksiu lfdZV
lspwjs'ku
djsDVfjLVd
- 21- tujsVj {kerk dOgZ
- 22- fu/kkZfjr LVsVj djsaV $\frac{1}{4}$, $\frac{1}{2}$
- 23- Qst dusD'ku
- 24- VfeZuYk czkV vkmV dh la[;k
- 25- fu/kkZfjr LihM $\frac{1}{4}$ vkjih,e $\frac{1}{2}$

- 26- fu/kkZfjr fQzDosalh $\frac{1}{4}gkVZt^{\frac{1}{2}}$
- 27- ,elhvkJ daMh'ku esa dq'kyrk izfr'kr
- 28- udkjkRed flDosal djsaV {kerk $\frac{1}{4}vkbZ_2Vh^{\frac{1}{2}}$
- 29- izfr Qst+ xzkm.M ls tujsVj LVsVj okbZfMax dk dsisflVsal $\frac{1}{4}ekbZ\emptyset ks$
QSjkMs esa $\frac{1}{2}$
- 30- 20 fMxzh lsfYl;l ij jksVj dk Mhlh jsftLVsal $\frac{1}{4}vkse$ esa $\frac{1}{2}$
- 31- thjks flDosal fj,DVsal ,Dl 0 $\frac{1}{4}\%^{\frac{1}{2}}$
- 32- udkjkRed flDosal fj,DVsal ,Dl 2 $\frac{1}{4}\%^{\frac{1}{2}}$
- 33- udkjkRed flDosal jftLVsUl vkj 2 $\frac{1}{4}\%^{\frac{1}{2}}$
- 34- lc&V^akaft,UV ,l&lh $\frac{1}{4}'kkVZlfdZV^{\frac{1}{2}}$ le; dkaLVsaV $\frac{1}{4}lsdaM$ esa $\frac{1}{2}$
, $\frac{1}{2}$ Mk;jsDV ,fDl Vh^{^^} Mh
ch $\frac{1}{2}$ DokMjspj ,fDl Vh^{^^} D;w
- 35- V^akaft,UV ,l&lh $\frac{1}{4}'kkVZlfdZV^{\frac{1}{2}}$ le; dkaLVsaV $\frac{1}{4}lsdaM$ esa $\frac{1}{2}$
, $\frac{1}{2}$ Mk;jsDV ,fDl Vh[^] Mh
ch $\frac{1}{2}$ DokMjspj ,fDl Vh[^] D;w
- 36- e'khu lspwjs'ku 1-0 ih;w oksYVst ij ih;w esa
- 37- e'khu lspwjs'ku 1-2 ih;w oksYVst ij ih;w esa
- 38- izfr'kr jsX;wys'ku
- 39 'kkVZ lfdZV djsDVfjLVd dOgZ
chchchch- $\frac{1}{2}$,DlkbZVs'ku fu;a=.k iz.kkyh dk ekun.M %
- 1- ,DlkbZVs'ku dk izdkj
- 2- vf/kdre QhYM oksYVst
- 3- U;wure QhYM oksYVst
- 4- fu/kkZfjr QhYM oksYVst
- 5- xSu QSDVj
- 6- QhM csd LVs^aUXFk
- 7- daV^aksy ,EiyhQk;j ds fy, VkbZe dkaLVsaV
- 8- ,DlkbZVj ds fy, VkbZe dkaLVsaV
- 9- QhM csd ds fy, VkbZe dkaLVsaV
- 10- daV^aksy ,EiyhQk;j dk vkmViqV oksYVst
- 11- daV^aksy ,EiyhQk;j dk vf/kdre vkmViqV oksYVst
- 12- daV^aksy ,EiyhQk;j dk U;wure vkmViqV oksYVst

- 13- lsV OksY;w lfgr vkbZ bZbZbZ izfrd mi;ksx djrs gq, bufMohTkqvy ,fyesaV ds V^akalQkeZj dks
ns[krs gq, Cykd MkbZxzke esa ,DlkbZVs'ku ywi dk fooj.kA
- 14- vksOgj&,DlkbZvVS'ku fyfeVj dk Mk;usfed xq.k
- 15- v..Mj&,DlkbZvVS'ku fyfeVj dk Mk;usfed xq.k
- 16- ,DlkbZVj vkbZ bZbZbZ ekMy@Vkbi la0
- 17- ,DlkbZVj fjlikUl le;
- lh- xozuj@Vjckbu ds ekunaM %
- 1- xozuj vkSlr xSu $\frac{1}{4}$ esxkokV@gkVZt $\frac{1}{2}$
- 2- LihMj eksVj lsfVax jsat
- 3- ok'i vFkok bZa/ku xozuj okYo dk VkbZe dkaLVsaV
- 4- xozuj okYo vksiuhax fyfeV~l
- 5- xozuj okYo jsV fyfeV~l
- 6- VjckbZu $\frac{1}{4}$,pih] vkbZih] ,yih $\frac{1}{2}$ dk VkbZe dkaLVsaV
- 7 lsV okYo lfgr vkbZ bZbZbZ izrhd mi;ksx djrs gq, bufMohtoy ,fyesaV dk V^akalQkeZj
QaD'ku fn[kkus okyk xozuj Cykd Mk;xzke
- 8 xouZj dk izdkj] D;k vkbZ bZbZbZ ekud xouZj mi;ksx gqvk gS\
- 9- jsX;wys'ku ,.M M^awi
- 10- QzsD'ku vkQ VksVy ikoj tujsVsM ,pih] vkbZih] ,yih VjckbZu
- 11- vf/kdre osyksflVh lhek ,pih] vkbZih] ,yih VjckbZu
- 12 U;wure osyksflVh lhek ,pih] vkbZih] ,yih VjckbZu
MhMhMhMh- izpkyuh; ekun.M
- 1- fM&flaØksukbZts'ku ls tujsfVax ;wfuV flaØksukbZftax gsrq visf{kr U;wure ukssfVl
- 2- tujsfVax dsUnz esa fMQjsUV tujsfVax ;wfuV ds e/; flaØksukbZftax djus ds fy, U;wure
vko';d le;
- 3- flaØksukbZftax ij U;wure Cykd yksM vko';drk
- 4- fuEu n'kkvksa ds fy, tujsfVax ;wfuV dks flaØksukbZftax djus ds fy, visf{kr le; %
 $\frac{1}{2}$ gkWV
ch $\frac{1}{2}$ okeZ
lh $\frac{1}{2}$ dksYM

5- fuEu n'kkvksa esa tujsfVax ;wfuV dk vf/kdre yksfMax nj%

, $\frac{1}{2}$ gkV

ch $\frac{1}{2}$ okeZ

lh $\frac{1}{2}$ dksYM

6- fcuk vkW;y liksVZ U;wure Hkkj $\frac{1}{4}$ esxkokV $\frac{1}{2}$

5- la;a= fu"iknu

1-nSfud ekax izksQkbZy $\frac{1}{4}$ foxr o"kZ $\frac{1}{2}$	iwjs fnu Hkj izfr vk/kk ?kaVk ,dhd`r ekax
2-;wfuV tujsVsM $\frac{1}{4}$ fefy;u ds-MCY;w-,p-esa $\frac{1}{2}$	
3-vkfDtyjh;wfuV [kir $\frac{1}{4}$ fefy;u ds-MCY;w-,p-	
4-lgk;d Hkkj dks iz.kkyh ls ;wfuV vkiwfrZ	
5-lhtuy tujs'ku	

, -1-3 gkbM^aks bysfDV^ad lkekU; %

1- LFky	ekxZ] jsyykbZu] V ^a kaleh'ku ykbZu] unh] tyk'k; $\frac{1}{4}$;fn dksbZ gks $\frac{1}{2}$ iznf'kZr djus okyk $\frac{1}{4}$ fLdesfVd $\frac{1}{2}$ yksds'ku uD'kk
D;k LVksjst VkbZi] ju vkWQ fjoj VkbZi	
iw.kZ tyk'k; Lrj	
Vsy jsl Lrj	
fMtkbZu gsM	
U;wure M ^a k Mkmu Lrj	
tyk'k; Lrj oh@,l ,uthZ iksVsufly doZ	
2- fuekZ.k dh vuqekfur vof/k	
3- okf'kZd mRiknu $\frac{1}{4}$ fefy;u ds-MCY;w-,p-	

II- dusD'ku

$\frac{1}{4}$ tSls Åij fyf[kr FkeZy tujsfVax dsUnz ij ykxw $\frac{1}{2}$

III- dsUnz {kerk

$\frac{1}{4}$ tSls Åij fyf[kr FkeZy tujsfVax dsUnz ij ykxw $\frac{1}{2}$

IV- tujs'ku ;wfuV MkVk

1- vkijsfVax gsM	
$\frac{1}{4}$, $\frac{1}{2}$ vf/kdre	
$\frac{1}{4}$ Ckh $\frac{1}{2}$ U;wure	
$\frac{1}{4}$ Lkh $\frac{1}{2}$ vkSlr	
gkbZM ^a ks ;wfuV	
, $\frac{1}{2}$ flaØksul daMsulj ds :i esa izpkyu djus dh {kerk	
ch $\frac{1}{2}$ $\frac{1}{4}$ iw.kZ o vkaf'kd Hkkj esa $\frac{1}{2}$ okVj gsM cuke	

lh ^{1/2} flaØksul daMsulj ds :i esa izpkYu djrs le;vko';d ikoj vFkok okVj fMLpktZ dh vko';drk	
2- VjckbZu	
VkbZi] {kerk	
3- tujsVj	
, ^{1/2} esd o izdkj	
ch ^{1/2} jsfVax ^{1/4} ,eoh, ^{1/2}	
lh ^{1/2} VfeZuy oksYVst ^{1/4} ds-Ogh- ^{1/2}	
Mh ^{1/2} fu/kkZfjr ikoj QsDVj	
bZ ^{1/2} 0-95 yhfMax rFkk 0-85 ySfxax jsat esa izfrfØ;k'khy ikoj {kerk	
,Q ^{1/2} 'kkVZ lfdZVvuqikr	
th ^{1/2} Mk;jsDV ,fDl V ^a kaft,UV fj,DVsal ^{1/4} ,eoh, jsfVax ij	
,p ^{1/2} Mk;jsDV ,fDl lc&V ^a kaft,UV fj,DVsal ^{1/4} ,eoh, jsfVax ij izfr'kr ^{1/2}	
vkbZ ^{1/2} lgk;d ikojdhvko';drk	
4- tujsVj V ^a kalQkeZj	
, ^{1/2} izdkj	
ch ^{1/2} fu/kkZfjr {kerk ^{1/4} ,eoh, ^{1/2}	
Lkh ^{1/2} oksYVst vuqikr ^{1/4} ,poh@,yoh ^{1/2}	
Mh ^{1/2} Vsi psat jsat ^{1/4} \$% ls &% ^{1/2}	
bZ ^{1/2} izfr'kr bfEiMsUl ^{1/4} Qwy yksM ij ikftfVo fIDosal ^{1/2}	

, -1-4 gkbZM^aksbysfDV^ad dsUnz %

1- lkekU; %

1 tujsfVax dsUnz dk uke %

2- tujsfVax ;wfuV dh {kerk o la[k;k ^{1/4}esxk- esa^{1/2} %

3- tujs'ku ;wfuV ^{1/4},e;w^{1/2} dk visf{kr Lrj

4- izfro"kZ tujs'ku dh vof/k ^{1/4}ekg esa^{1/2}

5- flapkbZ iz;kstu ds fy, cka/k@ugj ls NksM+s x;s ikuh ij D;k la;a= vk/kkfjr gS\

6- lHkh estj midj.k dh jsfVax

7- tujsfVax dsUnz rFkk Lohp ;kMZ dk flaxy ykbZu Mk;xzke

8- fjysbZax o ehVfjax Mk;xzke

9- tujsVj dk U;wV^ay xzkmf.Max

10- ,DlkbZVs'ku fu;a=.k

11- vFkZ jsftLVsal osY;w lfgr vfFkZax O;oLFkk

- 12- lapkj&ih,yhlh rFkk LFkkfir vU; lapkj midj.k dk C;kSjk
- II- lqj {kk ¼izksVsD'ku½
¼tSls Åij fyf[kr FkeZy tujsfVax dsUnz ij ykxw½
- III- Lohp ;kMZ
¼tSls Åij fyf[kr FkeZy tujsfVax dsUnz ij ykxw ½
- IV- tujs'ku ;wfuV %
,- tujs'ku ;wfuV dk ekun.M
¼tSls Åij fyf[kr FkeZy tujsfVax dsUnz ij ykxw½
- chchchch- ,DlkbZVs'ku fu;a=.k iz.kkyh dk ekun.M
¼tSls Åij fyf[kr FkeZy tujsfVax dsUnz ij ykxw½
- lh- xouZj @VjckbZu dk ekun.M
¼tSls Åij fyf[kr FkeZy tujsfVax dsUnz ij ykxw½
- MhMhMhMh- izpkyuh; ekun.M
- 1- tujsfVax ;wfuV dks fM&flaØksukbZts'ku ls flaØksukbZftax gsrq U;wure uksfVl visf{kr
- 2- tujsfVax dsUnz esa fofHkUu tujsfVax ;wfuV ds e/; flaØksukbZftax gsrq U;wure le;
- 3- flaØksukbZftax dk visf{kr U;wure Cykd yksM
FkeZy tujsfVax dsUnz ds fy, % ,lVh;w dh bPNk ij
- I- dusD'ku %
- 1- V^akaleh'ku iz.kkyh ds lkFk lkekukarj izpkyu ds v/;;u dh fjiksVZ %
,½ yksM ¶yks v/;;u
ch½ LFkkf;Ro v/;;u
lh½ 'kkVZ lfdZV v/;;u
- 2- V^akaleh'ku iz.kkyh ds lkFk izLrkfor dusD'ku
,½ oksYVst
ch½ lfdZV dh la[;k
lh½ dusD'ku dh ikbZaV @ baVjQsl ikbZaV
- II- gkbZM^aksbysfDV^ad mRiknu dsUnz
¼tSls Åij fyf[kr FkeZy tujsfVax dsUnz ij ykxw½
Hkkx&2&forj.k
¼forj.k daiuh }kjk jkT; ikjs" k.k miØe dks izLrq djus
gsrq½

&1 ekunaM Iykfuax MkVk forj.k

I- lkekU; %

1- flaxy ykbZu Mk;xzke 33 dsoh midsUnz rd
ykbZlsalh okj

2- miHkksDrk MkVk forj.k ykbZlsalh ds loksZÙke fu.kZ;
ds vk/kkj ij miHkksDrk dh Js.khokj
muds dusDVsM yksM layXu djsaA

3- forj.k ds orZeku IHkh
izHkkjh vf/kdkjh dk
lanHkZ

II- la;kstu $\frac{1}{4}$ dusD'ku $\frac{1}{2}$ %

1-dusD'ku ikbZaV@baViOsl
dusD'ku ikbZaV@baVjQsl
ikbZaV

crkus okyk flaxy ykbZu Mk;xzke
layXu djsa

2- dusD'ku ikbZaV@baVjQsl
ikbZaV ij
oksYVst

3- dusD'ku ikbZaV@baVjQsl
ikbZaV QhM
djus okys fxzM midsUnz ds uke

III- ykbZu o midsUnz %

1- ykbZu MkVk ykbZu dh yackbZ rFkk
izLrqr djsA

2- midsUnz MkVk midsUnz esa LFkkfir 220@132
132@33dsOh] 33@11dsOh]
ds V^akalQkeZj rFkk
dsisflVj dk fooj.k layXu djsaA

IV- Hkkj

1- dusD'ku ikbZaV@baVjQsl ikbZaV ij yksM M ^a ku	dkEisDV ,fj;k tks fjax esa baVjdusDVsM gS] esa ;fn forj.k ykbZlsalh dbZ dusD'ku ikbZaV ij ikoj izklr djrk gS] rc ,slk forj.k ykbZlsalh] ,IVh;w ds lkFk ijLij ;Fkk ppkZ rFkk lgefr osfj,'ku vFkok Vkyjsal ds lkFk izR;sd dusD'ku ikbZaV ij vkiwfrZ ds vksOgj ~~vkWw ,fks= ds fv M^aku vksOgi vky vksM~~
2- bZ,poh esafn, tkus okys yksM dk fooj.k] ;fn dksbZ gks	fxM midsUnz ls miHkksDrk iflj rd bZ,pVh ykbZu dh M ^a ku yackbZ ls fxzM midsUnz dk uke rFkk miHkksDrk oksYVst vkiwfrZ]

v- ekax MkVk $\frac{1}{45}$ esxkokV rFkk mlls Åij] IHkh Hkkj gsrq $\frac{1}{2}$ %

1- ,pih vFkok dsMCyw esa yksM o jsfVax dk izdkj	crkos] ;fn QusZl Qkj] jksfyax fey] Vs ^a D'ku Hkkj] vU; vkS ksfxd Hkkj] ifEiax Hkkj vkfn gksA
2- fu/kkZfjr oksYVst	
3- midj.k dk fo qr Hkkj	crkos eksVj dk vkdkj o la[;k] jsfVax vFkok vkØ QusZalsl@baMD'ku QusZl] M ^a kbZo rFkk fu;a=.k O;oLFkk dk izdkj
4- vkiwfrZ fQzDosalh rFkk oksYVst dks yksM lsFULkfoVh	
5- yksM dk vf/kdre gkeksZfud	
6-yksM dk vkSlr rFkk vf/kdre Qst vucsysUl	
7- fudVre midsUnz tgka ls yksM dks QhM fd;k tkuk gSA	
8- eki ds vuqlkj yksds'ku uD'kk	midsUnz ds vklikl ykbZu ds lanHkZ esa yksM dk fBdkuk fn[kkus okyk uD'kk

VI Hkkj iwokZuqeku MkVk %

- 1- dusD'ku ikbZaV@baVjQsl ikbZaV ds fy, ihd yksM oSls gh vkus okys ckn izR;sd o"kZ ds fy, {ks= dh vkiwfrZ ds fy, ,uthZ rFkk ihd yksM iwokZuqeku A
- 2- esFkkMkykth rFkk /kkj.kk dk fooj.k ftl ij iwokZuqeku vk/kkfjr gSA
- 3- 5 esxkokV rFkk mlls Åij Hkkj dk fooj.k %
 $\frac{1}{2}$ Hkkoh miHkksDrk dk uke
 $\frac{1}{2}$ yksM Qsftax
ch&2 foLr`r Iykfuax MkVk $\frac{1}{4}$ forj.k $\frac{1}{2}$

I- lkekU;%

- 1- forj.k iz.kkyl $\frac{1}{4}$ V^akaleh'ku iz.kkyl ls ;fn izR; {k QhM dUT;wej cl dks fd;k x;k] rks
V^akaleh'ku iz.kkyl 220@132dsoh] 132@33dsoh] o 33@11dsoh midsUnzksa ds lkFk dusD'ku
ikbZaV@baVjQsl ikbZaV ls forj.k ykbZu crkus okys $\frac{1}{2}$ dk fLdesfVd flaxy ykbZu Mk;xzkeA
- 2- $\frac{1}{4}$ V^akaleh'ku iz.kkyl rFkk lacaf/kr 220@132dsoh] 132@33dsoh] o 33@11dsoh midsUnz ds
fxzM midsUnzksa dks QhfmMax lfgr vfHkKkfir $\frac{1}{2}$ ykbZu rFkk midsUnzksa ds uEcj yxkuk rFkk
ukedj.k A

II- la;kstu $\frac{1}{4}$ dusD'ku $\frac{1}{2}$

- 1- dusD'ku ikbZaV@baVjQsl ikbZaV $\frac{1}{4}$ dusD'ku ds fo|rku O;oLFkk dk fooj.k layXu djsa $\frac{1}{2}$

2- dusD'ku ikbZaV@baVjQsl ikbZaV dh ehVfjax dk fooj.k

ch&3 foLr`r Iykfuax MkVk $\frac{1}{4}$ forj.k $\frac{1}{2}$

$\frac{1}{4}$ jkT; ikjs"k.k miØe ds vuqjks/k ij izLrqfr ds fy, $\frac{1}{2}$

I- dusD'ku %

1- dusD'ku ikbZaV@baVjQsl ikbZaV fuEufyf[kr ds fy, ;Fkk iz;ksT; %

, $\frac{1}{2}$ u;k

ch $\frac{1}{2}$ fo|eku dusD'ku dk mUu;u

2- dusD'ku ikbZaV@baVjQsl ikbZaV esa ehVfjax esa ifjorZu

II- Hkkj %

1- vkxkeh 10 o"kksZa ds fy, lafonkd`r ,d esxkokV rFkk mls vf/kd ds estj Hkkj dk fooj.kA

ifjfk"V&[k

foLr`r V^akaleh'ku iz.kkyh MkVk $\frac{1}{4}$ vuqPNsn 3-5 $\frac{1}{2}$ 5 $\frac{1}{2}$ 5 $\frac{1}{2}$ 5 $\frac{1}{2}$

$\frac{1}{4}$ jkT; ikjs"k.k miØe@ikjs"k.k vuqKflr/kkj dh ds vuqjks/k ij jkT;karfjd mi;ksxdrkZ dks iznku djus gsrq $\frac{1}{2}$

ch&1 ekunaM Iykfuax MkVk $\frac{1}{4}$ V^akaleh'ku

1- ykbZu dk uke $\frac{1}{4}$ mRiknu dsUnz rFkk dusDV gksus okys midsUnz crkus okyk $\frac{1}{2}$

2- ykbZu oksYVst $\frac{1}{4}$ dsoh $\frac{1}{2}$

3- lfdZV dh la[;k

4- :V yackbZ $\frac{1}{4}$ lfdZV fd-eh- $\frac{1}{2}$

5- daMDVj lkbZTk

6- ykbZu ekun.M $\frac{1}{4}$ 100 ,eoh, csl ij ih;w ;k vkse esa $\frac{1}{2}$ jsftLVsal@fd-eh-] buMfDVo fj,DVsal@fd-eh-]

IIIVsal@fd-eh- 7-

vuqekfur ikoj ¶yks esxkokV rFkk ,eoh,vkj 8- ykbZu :V

$\frac{1}{4}$ VksiksxxkfQd 'khV $\frac{1}{2}$

9- dusD'ku dk iz;ksT; % Ldhe lanHkZ] vU; jkT; dks

Oghfyax vkfn 10- vuqekfur fuekZ.k vof/k

ch&2 foLr`r iz.kkyh MkVk $\frac{1}{4}$ V^akaleh'ku $\frac{1}{2}$

I- lkekU; %

1-fxzM midsUnz ij 33dsoh rd V^akaleh'ku iz.kkyh dk flaxy ykbZfuax

Mk;xzke 2-midsUnz dk uke

3-mRiknu dsUnz dusDV sM

4-lfdZV dh la[;k o yackbZ

5-baVjdusfDaVx V^akalQkeZj

6-midsUnz cl ysvkmV

7-ikoj V^akalQkeZj

8-izfrfØ;k'khy dEiulslu midj.k

$\frac{1}{4}i\frac{1}{2}$ LFkkfir dsisflVj dk fooj.k

$\frac{1}{4}ii\frac{1}{2}$ vfrfjDr Hkkj ds lkFk pkyw gksus okyk vfrfjDr
dsisflVj 9-ykbZVfuax vjsLVj
10-cl rFkk@vFkok ykbZu fj,DVj

II- midsUnz ys vkmV fn[kkus okys
Mk;xzke %

1-cl ckj ysvkmVt+
2-fo|qr lfdZV^h] ykbZu] dscy] V^akalQkeZj] Lohpxs;j
vkfn 3-Qsftax O;oLFkk
4-vfFkZax O;oLFkk
5-Lohfpax lqfo/kk,sa RkFkk baVjykfdx O;oLFkk
6-vkijsfVax oksYVst
7-uacj yxkuk rFkk ukedj.k

$\frac{1}{4}i\frac{1}{2}$ V^akalQkeZj

$\frac{1}{4}ii\frac{1}{2}$ lfdZV

$\frac{1}{4}iii\frac{1}{2}$ lfdZV czsØj

$\frac{1}{4}iv\frac{1}{2}$ vkbZlksysfVax Lohp

III- ykbZu ekun.M $\frac{1}{4}IHkh$

1-ykbZu dk uke
2-ykbZu dh yackbZ $\frac{1}{4}fdyksehVj\frac{1}{2}$
3- lfdZV dh la[;k] daMDVj dk lkbZt o izdkj] FkeZy
jsfVax 4- izfr lfdZV osY;w
 $\frac{1}{4}i\frac{1}{2}$ vkijsfVax oksYVst $\frac{1}{4}dsogh\frac{1}{2}$

IV-

$\frac{1}{4}ii\frac{1}{2}$ ikftVho Qst flDosal fj,DVsl & vkse izfr fd-eh-

$\frac{1}{4}iii\frac{1}{2}$ ikftVho Qst flDosal jsftLVsal & vkse izfr fd-eh-

$\frac{1}{4}iv\frac{1}{2}$ ikftVho Qst flDosal llsIVsal & vkse izfr fd-eh-

$\frac{1}{4}v\frac{1}{2}$ thjks Qst flDosal fj,DVsl & vkse izfr fd-eh-

$\frac{1}{4}vi\frac{1}{2}$ thjks Qst flDosal jsftLVsal & vkse izfr fd-eh-

$\frac{1}{4}vii\frac{1}{2}$ thjks Qst flDosal llsIVsal & vks,p,e,l izfr fd-eh-

V^akalQkeZj ekun.M $\frac{1}{4}iSjkehVj\frac{1}{2}$

$\frac{1}{4}$ midsUnzokj IHkh V^akalQkeZj ds fy, $\frac{1}{2}\%$

- 1- fu/kkZfjr ,eoh,
- 2- oksYVst vuqikr
- 3- osDVj lewg

- 4- fu/kkZfjr ,eoh, csl ij vf/kdre] U;wure o lkekU; ikftVho flDosal fj,DVsal
- 5- fu/kkZfjr ,eoh, csl ij vf/kdre] U;wure o lkekU; ikftVho flDosal jsftLVsal
- 6- fu/kkZfjr ,eoh, csl ij thjks flDosal fj,DVsal
- 7- VSi ifjorZu jsUt $\frac{1}{4} + \%$ ls - $\% \frac{1}{2}$ RkFkk LVsi
- 8- VSi psatj $\frac{1}{4}$ vkQ@vku $\frac{1}{2}$ dk fooj.k
- 9- U;wV^ay xzkmf.Max V^akalQkeZj@jsftLVj osY;w
- 10- $\%$ bfEiMsUl vf/kdre@U;wure@ lkekU; VSi ij
- v- midj.k fooj.k $\frac{1}{4}$ lHkh midsUnzksa ds fy, $\frac{1}{2} \%$
 - 1- lfdZV cszdj
 - 2- vkbZlksysfVax Lohp
 - 3- djsaV V^akalQkeZj
 - 4- iksVsufly V^akalQkEkZj
 - 5- ykbZVfuax vjsLVj
 - 6- vfFkZax Lohp
- VI- fjysbZax o ehVfjax $\%$
 - 1-vU; mi;ksxdrkZ ds lkFk leUo;u ls mids lsfVax rFkk Lrj ds lkFk lHkh V^akalQkeZj
rFkk QhMj ds fy, LFkkfir fjys lqj{kk
 - 2-ehVfjax fooj.k
- VII- iz.kkyyh v/;;u
 - 1-yksM ¶jyks v/;;u $\frac{1}{4}$ vf/kdre gkbZM^aks rFkk vf/kdre FkeZy tujs'ku ds fy, ihd o yhau
yksM $\frac{1}{2}$
 - 2-fØfVdy ykbZu esa 3 Qst QkYV rFkk 400dsoh ykbZu rFkk fØfVdy 220dsoh ykbZu ds
fy, flaxy iksy fjDyksftax ds fy, V^akaft,UV LFkkf;Ro v/;;uA
 - 3-Mk;usfed LFkkf;Ro v/;;u
 - 4-'kkVZ lfdZV v/;;u $\frac{1}{43}$ Qst rFkk flaxy Qst vFkZ $\frac{1}{2}$
 - 5-iz.kkyyh esa V^akaleh'ku o forj.k {kfr
ekax MkVk $\frac{1}{4}$ lHkh midsUnzksa ds fy, $\frac{1}{2} \%$
 - 1- ekax izksQkbZy $\frac{1}{4}$ ihd o vkWQ ihd yksM $\frac{1}{2}$
 - 2- vkxkeh 5 o"kksZa ds fy, iwokZuqeku
- IX- izfrfØ;k'khy {kfriwfrZ midj.k $\%$
 - 1- midj.k dk izdkj $\frac{1}{4}$ fQDLM vFkok osfj;scy $\frac{1}{2}$

legally enforceable, interface document agreed upon and to be complied with by all entities connected to the state transmission system. The Grid Code has been designed to ensure an efficient and coordinated State transmission system and allow State transmission utility (STU) to comply with its obligations in relation to the intra state as well as interstate (wherever applicable) transmission of power.

1.2 Short title, extent and commencement

1. These Regulations shall be called “Chhattisgarh State Electricity Grid Code, 2011” or “State Grid Code-2011”.
2. These Regulations shall extend to the whole of Chhattisgarh.
3. These Regulations shall come into force from the date of its publication in the Chhattisgarh Rajpatra

1.3 Definitions

In these Regulations unless the context otherwise requires:

1. **"Act"** means the Electricity Act 2003 (36 of Act 2003), including amendments thereto;
2. **"Active Energy"** means the electrical energy produced, flowing or supplied by an electrical circuit during a time interval, and being the integral of the instantaneous power with respect to time, measured in units of watt hours or standard multiples thereof:
 $1,000 \text{ Wh} = 1 \text{ kWh} = 1 \text{ Unit}, 1,000 \text{ kWh} = 1 \text{ MWh}, 1,000 \text{ MWh} = 1 \text{ GWh} = 1 \text{ MU}$
 (Million Units)
3. **"Active Power"** means the product of voltage and the in-phase component of alternating current measured in units of watts and standard multiples thereof :
 $1,000 \text{ W} = 1 \text{ kW}, 1,000 \text{ kW} = 1 \text{ MW}, 1,000 \text{ MW} = 1 \text{ GW}$
4. **"Apparent Power"** means the product of voltage and current measured in units of volt amperes and standard multiples thereof, which is:
 $1,000 \text{ VA} = 1 \text{ kVA}, 1,000 \text{ kVA} = 1 \text{ MVA}, 1,000 \text{ MVA} = 1 \text{ GVA}$
5. **"Apparent Energy"** means the integral of the apparent power with respect to time. It is measured in Volt Ampere hour and standard multiple thereof, which is:
 $1,000 \text{ VAh} = 1 \text{ kVAh}, 1,000 \text{ kVAh} = 1 \text{ MVAh}, 1,000 \text{ MVAh} = 1 \text{ GVAh}$
6. **"Apparatus"** means the electrical apparatus and includes all machines, fittings, accessories and appliances in which conductors are used.
7. **"Authority"** means the Central Electricity Authority referred to in sub-section (1) of Section 70 of the Act.
8. **"Automatic Voltage Regulator "(AVR) "** means a continuously acting automatic excitation system to control the voltage of a generating unit as measured at the generator terminals;
9. **"Backing Down"** means the instructions of SLDC or WRLDC conveyed through SLDC, for reduction of generation of a generating unit under abnormal conditions such as high frequency, low system demand or network constraints;
10. **"Beneficiary"** means a person buying power from SGS,ISGS,InSGS using STU and/or CTU and/or transmission licensees network and who have Transmission Service Agreement with the STU /Transmission Licensee/CTU.
11. **"Black Start Procedure"** means the procedure necessary to recover the grid from a partial or total blackout;
12. **"Breakdown" "** means an occurrence relating to equipment of supply system

- which prevents its normal functioning;
13. **"Bulk consumer"** means a consumer who avails supply at voltage of 33 KV and above through open access;
 14. **"Central Electricity Regulatory Commission" or "Central Commission"** means the Commission set up under Section 76 of the Act;
 15. **"Central Transmission Utility" or "CTU"** means any Government company which the Central Government may notify as such under sub-section(1) of section 38;
 16. **"Commission" or "CSERC"** means the Chhattisgarh State Electricity Regulatory Commission;
 17. **"Connectionpoint"** means a point at which a user's and/or generating plants apparatus are connected to the intra-State transmission system;
 18. **"Connection Agreement"** means an agreement between STU, intra-state transmission licensee other than STU (if any) and any person setting out terms related to a connection to and / or use of intra-state transmission system.
 19. **"Control Area Customers" (CAC)** means "A generating station connected to ISTS or connected with ISTS and the State network (both)" and whose any of the activity of real time monitoring, scheduling, dispatch control, energy accounting etc are executed by SLDC as per the provisions of the IEGC.
 20. **"CSPTCL"** means Chhattisgarh State Power Transmission Company Limited acting as State Transmission Utility (STU).
 21. **"Demand"** means the demand of active power in MW, reactive power in MVAR and apparent power in MVA of electricity unless otherwise stated;
 22. **"Data Acquisition System"** means a system provided to record the sequence of operation in time, of the relays/equipments as well as the measurement of pre selected parameters;
 23. **"Df/dt Relay"** means a relay which operates when the rate of change of system frequency (over time) goes higher than a specified limit and initiates load shedding ;
 24. **"Dispatch Instructions"** means an instruction by SLDC to SGS, InSGS to dispatch generation and to distribution licensee/bulk consumers/ to regulate drawal in accordance with the Scheduling & Dispatch procedure of Grid Code;
 25. **"Distribution Company (Discom) or Distribution licensee"** means a company engaged primarily in the business of distribution and supply of electricity in its area of supply and licensed to do so under Section 12 of the Act;
 26. **"Distribution System"** means the system of wires and associated facilities between the delivery points on the transmission lines or the generating station connection as the case may be and the point of connection to the installation of the consumers.

27. **"Despatch Schedule"** means a State Generating Station / InSGS scheduled to be exported to the grid from time to time.
28. **"Drawal Schedule"** means the submission of the station-wise ex-power plant drawal schedules from SGS / InSGS and drawal from state grid consequent to intra-State open access transaction.
29. **"Disturbance Recorder "** means a device provided to record the behavior of the pre-selected digital and analog values of the system parameters during an events;
30. **"Drawal"** means the electricity taken out from the intra state transmission system.
31. **"Event"** means a unscheduled or unplanned occurrence in the intra State Transmission system including faults, incidents and breakdowns;
32. **"Event logging facility"** means a device provided to record the chronological sequence of operations, of the relays and other equipments;
33. **"Extra High Tension (EHT)" or "Extra High Voltage (EHV)"** means voltage higher than 33kV;
34. **"Fault Locator"** means a device provided at the end of a transmission line to measure/indicate the distance at which a line fault may have occurred.
35. **"Flexible Alternating Current Transmission (FACT)"** means facilities that enable power flow of A.C lines to be regulated, to control loop flows, line loading etc.;
36. **"Generating Plant"** means a generating station which shall include a captive generating plant (CGP) connected to state grid and includes a generation plant /CGP coming under the control area of SLDC as per provision of IEGS;
37. **"Grid Code"** means "Chhattisgarh State Electricity Grid Code - 2011".
38. **"High Tension (HT)" or "High Voltage (HV)"** means voltage higher than 650V but which does not exceeds 33 kV under normal conditions.
39. **"Indian Electricity Grid Code" or "IEGC"** means the central grid code specified by the Central Commission in accordance with sub section 1(h) of Section 79 of the Act.
40. **"Inter-State Generation Station" or "ISGS"** means a Central generating station or other generation station in which two or more states have shares;
41. **"Intra State generating Station" or "InSGS"** means any generating station including Captive generating plant (CGP) which is only connected to State grid;
42. **"Intra State Transmission System" or "State Transmission System" or "InSTS" or "State grid"** means any system for conveyance of electricity by transmission lines within the area of the state and includes all transmission lines, sub-stations and associated equipment of transmission licensee of the state;
43. **"Intra-State user"** means a person such as a generating company including captive generating plant or transmission licensee (other than CTU and STU) or

- distribution licensee or bulk consumer including captive user whose electrical plant is connected to the State grid at voltage level of 33 KV and above.
44. **"Low Tension" or "Low Voltage"** means voltage 650 Volt and below.
45. **"Maximum Continuous Rating" (MCR)** means the normal rated full load MW output capacity of a generating unit, which can be sustained on a continuous basis at specified conditions;
46. **"Maximum demand"** means the 4 times maximum value of average KVA delivered to consumers at the point of supply during any consecutive period of 15 minutes during the month computed on either block interval or sliding window principle of measurement.
47. **"Operation"** means a schedule or plan action related to the operation of a system;
48. **"Open Access Regulation"** means the Chhattisgarh State Electricity Regulatory Commission (Connectivity and Intra State Open Access) Regulation, 2011.
49. **"Peak Period"** means the period in a day when demand for electricity is at its highest or as directed by the Commission.
50. **"Planned Outage"** in relation to all InSGS unit means outage of power generating units and in relation to transmission facility means outage of transmission lines and equipments, which have been planed and agreed with SLDC in advance, during a year;
51. **"Reactive Energy"** means the integral of the Reactive Power with respect to time. It is measured in volt amperes reactive hours and standard multiple thereof, that is:
- $$1,000 \text{ VArh} = 1 \text{ kVArh}, 1,000 \text{ kVArh} = 1 \text{ MVArh}, 1,000 \text{ MVArh} = 1 \text{ GVarh}$$
52. **"Reactive Power"** means the product of voltage and current and the sine of the phase angle between them measured in units of volt amperes reactive and standard multiples thereof, that is:
- $$1,000 \text{ VAr} = 1 \text{ kVAr}, 1,000 \text{ kVAr} = 1 \text{ MVAr}, 1,000 \text{ MVAr} = 1 \text{ GVar}$$
53. **"Single Line Diagram"** means diagrams which are a schematic representation of the HV/EHV apparatus and the connections to all external circuits at a connection point incorporating its numbering nomenclature and labeling;
54. **"Site Common Drawing"** means drawings prepared for each connection point, which incorporates layout drawings, electrical layout drawings, common protection/control drawings and common service drawings;
55. **"Spinning Reserve"** means the reserve capacity of a generating station which is partially loaded, synchronized to the system and is ready to provide increased generation at short notice pursuant to dispatch instruction, or instantaneously in response to a frequency drop;
56. **"State Load Despatch Centre" or "SLDC"** means the centre established under

sub-section (1) of section 39.

57. **"State Sub-Load Despatch Centre" or "SSLDC"** means the offices and associated facilities of the State Load Despatch centre set up at places other than the location of the SLDC for monitoring and control of the State grid;
58. **"State Generating Station" or "SGS"** means any the generating stations owned by the companies owned or controlled by the State Government;
59. **"State Transmission Utility" or "STU"** means the Government Company specified as such by State Government under sub-section (1) of Section 39 of the Act.
60. **"Static VAR Compensator"** means an electrical facility designed for the purpose of generating or absorbing Reactive Power;
61. **"Supervisory Control and Data Acquisition" or "SCADA"** means the combination of transducers, remote terminal unit communication links and data processing systems which provides information to the SLDC on the operational state of the State transmission system;
62. **"Synchronize"** means the condition where an incoming generating unit or system is connected to another system so that the voltage, frequencies and phase relationships of that generating unit or system, as the case may be, and the system to which it is connected are identical and the terms "synchronize" and "synchronization" shall be construed accordingly.
63. **"Time block"** block of 15.00 minutes during which energy meter records specified electrical parameters. For recording of MD in MW or MVA the measurement during the time block may be either on block interval or on sliding window principle.
64. **"Under Frequency Relay"** means a relay which operates when the system frequency falls below a specified limit and initiates load shedding

Words or expressions used herein and not defined shall have the meanings assigned to them under the Act and other Regulations issued by the Commission/Central Commission.

1.4 Application of other codes etc.

1. This code shall be read along with the, Chhattisgarh State Electricity Supply Code, Chhattisgarh State Electricity Regulatory Commission (Connectivity and Intra State Open Access) Regulation, 2011, other relevant provisions of the Act, and relevant Standards / following Regulations issued by Central Electricity Authority along with amendments thereon, rule and regulations made there under.
 - (i) Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006
 - (ii) Central Electricity Authority (Installation and Operation of Meters) Amendment Regulations, 2010
 - (iii) Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007
 - (iv) Central Electricity Authority (Safety Requirements for Construction, Operation and Maintenance of Electric Plants and Electric Lines), Regulation, 2008,
 - (v) Central Electricity Authority (Measures relating to Safety and Electric Supply), Regulation, 2010.
 - (vi) Central Electricity Authority (Grid Standards) Regulation, 2010
 - (vii) Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010.
 - (viii) Central Electricity Authority (Safety Requirements for Construction, Operation and Maintenance of Electric Plants and Electric Lines), Regulation, 2011,
2. Where any of the provision of this Code is found to be inconsistent with those of the Act,

rules or regulations made there under, notwithstanding such inconsistency, the remaining provisions of this Code shall remain operative.

3. Where any dispute arises as to the application or interpretation of any provisions of this Code, it shall be referred to the Commission whose decision shall be final and binding on the parties concerned.

4. Wherever extracts of the Electricity Act, 2003, are reproduced, any changes /amendments to the original Act shall automatically be deemed to be effective under this Code also

5. All Users who are connected to and/ or use the InSTS, shall comply with the relevant regulations and Chhattisgarh State Electricity Regulatory Commission (Intra-State ABT, Unscheduled Interchange charges and related matters) Regulations, to be notified and amendments thereon.

1.5 Structure of Chhattisgarh State Electricity Grid Code, 2011.

This State Grid Code contains the following chapters, namely:

Chapter - 1 :Introduction - This Chapter contains introductory parts of the Grid code and definitions of related terminology used in the Code.

Chapter - 2 : General - This part largely deals with the scope and application of these regulations and with Grid review Committee;

Chapter - 3 : Planning Code - This Code specifies the principles, procedures and criteria that shall be used in planning and development of intra-State transmission system;

Chapter - 4 : Connectivity Conditions and criteria - Connection Conditions specify the minimum technical and design criteria that shall be complied with by a Transmission Licensee and User connected to or seeking connection to the intra-State transmission system;

Chapter – 5 : Operating Code - This Code describes the conditions under which the State Load Despatch Centre shall operate the intra-State transmission system and under which Intra-State Users shall operate their facilities, in so far as necessary to maintain the security and quality of supply and safe operation of the intra-State transmission system.

Chapter - 6 : Scheduling and Despatch Code - This Code deals with the provisions related to development of Scheduling and Despatch Code for the State of Chhattisgarh.

Chapter -7 : Protection Code - This chapter deals with standard protection practices to be adopted for transmission lines sub-stations connected to State Transmission System.

Chapter - 8 :Metering Code - This chapter covers the standard technical specifications of metering practices to be employed in Transmission system connected to State Grid.

Chapter - 9 : Contingency Planning - This chapter outlines the contingency plan to be adopted by the entities connected to State Grid in case of total or partial outage of Transmission system.

Chapter - 10 : Safety Standards - This chapter describes safety standards to be adopted in operation of State Grid.

Chapter - 11 : Operation Event and Incident Reporting - This chapter describes the manner of operation and incident reporting by the entities connected to State Grids. **Chapter - 12 :Data Registration** - All the users of State Grid have been made responsible for proper data logging and data communication to STU. This chapter describes these issues.

Chapter - 13 : Miscellaneous - This part deals with a number of miscellaneous aspects including compliance with the State Grid Code, Power to amend, power to remove difficulties and dispute resolution etc.

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CHAPTER - 2 GENERAL

2.1 Scope of regulation and extent of application

2.1.1 These regulations shall be applicable to-

- i. every Transmission Licensee in the State including State Transmission Utility (STU);
- ii. the State Load Despatch Centre (SLDC);

- iii. Every User who is connected to and/or uses the intra-State transmission system:
- iv. All Users connected with and/or utilizing the Intra-State Transmission System (InSTS) are required to abide by the principles and procedures defined in this code/IEGC in so far as they apply to that User.

2.1.2 Transmission Licensee, forming part of the InSTS, and User, having connection(s) with the InSTS, should comply following requirements under these regulations.

- i. Enter into a connection agreement in accordance with chapter - 4;
- ii. Provide protection systems in accordance with Chapter - 7;
- iii. Provide communication facilities and compliance of telemetry requirement in accordance with Chapter - 4;
- iv. Provide for system recording instruments in accordance with Chapter - 12;
- v. Develop Single Line Diagrams in accordance with clause 4.8.2 of Chapter - 4;
- vi. Develop Site Common Drawings and site responsibility schedule in accordance with Clause 4.8.3 of Chapter -4 ;
- vii. Installation and Operation of meters in accordance with Metering Code developed as per Chapter - 8.

2.2. Availability of Chhattishgarh State Electricity Grid Code- 2011

The Commission, SLDC and STU shall display a copy of the State Grid Code - 2011 on their website. Printed copy of the State Grid Code - 2011 shall be made available by State Transmission Utility to any person at a price not exceeding the reasonable cost of printing it.

2.3. Role of STU and SLDC

The STU shall be responsible for managing and implementing this Code. The STU and the SLDC shall discharge such functions and responsibility as entrusted to them under the provisions of the Act and any other regulations issued by the concerned authority in an independent and unbiased manner.

In addition to above the SLDC shall also be responsible for “Operation of State UI pool Account, “State reactive energy Account” and “Congestion Charge Account” etc as may be provided in the relevant regulations. Provided that in event of a SLDC being operated by the STU, as per first provision of sub-section (2) of Section 31 of the Act, adequate autonomy shall be provided to the SLDC for it to be able to discharge its functions in the above mentioned manner.

2.4 State Grid Coordination Committee:

2.4.1 The State Grid Coordination Committee shall consist of the following members: i.

- Managing Director of Chhattisgarh State Power Transmission Company Limited (CSPTCL) - Chairman
- ii. Executive Director / Chief Engineer or In-charge of SLDC - Member Secretary
- iii. Executive Director / Chief Engineer nominated by Chhattisgarh State Power Generating Company Limited (CSPGCL) - Member
- iv. One representative nominated by SLDC- Member
- v. One representative nominated by each of distribution licensees - Member
- vi. One representative from each of Transmission licensees other than STU - Member
- vii. One representative from generating plants other than the CSPGCL with installed capacity of 500 MW and above connected with state grid - Member
- viii. One representative of the association, if any, of other generating plants other than at (vii) above - Member.

Note: Members mentioned at (vii) and (viii) above will have tenure of two years.

2.5 Functions of the committee.

2.5.1 The functions of the State Grid Coordination Committee shall be as follows: -

- i. Facilitating the implementation of these regulations and the rules and procedures developed under the provision(s) of these regulations.
- ii. assessing and recommending remedial measures for issues that might arise during the course of implementation of provisions of these Regulations and the rules and procedures developed under the provisions of these Regulations; iii. review of the State Grid Code, in accordance with the provisions of the Act and these Regulations; and suggest to the Commission, the necessary amendments/changes required to be brought, in these regulations for smooth operation of the power sector and in the interest of overall compliance to the provisions of the Act
- iv. to study such other matters as may be directed by the Commission from time to time.

2.5.2 The Committee will meet at least once in six months.

2.5.3 The Member Secretary shall present all proposals to the Committee for its consideration. The outcome of the meeting should be informed to Commission within 15 days.

2.5.4 The Committee may set up sub-committees for detailed study of related problems. The sub-committees may discuss with an Intra-state User its individual requirements and with groups of users to prepare proposals for the Grid Coordination Committee.

2.5.5 The recommendations of the Committee may be submitted to the Commission for consideration and approval. The Commission may amend the Grid Code on suo-motu or on the recommendations of the Committee as may be deemed fit. However, before any amendment is made in this code, comments on the proposed changes shall be obtained from the Intra-state users and the public.

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CHAPTER - 3 PLANNING CODE

3.1 Transmission system planning

3.1.1 In accordance with section 39 (2) (b) of the Act, the STU shall discharge all functions of planning and coordination relating to the state transmission system (STS) with CTU, State Govt., Generating Companies, Regional Power Committees, Central Electricity Authority, Licensee and any other person notified by State Government in this behalf which may utilize the state transmission system for evacuation or drawal of power from state transmission system.

3.1.2 The system planning specifies the technical and design criteria and procedure to be adopted by STU for the planning and development of the transmission system. The users of the transmission system shall take such system planning into account for planning and development of their own system. The STU in consultation with the Intra-State users shall evolve an efficient, secured and economical intra-state transmission system in order to satisfy the requirements of demand and generation.

- i. The STU shall upload on its Internet website the approved transmission system plan for the InSTS (intra-State Transmission System).
- ii. The transmission system plan shall cover a plan period of ten (10) years commencing from control period of five years. Business plan be got approved for five years of control period. Subsequent five year plan will be tentative and will be subjected to approval of the Commission. Approved business plan be reviewed every year and proposal for change, modification, addition or alteration in business plan be submitted by 30th September of every year for examination and approval. STU may also carryout change, modification in their tentative plan based on changed needs and may upload it in its website.
- iii. The transmission system plan shall include the proposed intra-State

transmission schemes for system strengthening for the benefit of Intra-state Users, as per business plan approved by the Commission. The transmission system plan may include information related not only to intra- State transmission lines but also additional equipment including transformers, capacitors, reactors, Static VAR Compensators and Flexible Alternating Current Transmission Systems: Provided further that the transmission system plan shall also include information on progress achieved on the identified intra-State transmission schemes and system strengthening schemes.

3.1.3 The formats of the transmission system plans shall be provided to distribution / transmission licensee by the State transmission utility and the same shall be available in the website of STU.

3.1.4 The need for reinforcement and extension of the system arises due to many reasons of which a few are mentioned below:-

- i. The development on a user's system already connected to the state transmission system.
- ii. Introduction of a new connection point between Intra-state user's system and the transmission system.
- iii. The need to increase system capacity, removal of operational constraints, maintenance of security standards and meeting general increase in demand.
- iv. Steady state and transient stability considerations.
- v. Cumulative effect of any combination of the above four.

3.1.5 The development of the transmission system must be planned in advance duly allowing sufficient lead time, considering the following:

- i. The time required for detailed engineering, design and construction work to be carried out. The system planning therefore enforces the time scales for exchange of information between the STU and the user(s). All the concerned parties, wherever appropriate, shall have due regard to the confidentiality of such information;
- ii. The time required for obtaining the necessary statutory approvals such as notification in government gazette Power and Telecommunication Co-ordination Committee (PTCC) clearance, Forest clearance, Railway clearance, clearance from civil aviation authorities, National highways, State highways etc., and the right of way permissions wherever required, shall also be taken into account.

3.2 Perspective Plan:

3.2.1 Load forecasting shall be the primary responsibility of distribution licensees within their area of supply. The distribution licensees shall determine the base load, peak load and energy forecast of their areas for ten years starting from commencement of five year control period for which business plan will get approved by STU from the Commission subsequently annual change in the data if any be submitted to STU every year. These shall include the details of demand forecasts, data methodology and assumptions on which the forecasts are based. The peak load and energy forecast shall be made for the overall area of supply. The STU shall also review the methodology and 14 assumptions used by the distribution licensees in making the load forecast, in consultation with them. The resulting overall forecast will form the basis of planning for expansion of transmission system, which will be carried out by the STU.

3.2.2 The STU shall forecast annual peak load for each connection point / interface point with the transmission system by considering the developing load of distribution licensee and long term open access requisitions by different generating stations. The peak load requirement at each connection point / interface point will be ensured by the STU. It may determine the corrective measures to be taken to maintain the capacity adequacy in the transmission system up to the connection point / interface point. This will facilitate the transmission licensee to develop a compatible transmission system. However, if the distribution licensee receives power at a

number of connection points/interface points in a compact area, which are interconnected in a ring then the load forecast should take care of that of transmission system the maximum load at any point of time is to be taken. These forecasts shall be updated annually and also whenever major changes are made in the existing system.

3.2.3 The STU shall be responsible to prepare a long-term (10 years) plan for the compatible expansion of the intra-state transmission system to meet the future demands.

Such planning shall be in conformity with followings: i.

Perspective plan formulated by CEA.

ii. Electric Power Survey of India published by the CEA.

iii. Transmission Planning Criteria and guidelines issued by the CEA.

iv. Operational Feedback from RPC, RLDC and SLDC.

v. Chhattisgarh State Electricity Regulatory Commission (Connectivity and Intra-State open access) Regulation, 2011 as amended from time to time.

vi. Any capacity addition in State.

This compatible intra-state transmission plan shall also include provision for reactive compensation needed for the transmission system.

3.3 Planning Standards and Procedures:

The State Transmission System shall be planned in accordance with the “Transmission Planning criteria” issued by CEA. The Transmission System Planning and Security Standard are the guidelines for planning and expansion of Transmission System in the State. The long term perspective planning involves an integrated approach for evacuating power from different generating stations under long term open access irrespective of their ownership, and delivering it to the beneficiaries over an

optimally designed transmission system with reliability, security and economy. The power system in the State grid has to be planned in such a manner, that the power received from all generating plants, share of power from Western grid and central sector generating stations, can be transmitted without constraints to different beneficiaries, as per their allocated shares, maintaining a reasonably good voltage profile, stability conditions and redundancy criteria.

The transmission planning should be developed to achieve a strong coordinated power system for the State, Western region and ultimately a national grid, where substantial inter-regional transfers can be achieved with optimized utilization of available generation. The transmission planning shall also provide a high standard of supply to beneficiaries with acceptable degree of reliability and at reasonable cost. The criterion should be that even under the conditions of the specified outages considered in the security standards, the power flow should not be affected. The transmission lines and sub-stations shall be so planned that the same can be upgraded when necessary in future, with minimum interruptions and modifications.

For the purpose of reducing inventory, procurement time and installation time, the transmission licensee shall adopt standardized designs as far as possible for transmission line towers, structures for sub-stations, sub-station lighting, control room lighting and ventilation, sub-station earthing, standardized specification for line materials, transformers, substation equipment, cables, bus bar accessories, insulators, hardwares, lightening arrestors etc.

The possibility of providing adequate connections within the State grid with inter state grid has to be considered wherever economically feasible considering all economic energy / capacity interchanges. The modern Flexible AC transmission system (FACTS) based on thyristor based controls, HVDC, fast controllable phase shifters etc., have also to be considered wherever economically feasible and / or constraints of corridor for construction of new transmission lines.

The scope of planning standard should cover:

i. system studies;

ii. assessment of the system data;

- iii. assessment of generation availability;
- iv. planning criteria;
- v. security conditions required for maintaining specified degree of reliability;
- vi. criteria for sub-station planning; and
- vii. estimation of reactive power compensation required.

3.3.1 System studies:

- i. The loads to be supplied from various sub-stations at steady state condition within the limits of declared voltage and acceptable frequency of 50 Hz and the future load development has to be assessed after making a detailed study of the present conditions and a load survey. A reasonable estimation of transmission losses shall also be included for arriving at peak availability, The system is to be further evolved based on the following power system studies:
 - (a) Load flow
 - (b) Optimal power flow for various conditions
 - (c) Short circuit
 - (d) System stability – steady state
 - (e) System stability – transient
 - (f) Studies to determine switching / temporary over voltages
 - (g) Other studies as required.
- ii. These studies require suitable computer programs. The models incorporating generation, transmission and load shall be prepared separately for each year of a plan period assessing probable year of commissioning of particular lines, substations, additional transformers in existing sub-stations etc., based on the system network for the year in question with all the generation and load buses properly located. Inter connections with the neighboring states at 400kV and 220kV levels shall also have to be incorporated. Appropriate equivalent circuit models shall be used to take into account the fault level at the connection points / interface points. The interconnection buses shall be modeled by representing significant and necessary portions of the neighboring networks to represent realistically the MW and MVA imports/exports. Studies shall be carried out both for peak load and zero load conditions.

3.3.2 Assessment of System data

To arrive at a reasonably accurate load forecast and for conducting studies, compilation and updating of system data is absolutely necessary. The planning study should begin with the proper representation of the existing system to establish the base case and to validate the model. The results obtained from the existing system should be verified with the meter readings, logged data at the sub-stations and the State Load Despatch Centre to closely match the same. The system parameters have to be updated incorporating the correct data whenever addition or modifications have been carried out on the system either by the survey of the correct line lengths and conductor configurations or preferably by direct measurement of the line impedance values whenever and wherever possible. All the system data shall be the same for both the planning standards and operation standards. The loads shall be modeled at 220KV and 132KV buses. The annual minimum load shall be taken as a percentage of annual peak demand as prevailing in the base year.

3.3.3 Assessment of Generation availability:

For peak load conditions, different generation mixes of various generating stations, resulting in an optimal average cost shall be determined by conducting the required number of load flow studies, or using well developed computer software packages to determine the same. For the minimum load conditions, the generator which “must run”, shall be used in conjunction with the most economical generation. The generation dispatch for the purpose of sensitivity analysis corresponding to a complete shutdown of a major generating station shall be worked out by increasing the generation at other stations to the extent possible keeping in view the maximum likely availability at those stations, cost of power, etc. transmission constraints will

have to be addressed properly. The transmission system being planned shall consider the adequacy of the network required to transmit power even under various outage conditions specified in the security standards. Studies shall be repeated for normal and contingency conditions as required in the security standards.

3.3.4 Planning criteria:

The Central Electricity Authority (CEA's) "Manual on Transmission Planning Criteria" shall be adopted with modification particularly with reference to steady state voltage limits and security standards in such a way so as to maintain steady state voltage within limits as per clause 5.2.17 of this code.

(a) Line loading limits:

The permissible line loading limits shall conform to CEA's "Manual on Transmission Planning Criteria". The over loading and under loading of lines shall be decided accordingly. Maximum line loading capacity as considered in the CERC (Rates and Charges and Terms and Conditions for use of intervening Transmission Facilities) Regulations, 2010 is as under:

Sr. No.	Voltage	Line loading capacity Considered (MW)
1.	400	450
2.	220	250
3.	132	90
4.	66	27

However, in view of CEA's "Manual on Transmission Planning Criteria" and looking to thermal limit and conductor size used, voltage wise maximum quantum of power permissible for injection into state grid is shown as in clause 4.2.1 of this code.

(b) Options for strengthening of transmission network:

- i. Addition of new transmission lines to avoid over loading of existing system (wherever three or more circuits of the same voltage class are envisaged between two sub-stations, the next higher transmission voltage may be considered).
- ii. Up-gradation of the existing transmission lines such as raising height of conductor supports and / or switch over to insulated cross-arms to facilitate change over to higher voltage, if the tower design so permits.
- iii. Replacement of conductor of the existing transmission line with higher size of conductors or with AAAC (All Aluminium Alloy Conductor).
- iv. The choice shall be based on cost, reliability, right of way requirements, energy losses, down time, etc.
- v. All single circuit lines shall be planned generally with double circuit towers, wherever technically feasible, to enable future expansion without right of way problems. Construction of multi circuit tower can also be planned to resolve right of way problem.

3.3.5 Security standards:

(a) Steady State Stability:

Security is the ability of the electric system to withstand sudden disturbance such as electric short circuit or unanticipated loss of system element, detailed in Clause 6 of "Manual on Transmission Planning Criteria" issued by CEA. The State Transmission System shall be designed for a security level of "n-1" i.e. to withstand a single contingency with little negative effect. This means the most severe fault or tripping of a critical generator, transformer or line should not result in instability of the system, overloading of lines and/or transformers for more than 15 minutes, voltage drop of more than 10% when the system import is increased by 20%. State Transmission Utility

/Transmission Licensee shall maintain the system security level of "n-1" (single contingency) plus spinning reserve margin for Steady State Operation.

The system shall be planned to withstand satisfactorily without any load shedding or altering the generation at generating stations for at least, any one of the following outage conditions:

- (a) Outage of any tower in a Double Circuit (D/C) transmission line.
- (b) Two circuits of 132kV or 220kV lines.
- (c) One circuit of 400KV line
- (d) One interconnecting transformer
- (e) One largest capacity generator
- (f) One inter-connecting line with neighboring grid.

The above contingencies shall be considered assuming a pre-contingency system depletion (planned outage) of another 220kV double circuit line or 400kV single circuit line in another corridor and not emanating from the same sub-station. All the generating stations shall operate within the limits as per their reactive capability curves and the network voltage profile shall also be maintained within the specified voltage limits.

(b) Transient stability:

The system shall be designed to maintain synchronism and system integrity under the following disturbances:

- (a) Outage of the largest size generator in the State grid or connection with neighboring grids.
- (b) A single line to ground fault on a 400 kv line, single pole opening of the faulty phase (5 cycles) with unsuccessful reclosure (dead time 1 sec) followed by 3 pole opening (5 cycles) of the faulty line.
- (c) 400 kV D/C line.
 - (i) When both the circuits are in operation, the system shall be capable of withstanding a permanent fault on one of the circuits followed by a three-pole opening (100-m.sec.) of the faulty circuit.
 - (ii) When one of the circuits is under maintenance / outage the system shall be capable of withstanding a transient fault on the circuit in service.
- (d) A permanent 3-phase fault with duration of 8-cycles on 220 kV or 132kV line assuming three-pole opening.
- (e) No stability studies for faults are required for radial lines.

3.3.6 Substation planning criteria:

For meeting a particular quantum of load, the number of required Sub-stations depends upon the choice of voltage levels, the MVA capacity and the number of feeders permissible etc. The number of EHT transformers, Interconnecting Transformers shall also be considered in planning to take care of contingencies of planned/forced outages. In all EHV sub-station (132 KV and above) should have at least Two transformers. The following criteria can be adopted:

- (a) The capacity of any single substation at different voltage levels shall normally not exceed the following as per CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010.

765 kV	4500MVA
400kV	1500 MVA
220 kV	500 MVA
132 kV	150 MVA

- (b) Size and number of Interconnecting Transformers (ICTs) shall be planned in such a way that outage of any single unit would not overload the remaining ICTs or the

underlying system. Normally there should not be more than three power transformer / ICT in EHV sub-station.

- (c) Size and number of Transformers in EHV sub-station shall be planned in such a manner that in the event of outage of any single unit, the remaining transformers may supply adequate load. This has to be achieved in such a manner that, with the connection of the adjacent Sub-stations, the load exceeding the capacity of the available transformers may be transferred on to neighboring sub-station.
- (d) The rated rupturing capacity of the circuit breakers in any Sub-station shall not be less than 120% of the maximum fault levels at the sub-stations. (The 20% margin is intended to take care of increase in short circuit levels as the system grows). The minimum rated rupturing capacity and duration of switchgear at different voltage levels are as follows as per CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010:

11 kV	16 kA for 1 sec in urban area. 12.5 kA for 1 sec in rural area
33 kV	25 kA for 1 sec.
132 kV	31.5 kA for 1 or 3 sec*
220 kV	40 kA for 1 sec
400kV	40 kA or 50 kA for 1 sec
765 kV	40 kA or 50 kA for 1 sec

* 1 or 3 sec. Duration may be decided as per fault level.

- (e) While sub-station planning, Insulation level of transformers and reactor windings and bushing should be taken as per following table as specified in CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulation, 2010.

Rated Voltage	Windings			Bushings		
	Rated power frequency withstand voltage (kVrms)	Rated switching impulse withstand voltage (kV peak)	Rated lightning impulse withstand voltage (kVpeak)	Rated power frequency withstand voltage (kVrms)	Rated switching impulse withstand voltage (kV peak)	Rated lightning impulse withstand voltage (kVpeak)
800kV	-	1550	1950	880	1550	2100
420kV	-	1050	1300	630	1050	1425
245kV	395	-	950	460	-	1050
145kV	275	-	650	275	-	650
72.5kV	140	-	325	140	-	325
52kV	95	-	250	95	-	250
36kV	70	-	170	70	-	170
24kV	50	-	125	50	-	125
17.5kV	38	-	95	38	-	95
12kV	28	-	75	28	-	75

3.3.7 Transmission line planning criteria:-

(a) Transmission System:-

- (1) The transmission System shall be planned in an integrated manner and optimized considering the total network under Central Transmission Utility

(CTU) and State Transmission Utility (STU), and any other transmission licensee in area.

- (2) The adequacy of the transmission system shall be tested for one or more load generation scenarios comprising of peak and off peak conditions in summer, winter and monsoon seasons.
- (3) Right of way for transmission lines shall be optimized keeping in view the corridor requirement for the future by adopting suitable alternative of multi-circuit or multi-voltage lines as found suitable.

(b) Routing of Transmission Line – The transmission line route shall be selected keeping in view the following:

- (1) Routing of a transmission line through protected or reserved forest shall be avoided. In case it is not possible to completely avoid the forests or areas having large trees, keeping in view the overall economy, the route shall be aligned in such a way that cutting of trees is minimum. Routing of a transmission line through National Parks or Wild Life sanctuaries should also be avoided.
- (2) Restricted areas such as civil and military airfields shall be avoided care shall also be taken to avoid aircraft landing approaches.
- (3) The line routing should avoid large habitations, and densely populated areas. (4) It shall be ensured that all statutory requirements stipulated under Forest Conservation Act, Wild Life Protection Act, Archeological Survey Act and other Acts/Rules/Laws, as may be applicable, are complied with.
- (5) The Owner shall arrange all required consents and approvals including those from Power and Telecommunication Co-ordination Committee (PTCC), and for civil aviation, road, river, rail, canal or power line crossings, way leaves and environmental & forest clearances etc. from the concerned authorities/agencies.
- (6) Right of way and way leave clearance shall be arranged by the Owner in accordance with the requirements of construction. Compensation for right of way & way leaves shall be given as per applicable law, rules & regulations, guidelines and directives of local administrative and revenue authorities.

(c) Salient technical particulars and requirement of transmission lines:- Electrical Design Parameters of transmission lines -

Parameter	132 kV AC	220 kV AC	400 kV AC	765 kV AC	500 kV DC
Nominal voltage (kV)	132	220	400	765	500
Highest system voltage (kV)	145	245	420	800	525
Full wave impulse withstand voltage (1.2/50 micro sec.) (kV peak)	650	1050	1550	2400	1800
Power frequency withstand voltage under dry condition (kV rms)	275	460	680	830	-
Switching surge withstand voltage under wet condition (kV rms)	-	-	1050	1550	1000
Minimum corona extinction voltage under dry condition (kV rms) phase to earth	-	156	320	510	550

Maximum radio interference voltage (micro volts) at 1 MHz for phase to earth voltage of ____ kV under dry condition	-	1000 at 156kV	1000 at 267kV	1000 at 510kV	1000 22 kV/cm conductor surface gradient
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(d) Normal design span for various voltage level transmission lines shall generally be as shown below :

Voltage (kV)	Normal span (meters)
765	400, 450
400	400
220	335, 350, 375
132	315, 325, 335

3.3.8 Reactive compensation:

(a) **Shunt capacitors:** Shunt capacitor shall be installed at 33 kV and 11 kV system preferably at load centres. In case it is not possible at load centre, then reactive compensation shall be provided in 132 kV systems with a view to meet the reactive power requirement of load close to the load points. The capacitors shall be of automatic switched type for sub-station of 5 MVA and higher capacity. In case of sub station loaded with highly fluctuating loads like arc furnaces etc., flickers and voltage regulation problems shall be overcome by installation of static var compensators (SVCs)

(b) **Shunt reactors:** Switch-able shunt reactors shall be provided at 400 kV sub-stations for controlling voltages within the limits specified. The step changes shall not cause a voltage variation exceeding 5%. Suitable Line Reactors (Switch-able/Fixed) shall be provided to enable charging of 400kV lines without exceeding voltage limits specified.

The Standard sizes (MVAR) of reactors are -

- (i) 400 kV (3-ph units) 50, 63 & 80 at 420 kV
- (ii) 765 kV (1-ph units) 50, 63 & 110 at 800 kV

The line reactors shall be installed for long line at high voltage level for curtailing switching over voltage and limiting the fault currents.

3.4 To enable the STU to discharge its responsibilities under the transmission license by conducting system studies and preparation of the perspective plans, all the Intra-state 24 users shall furnish the necessary data to STU from time to time as given under Data Registration Chapter 12 and categorized as planning data (PD), vide **Annexure-A** The data pertaining to InSGS running parallel with grid, shall be updated on any addition of generating unit / modification of the distribution / transmission system.

3.5 To enable the Intra-state users to co-ordinate planning, design and operation of their plants and systems with the transmission system they may seek certain salient data of the transmission system as applicable to them. STU/transmission licensee shall supply these data as per **Annexure-B** categorized as Detailed Transmission System Data.

3.6 In addition to the above provisions, the planning code of the Indian Electricity Grid Code (IEGC) which calls for data exchange shall also apply to the generating companies, transmission licensees, utilities and distribution licensees regarding generation / transmission of energy from inter-state transmission systems.

3.7 One time data as per Annexure "A" shall be submitted within 3 months from the date the Grid Code comes into effect, by all the concerned, to the STU. Also, all concerned have to intimate the changes, if any, in the data provided as one time data. In reporting of such data CSERC (Connectivity and Intra-State Open Access) Regulation, 2011 as amended from time to time should be followed.

CHAPTER - 4

CONNECTIVITY CONDITIONS AND CRITERIA

4.1 Introduction & Objective

- (i) Users connected to/ or seeking connections to intra-state transmissions system shall comply with CEA (Technical Standards for Connectivity of Grids) Regulations, 2007 and Chhattisgarh State Electricity Regulatory Commission (Connectivity and Intra State Open access) Regulations, 2011 wherever applicable.
- (ii) Wherever the State grid is connected to the Inter-State transmission system, the provisions relating to connection conditions of IEGC will prevail.
- (iii) The objective of connectivity condition specified in this chapter is as given below.
 - a. To ensure safe operation, integration and reliability of the state grid.
 - b. The basic rules for connectivity conditions are complied with, in order to treat all Intra-state users in a non-discriminatory manner.
 - c. Any new or modified connection when established should not impose unacceptable effect on the system and/or on Intra-state user of system.
 - d. Any person seeking connectivity to the grid is required to be aware of in advance, the procedure for connectivity to intra-state transmission system and also standard and condition, its system has to meet for being integrated with state grid

4.2 Connection points/interface points:

4.2.1 Generating Stations: The voltages at which a generating station may be connected with the grid of transmission or distribution licensee (as applicable) can be 400, 220, 132 or 33 KV. The connection point/interface point shall be the point at the sub-station of the licensee system where power is injected. The metering point shall be at the connection point / interface point.

Following are the prescribed quantum for injection of power to the state grid with reference to voltage of injection: -

Sl. No.	Voltage of injection	Maximum Quantum of power that can be injected into grid
1.	33 KV	Up to 15 MVA
2.	132 KV	Up to 75 MVA for single circuit and 150 MVA for double circuit
3.	220 KV	Up to 200 MVA for single circuit and 400 MVA for double circuit

- Note: 1.** For arriving at the quantum of power to be injected in MVA, power factor as indicated in the nameplate or the design details of the generator will be taken into account.
- 2.** Under special circumstances, any deviations from the above limits may be considered by the licensee subject to technical feasibility and specific approval by the Commission. Subject to fulfillment of minimum technical requirement of meter as specified at clause no. 8.6 of this code.
- 3.** Provision for redundancy in dedicated transmission line shall be the responsibility of generator concerned.

4.2.2 All the generating stations including captive generating plants (CGP) having injection and / or drawal requirements of more than 15 MVA shall have connectivity with the grid under either of the following modes, at their own cost, subject to technical feasibility :-

1. At nearest EHV sub-station through dedicated EHV transmission line.
2. At pooled / switching / load catering / step up EHV sub-station with dedicated EHV transmission line.
3. No tap connectivity at EHV line shall be allowed.

4.2.3 All the generating plants including captive generating plants having injection and / or drawal requirements from the grid up to and including 15 MVA shall have connectivity with the grid under either of following modes, at their own cost, unless otherwise specified by the Commission subject to technical feasibility:-

1. At nearest EHV sub-station through dedicated 33 KV line.
2. At nearest 33/11 KV sub-station through dedicated 33 KV line.
3. At 33 KV switching or pooling sub-station through dedicated 33 KV line.
4. No tap connectivity on 33 kv line shall be allowed.

4.2.4 All the existing generators including CGPs connected with the grid under any modes other than prescribed at Clause 4.2.2 and 4.2.3 shall have to ensure connectivity with the grid as per prescribed options given in Clause 4.2.2 / 4.2.3 failing which their connectivity shall be liable for disconnection from the grid. However, Commission may allow such connection for certain period on request of the Intra-state user as a special case on compelling reasons.

Connectivity through pooling substation will be allowed only if found technically feasible. The cost of common infrastructure like, transmission line, switchgear / step up transformer or any other equipment / infrastructure including the facility for real time data transfer/communication etc. as the case may be, shall be borne by the constituent generators/CGP(s) in proportion to their respective power injection to the grid.

An existing generating plant, presently not covered under clause 4.2.2 and 4.2.3, shall be subject to load-shedding plan of CSPDCL as and when enforced, till their connectivity is as per clause 4.2.2 or 4.2.3 as the case may be.

4.2.5 **Distribution Licensee:** The connection point / interface point shall be the outgoing feeder gantry of transmission licensee's sub-station. The metering point can be at 33 or 11 kV side of EHV power transformer at transmission licensee's sub-station. In case of EHT consumer, the connection point / interface point shall be metering point on incoming feeder gantry of EHT consumer substation. The distribution licensees shall maintain the metering equipments at the connection point / interface point in case of EHT consumers. In case of multiple distribution licensees metering shall be at their respective interface point. All the terminal equipments for communication, protection and metering within the premises of the transmission licensee shall be owned and maintained by the transmission licensee.

4.2.6 **Connections with other transmission systems:** The connection, metering and protection scheme, metering point and the voltage of Transmission System of other state shall be in line with the agreement between the CTU and STU / transmission licensee. The connection with transmission systems of any other transmission licensee within the state shall be in accordance with the agreement between the concerned licensees.

4.3 Procedure for applications for connection to the transmission system:

Any generator/Captive Generating Plant/licensee/Open access customer seeking to establish new or modified arrangements for connection to and/or use of the transmission system shall submit an application along with prescribed fee as decided by CSERC as per procedure as defined in regulation 10 of Chhattisgarh State Electricity Regulatory Commission (Connectivity and Intra State Open-Access) Regulations, 2011 as modified from time to time.

4.4 General principles and conditions for grid connectivity: -

Grid connectivity shall be generally provided subject to the following conditions: -

1. All Intra-state users or prospective users are treated equitably.
2. A system of acceptable quality is ensured by specifying the required minimum standards for the design and operational criteria to assist the Intra-state users to comply with the license obligations.
3. The ownership and responsibility for all equipments is required to be clearly specified in the "site responsibility schedule" for every site where a connection is made.

4. Interconnection of a 132 KV to 400 KV AC sub-station (depending on the bus configuration) with the transmission and generator feeder / lines be terminated into bays containing one or more breakers.
5. The paralleling of generator / captive generator would be allowed only after ensuring proper protection schemes adopted by the generator/captive generator on inter-connecting feeders and proper operational measures (provision of sectionalizer, breaker etc. at generators end). The list of protecting devices and equipments to be installed at generator end on the interconnecting feeders would be informed to the STU/transmission licensee, by the generators. Similarly protective device / equipment provided on inter- connecting feeder by transmission licensee should be informed by transmission licensee to the generator.
6. Captive generators if having connectivity with STU system may have to pay parallel operation charges to the concerned licensee, as may be decided by the Commission from time to time.
7. The Intra-state user shall not force changes in maintenance schedules of utilities in the grid, due to constraints arising in his system during grid operation.
8. All generators (including CGP) will make adequate arrangement for isolation and islanding of their unit(s) in case of system distress conditions.
9. Depending on the requirement of the system, the generator/ captive generating plant will provide adequate reactive power to the system matching with the active power supply subject to the designed limitations of generator as specified by the manufacturer.
10. In case of low frequency, the total spinning reserve capacity available with the generators should be brought in to operation for maximizing their generation/ captive power generation.
11. Under extreme emergencies when captive generator is not injecting power, captive / non captive consumers may also liable to observe load shedding.
12. For scheduling and despatching of demand/drawal/bilateral exchanges etc, the CGPs will be treated at par with the other generators.
13. The Intra-state user shall take care of modification of equipment ratings, if any, of both his system and grid connection point equipments arising due to connectivity modification.
14. The Intra-state user shall satisfy protection standards and relay coordination aspects at the connection point as per overall grid norms..
15. The Intra-state user shall provide tele-metering, SCADA and transfer of other relevant data from the points of interconnection of concerned Intra-state user (s) to SLDC, to facilitate the grid operation.
16. The Intra-state user shall take care of his system in the event of grid initiated disturbances and not rely on grid defence mechanisms alone.
17. The Intra-state user shall ensure installation of sensitive and reliable protection system for fast opening of breaker and isolation of its installation from grid due to disturbances initiated from his system.
18. The Intra-state user shall take part in islanding and other grid schemes by contributing generation/load wherever available, as decided by the SLDC, The applicant shall follow load restoration guidelines during islanded operation as per instructions of the SLDC.
19. The Intra-state user shall help the grid by supplying start-up power if warranted by SLDC, in case it has generating sources in its area.
20. The Intra-state user shall provide relevant protection tripping data in the events of grid disturbances to SLDC for analysis and ensuring safe and reliable grid operation.

21. Grid shall help the Intra-state user in the event of his system failures, by way of assistance for start up power and restoration by SLDC.
22. The Intra-state user shall ensure safety standards and follow operating procedure during maintenance of common portion by other utility personnel, including line permits and allowing locking of isolator in open position to prevent accidental charging.
23. The intra state user shall ensure proper tele-metering, accessibility by express communication, so that grid inter-connectivity data is made available to all concerned.
24. The Intra-state user shall ensure that proper energy meters are installed as per provision in Chapter 8 of this code.
25. The licensee shall perform testing/calibration of equipments and energy meters at inter connection points in presence of interested parties and concerned utilities and make available test reports of such periodic testing to interested parties and concerned utilities/organizations including SLDC.
26. The Intra-state user shall plan maintenance schedule of their lines/inter connecting transformers (ICTs) or bay of inter connection line in consultation with the SLDC/STU.
27. In exceptional circumstances of system operation, SLDC will have the right of postponing a maintenance schedule in the Intra-state user's system if adverse conditions exist. This will however be an exception and not rule.
28. The Intra-state user shall satisfy such other prevalent norms of equipment and personnel safety, equipment protection and grid operation code, environment safety norms and such other national policies which are not listed here in this document.
29. The Intra-state user shall share information whenever his system adopts and follows higher than prescribed norms/standards in respect of equipment protection, grounding and other operation/protection standards and human safety as given by the STU and CEA so that grid and nation may benefit from the improved standards.
30. The Intra-state user shall not energize a dead utility connection unless permitted by SLDC.

4.5 Telemetry Requirements: -

- 4.5.1. All Intra-state users and Transmission Licensees including the State Transmission Utility shall provide the required facilities at their respective ends as specified in the Connection Agreement: Provided that the equipments/devices for communication and data exchange shall be provided considering the guidelines of STU & State Load Despatch Centre, the interface requirements and other such guidelines/specifications as applicable.
- 4.5.2. Reliable and efficient speech and data communication systems shall be provided to the SLDC to facilitate necessary communication and data exchange, and supervision/control of the State Grid by the State Load Despatch Centre, under normal and abnormal conditions.
- 4.5.3. It is the responsibility of the STU & Transmission Licensees, Intra-state users including the Distribution Licensees to provide the necessary system operation parameters as specified by the SLDC on real time / online basis making use of the state of the art technology (Data Acquisition & communication) for effective operation of the state grid in coordination with the regional grid.
- 4.5.4. SLDC shall ensure reliable communication channel with RLDC. SLDC shall install and maintain Voice logging systems for recording telephonic instructions and information.
- 4.5.5. Telemetry is required for 1 MW and above intra-State users seeking connection to intra-State transmission system or network of distribution licensee and also availing open access. These intra-State user shall provide necessary facilities for voice and data communication and transfer of online operational data such as voltage frequency, load flow etc. The state transmission utility

or transmission licensee as the case may be shall install such infrastructure facilities for and at the cost of the intra-State user.

4.5.6 Station service load may require separate telemetry if it comes from a different Load Control Area. Telemetry of active and reactive power, energy (KW, KWh, KVA_r, KVA_{rh}), Voltage(KV) and other parameters such as Breaker status & Control etc is normally required.

4.6 Safety

At the point of interconnection to the grid an isolating device, which is typically an isolator/disconnect switch, shall be provided that physically isolates the grid from the project. Safety and operating procedures for the isolating device shall be in compliance with the standards of safety as laid down by the Central Electricity Authority under Section 73(c) of the Act. The isolating device may be placed in a location other than the point of interconnection, by agreement of STU and affected parties. In any case the device:

1. must simultaneously open all phases (gang-operated) to the project/Intra-state user;
2. must be accessible to STU and under ultimate SLDC jurisdiction;
3. must be lockable in the open position by STU;
4. would not be operated without advance notice to either party, unless an emergency condition requires that the device be opened to isolate the project;
5. must be suitable for safe operation under the conditions of use; and
6. may be locked by STU personnel in the open position and install safety boards:
 - i. if it is necessary for the protection of maintenance personnel when working on de-energized circuits;
 - ii. if the project/Intra-state user or STU equipment presents a hazardous condition;
 - iii. if the project/Intra-state user or STU equipment interferes with the operation of the grid;
 - iv. if the grid interferes with the operation of the project/Intra-state user.

Since the device is primarily provided for safety and cannot normally interrupt load current, consideration shall be given as to the capacity, procedures to open, and the location of the device.

4.7 Other Considerations

4.7.1 **Equipment for Grid connectivity of generating unit** shall be in conformity with the following requirements:

The overall system shall be designed considering maximum voltage variation of +/- 5% and fault level of 40KA for 400KV system.

Frequency variation shall be +3 to -5% and Equipment shall be suitable for 50 °C ambient.

1. For Generator:

Voltage Variation	±7.5% continuously at rated power factor. Reduced MVA operation at 110% of the rated voltage.
Frequency Variation	47.5 HZ. To 51.5. Hz.
Combined voltage and frequency variation	± 5%
Power Factor variation	0.85 (lag) to 0.95 (lead)
Operation under unbalanced load	As specified in IEC 34-1
Short circuit ratio	As per IEC 34-1

Operation under unsymmetrical short circuit	Negative sequence current I_2 expressed in per unit of rated current for a duration of 't' second such that the value of $(I_2)t$ shall comply to IEC 34-1
Voltage Wave form	The total harmonic factor (T.H.F.) shall be within the limit specified in IEC 34-1
Short Circuit withstanding capacity	Capable of withstanding of 3 phase short circuit at the generator terminals when operating at rated MVA and power factor with 5% over voltage for a period of not less than 3 seconds.
Special operating conditions	Capable of withstanding the electrical mechanical and thermal stresses developed during fast reclosing of high voltage line, transmission line switching, faults, out of step operation and out of phase synchronization etc.
Line charging capability	Not less than 30% of its rated MVA at zero pf.

2. For Excitation System:

- i) Characteristics: The excitation system shall have matching characteristics suitable for satisfactory parallel operation with other generator in the plant.
- ii) Equipment design and sizing criteria:

General	When the generator is subjected to a sudden loss of rated output at rated power factor, the system shall be capable of restoring the voltage of within 2% of the nominal preset value within negligible time, so as not to initiate the protection equipment.
b) Excitation system response time as per IEEE 421 A	<0.5 sec.
c) Excitation response ratio	>2
d) Excitation system ceiling voltage	> 1.5 times rated load excitation voltage
e) Field forcing capability	Each excitation system channel shall be capable of supplying without damage to any of the components, the field forcing voltage and current of the system for a period of 10 seconds without exceeding the limits of temperature

f) Power System Stabilizer	Power System Stabilizers (PSS) shall be suitable for damping the various models of electro-mechanical oscillations at all frequencies in the range of 0 to 3 Hz. under varying generator loading and power system network considerations. PSS shall be adaptive to varying operating conditions with features to compute optimum stabilizing signal along with suitable scheme for identifying external reactance of the generator. Facility for remote manual switch off-on alongwith indication shall be incorporated. Automatic supervision and blocking/switch off facility alongwith indications etc. shall be provided.
g) Rotor angle limiter	A rotor angle limiter shall be incorporated in the system. This shall enable to keep the angle between the direct axis of the machine and network vector within the set reference value as determined by stability by adjusting the excitation.
h) Stator current limiter	The stator current limiter shall act immediately in under excited range. The time delay in over excited range shall enable a temporary overloading of the machine.
i) Rotor current limiter	The regulator shall act with time delay, so that the regulation dynamics are not impaired in case of a fault
j) Voltage/frequency(V/Hz) limiter	To limit the ratio of generator voltage and frequency at all operating conditions to such a value that the maximum generator transformer core flux density does not exceed the value specified
k) HV Switchyard should be suitable for the following parameters	
i) X/R Ratio of the system	14
ii) Design BIL (Basic Insulation Level)	$\frac{400kV}{1425kVp}$ $\frac{220kV}{1050 kVp}$ $\frac{132kV}{650kVp}$
iii) Lightning Arrester voltage rating in kVrms	336, 198, 120
iv) Requirement of protection	Main-I & Main-II distance protection on outgoing lines.
v) Requirement of metering	0.2S accuracy metering class

vi) Requirement of load shedding, islanding	Required
vii) Earth mat design criteria	40 kA 1 sec.

Existing electrical equipment in the STU system, such as transformers, power circuit breakers, disconnect switches, arresters and line conductors shall be installed based on the duties expected in response to system additions identified in long-term plans. However, with the interconnection of a new generating resource, some equipment may become under-rated and need to be replaced.

4.7.2 System Stability and Reliability

The STU system is developed with careful consideration for system stability and reliability during disturbances. The size of the project, breaker configurations, generator characteristics, and the ability to set protective relays will affect where and how the point of interconnection is made. The project may also be required to participate in special protection schemes (remedial action) such as load dropping.

4.7.3 Control and Protection

STU coordinates its protective relays and control schemes to provide for personnel safety and equipment protection and to minimize disruption of services during disturbances. Project interconnection usually requires the addition or modification of protective relays and/or control schemes. New projects must be compatible with existing protective relays schemes. Sometimes, the addition of voltage transformers (VTs), current transformers (CTs), or pilot scheme (transfer trip) also are necessary, based on the point of Interconnection.

4.7.4 Dispatching and Maintenance

SLDC operates the grid to provide reliable customer service while meeting the seasonal and daily peak loads even during equipment outages and disturbances. Project integration requires that the equipment at the point of interconnection not restrict timely outage coordination, automatic switching or equipment maintenance and

scheduling. Reliable service may require additional switchgear, equipment redundancy, or bypass capabilities at the point of interconnection for acceptable operation of the system.

The generator is expected to supply up to maximum available reactive capability and / or to adjust generation levels including reducing to zero if required by the SLDC. This will always be for reliability purposes only in exigencies.

4.7.5 Atmospheric and seismic conditions

The effects resulting from windstorms, floods, lightning, elevation, temperature extremes and earthquakes must be considered in the design and operation of the project. The Intra-state user(s) will be responsible for determining that the appropriate standards, codes, criteria, recommended practices, guides and prudent utility practices are met with.

4.8 Site responsibility schedule

4.8.1 For every connection to the licensees system a site responsibility schedule shall be prepared in accordance with CEA Regulations and CSERC OA Regulations/ detail procedure approved by the Commission.

4.8.2 Single Line Diagrams

1. Single Line Diagram shall be furnished for each Connection Point by the Intra-state users to STU and SLDC. These diagrams shall include all HV / EHV connected equipment and the connections to all external circuits and incorporate numbering, nomenclature and labeling, etc. The diagram is intended to provide an accurate record of the layout and circuit connections, rating, numbering and nomenclature of HV / EHV apparatus and related plant.

2. Whenever any equipment has been proposed to be changed, then concerned intra state user shall intimate the necessary changes to STU and to all concerned. When the changes are implemented, changed Single Line Diagram shall be furnished by the agency to SLDC/STU.

4.8.3 Site Common Drawings

- i) Site Common Drawing will be prepared for each Connection Point and will include site layout, electrical layout, details of protection and common services drawings. Necessary details shall be provided by the Intra-state users to STU.
- ii) The detailed drawings for the portion of the Intra-state user and STU/transmission licensee at each Connection Point shall be prepared individually and copies shall be exchanged between Intra-state user and STU.
- iii) If any change in the drawing is found necessary, the details will be exchanged between Intra-state users and STU as soon as possible.

4.9 System Performance:

- 4.9.1 The design and construction of all the equipment connected to the transmission system shall satisfy the relevant Indian standard specifications. In case of equipment for which the Indian Standard Specifications do not exist, the appropriate IEC, or IEEE or other International Standards shall apply.
- 4.9.2 Installation of all electrical equipment shall comply with Standards/Regulations of CEA which are in force for the time being and will be replaced by new Standards/Regulations accordingly.
- 4.9.3 For every new connection sought, the transmission licensee shall specify the connection point/interface point and the supply voltage, alongwith the metering requirements as specified in the Metering Code.
- 4.9.4 **Supervisory control and data acquisition (SCADA):** The transmission licensee shall install and make operative an operational metering data collection system under SCADA for storage, display and processing of operational metering data. All Intra-state users shall make available outputs of their respective operational meters to the SCADA interface equipment for display at the SLDC.

4.10 Protection requirement:

Intra-state users and transmission licensee shall follow protection system and coordination as specified in part-I of CEA (Technical Standards for Connectivity to the Grid) Regulations, 2007 for grid connectivity. They should also abide with protection functions mentioned in schedules of CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010. These are also specified in chapter of protection code in this code.

4.11 Metering Requirement: Transmission Metering code as depicted in Chapter 8 of this code shall be applicable to user of State transmission system. The metering requirements shall be strictly in accordance with the CEA (Installation and Operation of meters) Regulations, 2006 and its amended Regulation, 2010 under Section 55 of the Act with regard to installation & operation of meters. Location of metering point shall be as per provision in CSERC (Connectivity and Intra-State Open access) Regulations, 2011 as amended from time to time.

4.12 Reactive Power Compensation

- 4.12.1. "Reactive Power compensation and/or other facilities shall be provided by Intra-state users, as far as possible, in the areas prone to low or high voltages systems thereby avoiding the need for exchange of Reactive Power to/from the Intra-STU and to maintain the Intra-STU voltage within the specified range at all times. Their healthiness and operation as per real time requirement shall be ensured by the Intra-state user and STU."
- 4.12.2. Line Reactors may be provided to control temporary over voltage within the limits as set out in connection agreements.

4.12.3. The reactive compensation to be provided by the Intra-state user if any at the time of connectivity shall be indicated by State Transmission Utility in the Connection Agreement for implementation.

4.12.4. Switching in/out of all 400 kV bus and line Reactors throughout the grid shall be carried out as per instructions of State Load Despatch Centre. Tap changing on all 400/220 kV Interconnecting Transformers shall also be done as per the instructions of State Load Despatch Centre only.

4.13 Inadvertent Flow: When two systems are operating in parallel with floating tie-line, it may not be possible to have tie line absolutely floating because of dynamics of network parameters and there will be a flow of energy from one system to another system. Such inadvertent flow shall be accounted for the purpose of commercial billing.

4.14 Right to reject an application:

4.14.1 An incomplete application, and/or an application not found to be in conformity with the Regulations and Procedures approved by the Commission, shall be rejected.

The transmission licensee may reject any application for connection to and/or use of the transmission system under the following conditions:-

1. If the proposed connections violate any provisions under the transmission license.
2. If the proposed works stated in the application do not come within the purview of the licensee or do not conform to the provisions of this Grid Code and CEA Regulations issued u/s 177 of the Electricity Act, 2003.
3. If the system capacity does not permit.

4.14.2 In the event of an offer becoming invalid or rejected within the validity period, no further action shall be taken by the STU/transmission licensee on the connection 39 applications unless it is substantially different from the original application with regard to the system changes.

4.15 Connection Agreement

4.15.1 Connection Agreement shall include, as appropriate, within its terms and conditions, the following information relating to the connection of the User or Transmission Licensee to the STS:

- (i) a condition requiring both parties to comply with the State Grid Code, Indian Electricity Grid Code specified by CERC if applicable and all other regulations concerning Standards of Grid Connectivity, Safety and security notified by the Authority
- (ii) details of connection, technical requirements and commercial arrangements;
- (iii) details of any capital expenditure arising from necessary reinforcement or extension of the system, data communication etc and demarcation of the same between the concerned parties;
- (iv) Site Responsibility Schedule;
- (v) General philosophy and guidelines on protection;
- (vi) Protection systems;
- (vii) System recording instruments;
- (viii) Communication facilities; and
- (ix) Any other information considered appropriate by the State Transmission Utility or the Commission.

4.15.2 STU shall develop a model Connection Agreement as mentioned in CSERC (Connectivity and Intra-State Open access) Regulation, 2011. STU shall inform the progress of new projects inter-connecting with ISTS in advance to enable CTU to coordinate installation of meters, SCADA data integration, speech and protection etc.

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CHAPTER - 5 OPERATING CODE

5.1 Operation Policy:

1. The primary objective of integrated operation of the State grid is to enhance the overall operational economy and reliability of the entire electric power network spread over the geographical area of the State. The operation of the transmission system shall be consistent to IEGC, 2010 and its modification(s), if any. The Intra-state user shall however be subject to the grid discipline prescribed by the SLDC.
2. Overall real time operation of the State grid shall be supervised by the SLDC. The role of SLDC and STU shall be in accordance with the provisions of the Act and CSERC (Intrastate open access and connectivity) Regulations, 2011. All intra State entities shall comply with these operational guidelines and coordinate with each other, for deriving maximum benefits from the integrated operation and for equitable sharing of obligations. Every generating company and transmission licensee shall provide written operating instructions for each equipment and operating procedure for sequence of operations of power system equipment in their control room. The operating instructions followed shall not be inconsistent with the manufacturer's instructions. The operating instructions and procedures may be revised by the generating company or transmission licensee, as the case may be.
3. A set of detailed internal operating procedures for the State grid shall be developed and maintained by the SLDC in consultation with the intra State entities, RLDC which shall be consistent with State Grid Code and IEGC, 2010 and its amendments. These internal operating procedures shall include the following:
 - i. Black start procedures.
 - ii. Load shedding procedure as approved by the Commission.
 - iii. Islanding procedure.
 - iv. Any other procedure considered appropriate by the State Load Despatch Centre.

All operational instructions given by Regional Load Despatch Centres and State Load Despatch Centres through telephone, Fax, e-mail, etc shall be given a unique operating code number. State Load Despatch Centre shall maintain a voice recorder for recording and reproduction of conversation with time tag or stamp. The record of instructions shall be kept for at least six months.
4. The control rooms of the SLDC, Power Plants and EHV sub-stations and any other control centres of all State entities shall be manned and maintained round the clock by qualified personnel with adequate training.

5.2 System Security Aspects:

1. All Intra-state user(s) and all the other constituent participating in the State grid shall endeavour to operate their respective power systems and power stations in synchronous with each other at all times, such that the entire system within the State operates as one synchronized system.
2. No part of the grid shall be deliberately isolated from the rest of the State grid, except:
 - (i) Under an emergency, and conditions in which such isolation would prevent a total grid collapse and / or enable early restoration of power supply;
 - (ii) when serious damage to a costly equipment is imminent and such isolation would prevent it; and
 - (iii) when such isolation is specifically instructed by SLDC.

Complete synchronization of grid shall be restored as soon as the conditions again permit it. The restoration process shall be supervised by SLDC, as per operating procedures separately formulated.
3. Any tripping, whether manual or automatic, of any of the above elements of State grid shall be precisely intimated by the concerned intra state users to SLDC as soon as

possible. The reason (to the extent determined) and the likely time of restoration shall also be intimated.

4. All generating units, which are synchronized with the State grid irrespective of their ownership, type and size, shall have their governors in normal operation at all times. If any generator of over 50 MW rating is required to be operated without its governor in normal operation the SLDC shall be immediately informed about the reason and duration of such operation. All governors shall have a droop between 3% and 6%. All provisions related to Free Governor Action, shall be consistent with relevant provisions as provided in the IEGC specified by CERC under clause (h) of Section 79 of the Act and amended from time to time.
5. Facilities available in load limiters, automatic turbine run up system (ATRS), turbine supervisory control, coordinated control system, etc., shall not be used to suppress the normal governor action in any manner. No dead bands and/or time delays shall be deliberately introduced.
6. All generation units, operating at/up to 100% of their maximum continuous rating (MCR) shall normally be capable of (and shall not in any way be prevented from) instantaneously picking up five percent (5%) extra load for at least five (5) minutes or within technical limits prescribed by the manufacturer when frequency falls due to a system contingency. The generating units operating at above 100% of their MCR shall be capable of (and shall not be prevented from) going at least up to 105% of their MCR when frequency falls suddenly. Any generating unit of over fifty (50) MW size, not complying with the above requirement, shall be kept in operation (i.e., synchronized with the State grid) only after obtaining the permission of SLDC. However, the entity can make up the corresponding shortfall in spinning reserve by maintaining an extra spinning reserve on the other generating units of the entity.
7. The recommended rate for changing the governor setting, i.e. supplementary control for increasing or decreasing the output (generation level) for all generating units, irrespective of their type and size, would be one (1.0) percent per minute or as per manufacturer's limits. However, if frequency falls below 49.7 Hz or as decided by CERC from time to time, all partly loaded generating units shall pick up additional load at a faster rate, according to their capability.
8. Except under an emergency, or to prevent an imminent damage to personnel and equipment, no entity shall suddenly reduce his generating unit output by more than fifty (50) MW without prior intimation to, and consent of the SLDC, particularly when frequency is falling or is below 49.5 or as decided by CERC from time to time. Similarly, no entity shall cause sudden increase in its load by more than fifty (50) MW without prior intimation to and consent of the SLDC.
9. All generating units shall normally have their Automatic voltage regulator (AVRs) in operation, with appropriate settings. In particular, if a generating unit of over fifty (50) MW size is required to be operated without its AVR in service, the SLDC shall be immediately intimated about the reason and duration, and its permission obtained. Power System Stabilizers (PSS) in AVRs of generating units (wherever provided), shall be got properly tuned by the respective generating unit owner as per a plan prepared for the purpose by the CTU / STU from time to time. CTU / STU will be allowed to carry out checking of PSS and further tuning it, wherever considered necessary.
10. Provision of protections and relay settings shall be coordinated periodically throughout the State grid, as per a plan to be separately finalized by the STU in coordination with all entities.
11. All Intra-state user(s) shall make all possible efforts to ensure that the grid frequency always remains within the 49.5–50.2 Hz band as per IEGC, 2010 as amended from time to time. However, generator should have operating capability to give MCR output

under Grid Frequency Variation of -5% to +3% (47.5 to 51.5) as per CEA technical standard.

12. All Intra-state user(s) shall provide automatic under-frequency & df/dt load shedding in their respective systems, to arrest frequency decline that could result in a collapse/disintegration of the grid, as per the plan separately finalized by STU, and shall ensure its effective application to prevent cascaded tripping of generating units in case of any contingency. All State entities shall ensure that the under-frequency & Df/Dt load shedding/islanding schemes are functional and no under-frequency relay is by-passed or removed without prior consent of SLDC.
13. All Intra-state user(s) shall facilitate identification, installation and commissioning of the systems protection schemes (SPS) (including inter-tripping and run-back) in the power system to operate the transmission system closer to their limits and to protect against situations such as voltage collapse and cascade tripping, tripping of important corridors/flow-gates etc.. Such schemes would be finalized by the STU and shall always be kept in service. If any SPS is to be taken out of service, permission of SLDC shall be obtained indicating reason and duration of anticipated outage from service.
14. All generating units will ensure HT/LT by-pass arrangement wherever provided to be in service so, that at least one of the generator remaining in service for house load.
15. Procedures shall be developed by SLDC in consultation with RLDC to recover from partial/total collapse of the grid in accordance with CEA (Grid Standards) Regulation as and when the same comes into force and periodically update the same in accordance with the requirements given under section 5.8 of IEGC Regulation, 2010. These procedures shall be followed by all the Intra-state users, STU and, SLDC to ensure consistent, reliable and quick restoration.
16. The Intra-state user(s) and STU shall send information / data including disturbance recorder / sequential event recorder output etc., to SLDC for purpose of analysis of any grid disturbance / event. No Intra-state user(s) shall block any data/information required by the SLDC for maintaining reliability and security of the grid and for analysis of an event.
17. All Intra-state user(s), STU and SLDC shall make all possible efforts to ensure that the Steady state grid voltage always remains as follows as per IEGC, 2010:

Voltage - (kV rms)		
Nominal	Maximum	Minimum
765	800	728
400	420	380
220	245	198
132	145	122
33	36	30

The licensee shall design and operate a distribution system in conjunction with the transmission systems. The licensee shall not permit the voltage at the point of supply to the consumer to vary from the declared voltage which is:

- (a) In the case of low or medium voltage, by more than 6%; or
- (b) In the case of high voltage, by more than 6% on the higher side or by more than 9% on the lower side; or
- (c) In the case of extra high voltage, by more than 10% on the higher side or by more than 12.5% on the lower side.

Any exception to the above will only be allowed with the written consent of the consumer or with prior approval of the Commission.

18. Intra-state user shall ensure to maintain following temporary over voltage level due to sudden load rejection and voltage unbalance :-

S.No.	Nominal System Voltage (kV rms)	Phase to Neutral Voltage (kV peak)	Voltage unbalance (%)
1	765	914	1.5
2	400	514	1.5
3	220	283	2
4	132	170	3

The voltage unbalance i.e. difference of voltage between any two phases on 33 kV system should not exceed 3% at supply point.

19. All the consumer availing 3 phase supply shall balance their load in such a way that difference in loading between each phase does not exceed 5% of average loading between phases.
20. The maximum permissible limit of harmonics as specified in Institute of Electrical and Electronics Engineers (IEEE) standard 519 (1992) adopted in clause (5) of part-II of Central Electricity Authority (Technical standard of connectivity to the grid) Regulations 2007 (hereafter CEA (Technical Standard Regulations)) is as follows:

(a) Voltage distortion limit – Utilities responsibility

Bus Voltage	Maximum individual voltage distortion	Total maximum voltage distortion
33KV & 132 KV	3.0	5.0
220KV	2.0	2.5
400KV	1.5	2.0

(b) Current distortion – Intra-state users responsibility

The total harmonics distortion for current drawn from the transmission system at the connection point shall not exceed 8%.

21. 400/220 kV & 220/132 kV I.C.T's. tap operation will be done only after approval from SLDC. .
22. Any switching operation on 400 kV will be done after intimation & approval by WRLDC/SLDC as the case may be.
23. STU, transmission licensee shall provide adequate voltage control measures through voltage relay and shall ensure its effective application to prevent voltage collapse.
24. Hydro generators having capability to operate in condenser mode are required to do so under instructions from SLDC. Hydro generators having capability to operate in Pump mode are required to do so under instructions from SLDC.
25. SLDC shall make all out efforts to evacuate the available solar, small hydro and wind power and treat them as a must-run station. However, system operator may instruct the solar, small hydro and /wind generator to back down generation only on consideration of grid security or safety of any equipment or personnel is endangered and solar, small hydro and wind generator shall comply with the same. For this, Data Acquisition System facility shall be provided for transfer of information to SLDC.
26. SLDC may direct a wind generators to curtail its VAr draw/injection in case the security of grid or safety of any equipment or personnel is endangered.

27. During the wind generator start-up, the wind generator shall ensure that the reactive power drawl (inrush currents of induction generators) shall not affect the grid performance.

5.3 Demand Estimation for Operational Purposes:

- (a) The demand estimation both active power and reactive power is to be done on daily/weekly/monthly/yearly basis by SLDC for current year for load - generation balance planning. The SLDC shall carry out system studies for operational planning purposes using this demand estimate.
- (b) SLDC shall develop methodologies/mechanisms for estimation of daily/weekly/monthly/yearly demand estimation (MW, MVar and MWh). Based on this demand estimate and the estimated availability from different sources, SLDC shall plan demand management measures like load shedding, power cuts, etc. and shall ensure that the same is implemented by the distribution licensees. Distribution licensees shall abide by the demand management measures of the SLDC and shall also maintain historical database for demand estimation.
- (c) SLDC shall carry out demand estimation from the historical data and weather forecast data from time to time. Distribution licensees and other concerned persons shall provide relevant data and other information as required by SLDC for demand estimate.
- (d) The demand estimation for operational purposes is to be done on a daily/weekly/monthly basis by SLDC. Mechanisms and facilities at SLDC shall be created to facilitate on-line estimation of demand for daily operational use for each 15 minutes block.
- (e) The SLDC shall take into account the Solar and Wind Energy forecasting also to meet the active and reactive power requirement.

5.4 Demand Management:

This section is concerned with the provisions to be made by SLDC to effect a reduction of demand in the event of insufficient generating capacity, and inadequate transfers from external interconnections to meet demand, or in the event of breakdown or congestion in intra-state or inter-state transmission system or other operating problems (such as frequency, voltage levels beyond normal operating limit, or thermal overloads, etc.) or overdrawl of power vis-à-vis of the regional entities beyond the limits mentioned in UI regulation of CERC.

1. Demand Disconnection: -

- (i) The Intra-state user(s) shall endeavour to restrict their net drawal from the grid within their respective drawal schedules whenever the system frequency is below 49.7 Hz., When the frequency falls below 49.5 Hz., requisite load shedding (manual) shall be carried out to curtail the overdrawal. Such load shedding shall be pre-planned for each level of under frequency.
- (ii) Further, in case of certain contingencies and/or threat to system security, the SLDC may direct sub-stations to decrease its drawal by a certain quantum. Such directions shall immediately be acted upon.
- (iii) Each Intra-state user(s) shall make such arrangements as will enable manual demand disconnection to take place, as instructed by the SLDC, under normal and / or contingent conditions.
- (iv) The measures taken to reduce the Intra-state user(s) drawal from the grid shall not be withdrawn as long as the frequency/voltage remains at a low level, unless specifically permitted by the SLDC.
- (v) All Intra-state users, distribution licensee or bulk consumer shall comply with direction of SLDC and carry out requisite load shedding or backing down of generation in case of congestion in transmission system to ensure safety and reliability of the system. The procedure for application of measures to relieve

congestion in real time as well as provisions of withdrawal of congestion shall be in accordance with Central Electricity Regulatory Commission (Measures to relieve congestion in real time operation) Regulations, 2009 as amended from time to time.

2. Load Shedding Policy:

- i. In case of shortage of power availability with respect to demand, the SLDC shall resort to shedding on different load catering feeders on economic principle in consultation with DISCOM till the Commission specifies any policy/order in this regard.
- ii. In case of certain contingencies and/or threat to system security, the SLDC may direct any Intra-state user to decrease drawal of its control area by a certain quantum. Such directions shall immediately be acted upon.
- iii. SLDC will monitor and regulate the same.

5.5 Periodic Reports:

A weekly report shall be issued by SLDC to STU and shall cover the performance of the State grid for the previous week. The weekly report shall contain the following:

- (i) Frequency profile: maximum and minimum frequency recorded daily and daily frequency variation index (FVI);
- (ii) voltage profile: the voltage profile of selected sub-stations;
- (iii) major generation and transmission outages;
- (iv) transmission constraints; and
- (v) instances of persistent/significant non compliance of the Grid Code.

5.6 Other Reports:

The SLDC shall also prepare a quarterly report which shall bring out the system constraints, reasons for not meeting the requirements, if any of security standards and quality of service, along with details of various actions taken by different intra state users, and the intra state users responsible for causing the constraints. SLDC shall also prepare quarterly energy balance of STU, CSPDCL and other transmission licensee and submit to concern and the Commission.

5.7 Operational Liaison:

This section sets out the requirements for the exchange of information in relation to operations and / or events on the total grid system related to :

- i. the State grid;
- ii. inter-State links; and
- iii. the system of intra-State entity.

The above generally relates to notifying of what is expected to happen or what has happened. The operational liaison function is a mandatory built-in hierarchical function of the SLDC and Intra-state user(s), to facilitate quick transfer of information to operational staff. It will correlate the required inputs for optimization of decision-making and actions.

5.7.1 Procedure for Operational Liaison :

1. Operations and events on the State grid:

Before any operation is carried out on State grid, the SLDC will inform each entity, whose system may, or will experience an operational effect, and give details of the operation to be carried out. Immediately following an event in the State grid, the SLDC will inform each Intra-state user, whose system may, or will, experience an operational effect, following the event, details of what has happened in the event.

2. Operations and events on an Intra-state user(s) system:

Before any operation is carried out on an Intra-state user(s) system, the Intra-state user(s) will inform the SLDC, in case the State grid may, or will experience an operational effect, and give details of the operation to be carried out. Immediately following an event on the

Intra-state user(s) system, the Intra-state user(s) will inform the SLDC, in case the State grid may, or will, experience an operational effect following the event and give details of what has happened in the event. For recharging of tripped ICT 400/220 kV or 220/132 kV, the permission from the designated authority of STU shall be obtained by SLDC-

5.8 Outage Planning:

5.8.1 General:

1. This part sets out the procedure for preparation of outage schedules for the elements of the State grid in a coordinated and optimal manner keeping in view the State system operating conditions and the balance of generation and demand. List of elements of grid covered under these stipulations shall be prepared and be available with SLDC.
2. The objective of this sections are:
 - i. To produce a coordinated generation outage programme for the State grid, considering all the available resources and taking into account transmission constraints, as well as seasonal requirements.
 - ii. To minimize surplus or deficits, if any, in the system requirement of power and energy and help to operate the system within security standards.
 - iii. To optimize the transmission outages of the elements of the State grid without adversely affecting the grid operation but taking into account the generation outage schedule, outages of constituent systems and maintaining system security standards.
3. The generation output and transmission system should be adequate after taking into account the outages to achieve the security standards.
4. Outage planning is prepared in advance for the current year and reviewed during the year on quarterly and monthly basis.

5.8.2 Outage Planning Responsibilities:

1. The SLDC is responsible for analyzing the outage schedule given by all State entities, preparing a draft outage schedule for next year and establishment of final plan for current year by July of current year.
2. The outage plan will be reviewed by the STU.
3. Demand estimation is necessary for both long time scale to ensure adequate system plant margins and ratings and for short time scale to assist with frequency control. Discom shall provide to the STU their estimates of demand for the desired period on a year ahead, month ahead basis as required. Based on this, the STU shall make monthly peak and lean period demand estimates for the year ahead. STU shall use hourly generation summation figures and import/export figures to meet the demand estimation. Distribution companies shall provide to SLDC estimated load that may be shed, when required, in discrete blocks with the details of the arrangements of such load shedding. All data shall be collected in accordance with procedures agreed between the STU and each constituent. SLDC shall maintain a database of State demand on an hourly basis.

5.8.3 Outage Planning Process:

1. The STU and generating plants shall provide the SLDC their proposed outage programs in writing for the next year by the end of the month of August of the current year. These shall contain identification of each generation unit / line/ICT, the preferred date for each outage and its duration and where there is flexibility, the earliest start date and latest finishing date.
2. SLDC shall then come out with a draft outage program for the next year by the end of the month of September of the current year for the State grid taking into account the available resources in an optimal manner and to maintain security standards. This will be done after carrying out necessary system studies and, if necessary, the outage program

shall be rescheduled. Adequate balance between generation and load is to be ensured while finalizing outage program.

3. Transmission outage planning shall be harmonized with Generator outage planning and distribution system outage planning shall be harmonized with generation and transmission outage planning.
4. This next year plan shall be intimated to all Intra-state user(s) for implementation latest by the end of the month of January or by such earlier date as may be decided by STU.
5. This next year's plan shall be reviewed by SLDC/STU on quarterly and monthly basis in coordination with all parties concerned
6. In case of emergency in the system viz. loss of generation, break down of transmission line affecting the system, grid disturbance, system isolation, SLDC may conduct studies again before clearance of the planned outage.
7. SLDC is authorized to defer the planned outage in case of any of the following:
 - (i) Major grid disturbance;
 - (ii) system isolation;
 - (iii) black out in system of any constituent; and
 - (iv) any other event in the system that may have an adverse impact on the system security by the proposed outage.
8. Each intra-state user shall obtain the final approval from SLDC prior to availing an outage.

5.9 Recovery Procedures:

1. Detailed plans and procedures for restoration of the grid under partial / total black out shall be developed by SLDC in consultation with all intra-State users and shall be reviewed / updated annually.
2. Detailed plans and procedures for restoration of each constituent's system after partial / total black out within state, will be finalized by the concerned user in coordination with the SLDC.
3. List of generating plants with black start facility, inter-state synchronizing points and essential loads to be restored on priority, should be prepared and be available with SLDC.
4. The SLDC is authorized during the restoration process following a black out, to operate with reduced security standards for voltage and frequency as necessary in order to achieve the fastest possible recovery of the grid.
5. The recovery procedure shall be reviewed, confirmed and/or revised once every subsequent year. Training programs including workshops and simulation exercises of the procedure for different sub-systems may be carried out by the State Load Despatch Centre, in coordination and consultation with Intra-state users and Transmission Licensees.
6. All communication channels required for restoration process shall be used for operational communication only, till grid normalcy is restored.

5.10 Event Information:

This part deals with reporting procedures in writing of reportable events in the system to all Intra-state user(s) and SLDC. The objective of this section is to define the incidents to be reported, the reporting route to be followed and information to be supplied to ensure consistent approach to the reporting of incidents/events.

5.10.1 Responsibility:

Any tripping of generating unit or transmission element of intra-State transmission system should be reported by Intra-state user to SLDC along with relay indication in addition to reportable events. The SLDC shall be responsible for reporting events to the STU. All Intra-state users shall collect necessary data for reporting to SLDC for monitoring and event analysis.

5.10.2 Reportable Events:

Events effecting a generator capacity or a load of more than (200) MW shall be reported by State Load Despatch Centre along with brief detail of the event to the STU:

- (i) Violation of security standards.
- (ii) Operational Indiscipline.
- (iii) Non-compliance of instructions.
- (iv) System islanding / system black out.
- (v) State black out / partial system black out.
- (vi) Major protection failure.
- (vii) System instability.
- (viii) Tripping of any element of the EHV State grid.
- (ix) Major Equipment failure.

5.10.3 Reporting Procedure:

(i) **Written reporting of events by intra-State entities to SLDC.**

In the case of an event which was initially reported by an intra state user to SLDC orally, the user will give a written report to SLDC in accordance with provision of this section.

(ii) **Written reporting of events by SLDC to intra-State users**

In the case of an event which was initially reported by SLDC to a user orally, the SLDC will give a written weekly report to the user in accordance with this section.

5.10.4 Form of Written Reports:

A written report shall be sent to SLDC or a Intra-state user(s), as the case may be, and will confirm the oral notification together with the following details of the event:

- (i) Time and date of event.
- (ii) Location
- (iii) Plant and / or Equipment directly involved
- (iv) Description and cause of event
- (v) Demand and / or Generation (MW) interrupted and duration
- (vi) All relevant system data including copies of records of all recording instruments including Disturbance Recorder, Event Logger, DAS etc.,
- (vii) Sequence of trippings with time.
- (viii) Details of Relay Flags.
- (ix) Remedial measures.

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CHAPTER - 6**SCHEDULING AND DISPATCH CODE**

6.1 This section deals with the procedures to be adopted for scheduling of the net injection / drawals of concerned intra-state users on a day ahead basis with the modality of the flow of information between the SGS/ InSGS/ SLDCs/ beneficiaries/ bulk consumer and other intra-state users. The procedure is specified for submission of capability declaration (Injection schedule) by each SGS/InSGS and submission of requisition / drawal schedule by beneficiary/bulk consumers and other intra-state users so as to enable SLDC to prepare the despatch schedule for SGS /InSGS and drawal schedule for each intra-state user. It also provides methodology of issuing real time despatch/drawal instructions and rescheduling, if required, to intra-state users along with the commercial arrangement for the deviations from schedules, as well as, mechanism for reactive power flow:

These guidelines are applicable to STU, SLDC and transmission licensee. These guidelines are also applicable to following users availing long-term and medium-term intra-State open access:

- a) State generating station
- b) Intra-state generating station (other than renewable based generating plant) c) Central sector generating plants located in the State as specified in clause no. 6.4 in CERC (Indian Electricity Grid Code) Regulations, 2010,
- d) Beneficiaries
- e) Bulk consumers

The scheduling and dispatch procedure specified in this code shall not be applicable to the any users availing short-term intra-state or short term inter state open- access but shall be applicable to intra state long and medium term open access customer. Long, medium and short –term inter-State open access shall be regulated by IEGC and CERC inter-state open access regulation as amended from time to time. For drawal of power from central sector generating station and for transfer of power to inter-state grid SLDC shall follow IEGC and co-ordinate with WRLDC.

6.2 Responsibility of Scheduling and Dispatch

6.2.1.SLDC shall have the total responsibility for

- (i) Scheduling/ dispatching of state generating station;
- (ii) Scheduling drawal from the ISGS (within their share in the respective plant's expected capability);
- (iii) Regulating the demand of the beneficiaries in the State;
- (iv) Regulating the bilateral /collective interchanges, if any;
- (v) Regulating the net drawal of their control area from the regional grid in accordance with respective regulation of the CERC;
- (vi) Regulate the injection / drawal of open access customer connected with State grid.
- (vii) Regulate InSGS
- (viii) To maintain the State UI account / collection and disbursement of UI payment of users/Intra State users.
- (ix) To maintain State Energy Accounts.

6.2.2.The beneficiaries through SLDC shall always endeavor to restrict its net drawal from Central generating stations and other generating plants within their respective drawal schedules.

6.2.3.The State generating station, InSGS shall be responsible for power generation generally according to the daily schedule advised to them by the SLDC on the basis of the drawal schedules received from the beneficiaries/bulk consumers. However, the generating plants may deviate from the given schedules depending on the plant and system conditions. In particular, they would be allowed / encouraged to generate beyond the given schedule under deficit conditions. Deviations from the ex-bus generation schedules shall be appropriately priced by Commission.

Provided that when the frequency is higher than 50.2 Hz, the actual net injection shall not exceed the scheduled dispatch for that period. Also while the frequency is above 50.2 Hz, the generating plants may (at their discretion) back down without waiting for an advice from SLDC to restrict the frequency rise. When the frequency falls below 49.7 Hz, the generation at all stations (except those on peaking duty) shall be maximized, at least up to the level which can be sustained, without waiting for an advice from SLDC. Notwithstanding the above, the SLDC may direct the generating plants/beneficiaries to increase/decrease their generation/drawal in case of contingencies e.g. overloading of lines / transformers, abnormal voltage, threat to system security. Such directions should immediately be acted upon.

6.2.4. The concerned distribution licensee , intra-State user and SLDC shall ensure that their automatic demand management scheme acts to ensure that there is no over drawal when frequency is 49.5 Hz or below. If the automatic demand management 56

scheme has not yet been commissioned, then action has to be taken as per manual demand management scheme to ensure zero over drawal when frequency is 49.5 Hz or below.

6.2.5. For all outages of generation and transmission system, which may have an effect on the State grid, all users shall cooperate with each other and coordinate their actions as per the procedures finalized separately. In particular, outages requiring restriction of generation which beneficiary can receive (and which may have a commercial implication) shall be planned carefully to achieve the best optimization.

6.2.6. The open access customers/intra-State users shall furnish to the SLDC all requisite information for billing purposes.

6.2.7. All intra-state user(s) shall abide by the concept of frequency-linked load dispatch and pricing of deviations from schedule i.e. unscheduled interchanges (ABT & UI Regulation of the State). All intra state user(s) shall normally be operated according to the standing frequency linked load dispatch guidelines issued by the SLDC to the extent possible, unless otherwise advised by the SLDC except the generators exempted by the Commission by an order or regulations.

6.2.8. Scheduling and dispatch of such long-term or medium-term open access costumers which import and/or export power to the extent of more than 1MW will be subject to scheduling and dispatch by the SLDC in case of intra state transaction except the generators exempted by the Commission by an order or regulations.

The SLDC/STU /Distribution Licensees shall regularly carry out the necessary exercises regarding short-term demand estimation for their respective States/area, to enable them to plan in advance as to how they would meet their consumers' load without overdrawing from the grid.

6.3 Scheduling and Dispatch Procedure

1. The State generating stations ,intra-State sellers in the State shall advise the SLDC, By 9 AM every day, the station-wise ex-power plant MW and MWh capabilities foreseen for the next day, i.e., from 0000 hrs to 2400 hrs of the following day.
2. The above information of the foreseen capabilities of the State generating stations, InSGS and the information received from WRLDC regarding the MW and MWH entitlements from Central generating stations for different hours for the next day of beneficiary and bulk consumers, shall be compiled by the SLDC 57 every day for the next day, and advised to beneficiaries /bulk consumers by 11AM.
3. By 2 pm every day the State generating stations ,InSGS,beneficiary and bulk consumer shall advise the SLDC for changes if on the above provided schedule.

6.4 By 8 PM each day, the SLDC shall convey:

- (a) The ex-power plant “despatch schedule” to each of the the State generating stations and InSGS, in MW for different time block, for the next day. The summation of the ex-power plant drawal schedules advised by beneficiaries/bulk consumer shall constitute the ex-power plant station-wise despatch schedule.
- (b) The “net drawal schedule” to each beneficiary/bulk consumer, in MW for different time block, for the next day. The summation of the station-wise ex-power plant drawal schedules from State generating stations ,InSGS and drawal from /injection to State grid consequent to other long term access, medium term and short-term open access transactions, after deducting the transmission losses (estimated), shall constitute the beneficiary/bulk consumer drawal schedule.

6.5 The State generating stations, InSGS, beneficiary and bulk consumer shall inform any modifications/changes to be made in Dispatch/drawal schedule foreseen capabilities, if any, to SLDC by 10 PM or preferably earlier.

6.6 While finalizing the above daily generation schedules for the generating stations, the SLDC shall ensure that the same are operationally reasonable, particularly in terms of ramping-up / ramping – down rates and the ratio between minimum and maximum generation levels.

6.7 The SLDC shall inform the final dispatch/drawal schedule for the next day to State generating stations ,intra-State sellers, beneficiary and intra-state buyer for the next day by 11:00 PM.

6.8 In the event of bottleneck in evacuation of power due to any constraint, outage, failure or limitation in the transmission system, associated switchyard and substations owned by the State Transmission Utility or any other transmission licensee involved in intra-State transmission (as certified by the SLDC) or distribution licensee necessitating reduction in generation, the SLDC shall revise the schedules which shall become effective from the 4th time block, counting the time block in which the bottleneck in evacuation of power has taken place to be the first one. Also, during the first, second and third time blocks of such an event, the scheduled generation of the generators (including CGP) shall be deemed to

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have been revised to be equal to actual generation, and the scheduled drawals of the beneficiaries/buyers shall be deemed to have been revised accordingly.

In case of any grid disturbance, scheduled generation of all the generating station (including CGP) and scheduled drawal of all the beneficiaries/buyers shall be deemed to have been revised to be equal to their actual generation/drawal for all the time blocks affected by the grid disturbance. Certification of grid disturbance and its duration shall be done by the SLDC.

Generation schedules and drawal schedules issued/revised by the State Load Despatch Centre shall become effective from designated time block irrespective of communication success.

6.9 While finalizing the drawal and dispatch schedules as above, the SLDC shall also check that the resulting power flows do not give rise to any transmission constraint. In case any impermissible constraints are foreseen, the SLDC shall moderate the schedules to the required extent, under intimation to the concerned intra-state users.

6.10 On completion of the operating day, by 24.00 hours, the schedule finally implemented (including PAF in case of State generating station) during the day, taking into account all before the fact changes in dispatch schedule of generating stations and drawal schedule of the beneficiary/bulk consumer, shall be issued by SLDC. In case of any mistake / omission is detected / noticed in the schedule within 3 days of publication on SLDC website, the SLDC shall check and rectify the same. This schedule shall be the datum for commercial accounting. The average ex-bus capability for each of the generating stations shall also be worked out based on all before-the-fact advice to SLDC.

6.11 The SLDC shall properly document all the above information i.e. station-wise foreseen ex-power plant capabilities advised by the State generating stations, InSGS and the drawal schedule indented by the beneficiaries/bulk consumers, all schedules issued by the SLDC, and all revisions/updating of the above.

6.12 Bio-mass, small hydel, wind, solar and bagasse base power station installed in State and who are supplying power to any distribution licensee of the state shall continue to supply power as per orders of the Commission, in force.

6.13 For all generators under inter-state ABT scheme, CERC Regulations will be applicable for scheduling and commercial settlement of UI charges.

6.14 SLDC shall monitor and maintain a record of deviation from the generation schedule. The applicable rates shall be paid by the intra-State user(s) to the concerned as per the 59 open access regulations issued by the Commission or as per the terms and condition of the PPA as the case may be.

Revision of declared capability by the SGS(s)/InSGS having two part tariff with capacity charge and energy charge(except hydro stations) and requisition by beneficiary(ies)/bulk consumers for the remaining period of the day shall also be permitted with advance notice. Revised schedules/declared capability in such cases shall become effective from the 6th time block, counting the time block in which the request for revision has been received in the SLDC to be the first one.

6.15 To discourage frivolous revisions, SLDC may, at its sole discretion, refuse to accept schedule/capability changes of less than two (2) percent of previous schedule/capability. The schedule of thermal generating stations indicating fuel shortage while intimating the Declared Capacity to the RLDC shall not be revised except in case of forced outage of generating unit.

- 6.16 SLDC shall periodically review the actual deviation from the dispatch and net drawal schedules being issued, to check whether any of the intra-state user are indulging in unfair gaming or collusion. In case any such practice is detected, the matter shall be reported to the RPC and CSERC for further investigation/action.
- 6.17 The SGS / InSGS User shall be required to demonstrate the declared capability of its generating station at the grid interface point, as and when asked by the State Load Despatch Centre. In the event of the intra-state user failing to demonstrate the declared capability, the capacity charges due to the generator shall be reduced as a measure of penalty.

6.18 Day ahead schedule by licensee:

Day ahead transactions shall be permitted, in case there is availability of surplus capacity in the licensee system, which has been expressly surrendered whole or part thereof, or not in use for more than three days in past.

An application for grant of such open access may be submitted to SLDC within three days prior to the date of scheduling but not later than 1300 hrs of the day immediately preceding the day of scheduling for day ahead transaction.

For example, application for day-ahead transaction on 25th day of July shall be received on 22nd day or 23rd day or up to 1300 hours on 24th day of that month.

Nodal agency shall check for congestion and convey grant of approval or otherwise, in the format as approved in detailed procedure. All other provisions of application for short-term open access shall apply.

6.19 Reactive Power And Voltage Control:

1. Regarding VAR drawal/absorption from the State grid, the SLDC has to follow IEGC. The VAR consumption below 97% voltage and VAR injection above 103% of the rated voltage shall be avoided.
 2. All the distribution licensees, transmission licensees and STU are expected to provide local VAR compensation such that they do not draw VARs from the EHV grid. VAR compensation has to commence in the following order.
 - i. Consumer end
 - ii. Distribution transformer end.
 - iii. At the 33/11 KV substations or 11kV distribution feeders
 - iv. EHV Sub-stations
 - v. Generating stations
 3. Tap changing on all 400/220 KV ICTs shall be done as per the instructions of SLDC.
 4. The generating stations excluding CGP shall generate/absorb reactive power as per instructions of SLDC, within the capability limits of the respective generating units. No payments shall be made or billed to the generating companies for such VAR generation/absorption.
 5. VAR compensation shall be applied so as to maintain EHV bus power factor 0.98 and above.
- 6.20 Non-compliance of Operational Issues**
- (i) SLDCs shall report to the Commission instances of serious or repeated violation of any of the provisions of the State grid Code and incidences of persistent non-compliance of the directions of the SLDCs issued in order to exercise supervision and control required for ensuring stability of grid operations and for achieving the maximum economy and efficiency in the operation of the power system in the state.
 - (ii) The Commission may initiate appropriate proceedings upon receipt of report of SLDCs referred to in (i) above
 - (iii) In case of non-compliance of any provisions of the State Grid Code by, SLDC or any other person the matter may be reported by any person to the CSERC.

- (iv) Notwithstanding anything contained in these regulations, the Commission, may also take *suo-motu* action against any person, in case of non-compliance of any of the provisions of the State grid Code

6.21 Non-Payment of Dues

In case of non-payment or any abnormal delay in payment of open access charges, unscheduled interchange charges, etc. by any intra-State user(s)/open access customer the affected parties shall report the matter to the Commission for appropriate direction.

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CHAPTER - 7 PROTECTION CODE

7.1 General Principles

Protection standards are treated as interface issues because of the possible severe inter-user boundary repercussions of faults that occur in the system of any entity. Minimum protection requirements are prescribed in this section because inadequate protection or mal-operation of protection system of any entity may result in far reaching consequences, disturbances and even damages in the systems of other entities.

No item of electrical equipment shall be allowed to remain connected to the system unless it is covered by the appropriate protection aimed at reliability, selectivity, speed and sensitivity. The provision mentioned in CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulation, 2010 shall be adhered to. All the generating companies and the distribution licensees shall cooperate with the transmission licensee to ensure correct and appropriate settings of protection to achieve effective, discriminatory isolation of faulty line / equipment within the fault clearance times as specified in clause 7.4 of this code.

All intra-state users need to co-operate to ensure correct and appropriate settings of protection to achieve effective, discriminatory removal of faulty equipment within the time for target clearance specified in this section.

Protection settings shall not be altered, or protection system bypassed and/or disconnected without consultation and agreement of all affected intra-state users. In the case where protection is bypassed and/or disconnected temporarily by agreement, then the cause must be rectified and the protection restored to normal condition as quickly as possible. If agreement has not been reached, the electrical equipment will be removed from service forthwith.

7.2 STU shall comply the instructions and advices of WRPC regarding:

1. Planning for upgrading and strengthening of protection system based on analysis of grid disturbance and partial/total blackout in State transmission system.
2. Planning of islanding and system split schemes and installation of under frequency relays and df/dt relays.
3. Installation of under-frequency relay for load shedding, relays provided for islanding scheme, disturbance recorder and fault locator installed at various sub-stations shall be tested and calibrated. The protection practices and Protocol Manual shall have provision for the same.

7.3 Protection Co-ordination

Intra-state users shall take prompt action to correct any protection malfunction as directed by SLDC. The settings of protective relays starting from the generating unit upto the remote end of 132 kV/ 33kV and 11 kV line shall be such that only the faulty section is isolated under all circumstances. The transmission licensee shall notify the initial settings and any subsequent changes to the intra-state users from time to time. Routine checks on the performance of the protective relays shall be conducted and malfunction, if any, shall be noted and corrected as soon as possible. The transmission licensee shall conduct the required studies for deciding the relay settings, with the data collected from the intra-state users. Representatives of all the intra-

state user(s) shall meet periodically to discuss such malfunctions, changes in the system configuration, if any, and possible revised settings of relays.

The transmission licensee shall be responsible for arranging periodical meetings with the generating companies and the distribution licensees to discuss coordination of protection. The transmission licensee shall investigate any malfunction of protection or other unsatisfactory protection issues. The concerned licensees shall take prompt action to correct any protection malfunction or issue as discussed and agreed to in these periodical meetings.

7.4 Fault Clearance Times & Short-Time Ratings

From a stability consideration, the minimum short circuit current rating and time and the maximum fault clearance times for faults on any intra-state user's system directly connected to the State transmission system, or any faults on the State transmission system itself, are as follows with reference to CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulation, 2010 and CEA Grid Standards Regulation, 2010 :

Nominal Voltage	Minimum Short Circuit current rating and duration of Switchgear		Maximum rated break time for CB	Target Fault clearance Time by primary protection
KV	kA (rms)	Second(s)	m.sec.	m.sec.
765 kV	40 or 50	1	40	100
400kV	40 or 50	1	40	100
220kV	40	1	60	160
132kV	31.5	1 or 3	100	160

Slower fault clearance times for faults on a intra-state user's system may be agreed to but only if, in STU's opinion, system conditions allow this. STU shall specify the required opening time and rupturing capacity of the circuit breakers at various locations for STU and Discoms/ open access customers directly connected to transmission system. The rated rupturing capacity of the circuit breakers in any Sub-station shall not be less than 120% of the maximum fault levels at the sub-stations. (The 20% margin is intended to take care of increase in short circuit levels as the system grows). At generating stations, line faults should be cleared at the generation station end, within the critical clearing time, for the generators to remain in synchronism.

7.5 Generator Protection Requirements

The guidelines mentioned in the "Manual on protection of Generators, Generator Transformers, and 220 kV and 400 kV networks" vide publication no 274 of CBIP shall be kept in view and CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulation, 2010 as amended from time to time should be followed. All generating units and all associated electrical equipment of the generating units connected to the State transmission system shall be protected by adequate protection so that the State Transmission System does not suffer due to any disturbances originating from the generation unit. The generator protection schemes shall cover at least differential protection, back up protection, stator earth fault protection, field ground/field failure protection (not applicable to brush-less excitation system), negative sequence protection, under frequency, over flux protection, back-up impedance protection and pole slipping protection (applicable to units above 200MW), loss of field protection, reverse power protection etc. The list of Electrical Protection Function of generating plant should be followed which is specified in CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulation, 2010.

7.6 Transmission Line Protection Requirements

7.6.1 General

Every EHV line taking off from a Power Station or a sub-station shall have protection and back up protection as mentioned below. STU shall notify intra-state users of any changes in its policy on protection from time to time.

Relay panels for the protection of lines of STU taking off from a power generating station, shall be owned and maintained by the generator. Any transmission line related relay settings or any change in relay settings will be carried out by the generator in close co-ordination and consultation with STU and with the later approval. Carrier cabinets / equipment, line matching units including wave traps and communication cable shall be owned and maintained by STU charges for which shall be collected or approved by the Commission. All generators shall provide space, connection facility, and access to STU for such purpose as applicable.

All Intra-state users shall also facilitate identification, installation and commissioning of System Protection Schemes (SPS) (including inter-tripping and run-back) in the power system to operate the transmission system closer to their limits and to protect against situations such as voltage collapse and cascade tripping, tripping of important corridors/flow-gates etc. If any SPS is to be taken out of service, permission of SLDC shall be obtained indicating reason and duration of anticipated outage from service.

7.6.2 400kV transmission lines

All 400kV transmission lines shall have two fast acting protection schemes, the voltage of the two relays shall be fed from two different cores of the line CVT and the currents of the two relays shall be fed from two different cores of the line CTs. Main 1 protection scheme shall be numerical, three zone, non-switched fast acting distance protection scheme with permissible inter-trip at remote end (in case of zone-2 fault)

Main 2 protection scheme shall be either similar type of numerical, three zone, non-switched fast acting distance protection scheme with permissible inter-trip at remote end (in case of zone-2 fault) OR a unit protection scheme employing transient wave detection, directional comparison or phase comparison carrier relaying scheme.

One pole tripping and single shot auto-reclosing with adjustable dead-time shall be provided.

Over voltage relay for steady state and transient over voltage rise will have to be installed.

400kV and 220kV system will invariably be provided with breaker back up protections.

400kV line /220 kV lines protection will have inter trip arrangement through carrier so that tripping at one end of line is transmitted to other end also.

7.6.3 400kV Bus-bars

All 400kV sub-station shall have bus bus-bar differential protection scheme along with “Local Breaker Backup (LBB)” and auto-reclosures for transmission lines.

7.6.4 220kV transmission lines

All 220kV transmission lines shall have single, numerical, three zone, non-switched fast acting distance protection scheme, preferably with permissible inter-trip feature at remote end (in case of zone-2 fault), single pole tripping and single-shot single pole autoreclosing with adjustable dead-time shall be provided.

For back-up protection, three directional IDMT over current relays and one directional earth fault relay shall be provided.

For short transmission lines, appropriate alternative protection schemes may be adopted.

7.6.5 220kV Bus-bars

Identified important 220kV sub-station (e.g. having generation infeed, PGCIL interfacing substation etc.) shall have bus bus-bar differential protection scheme along with LBB and autoreclosures for transmission lines.

7.6.6 132kV Lines

A single three zone, switched/non-switched static distance protection scheme shall be provided as main protection. The backup protection shall be at least two directional IDMTL over current relays and one directional earth fault relay.

For short transmission line, appropriate alternative protection schemes may be adopted.

7.7 Transformer Protection Requirements

- (i) The protections of Auto Transformers, Power Transformers and Distribution Transformers shall be in accordance with CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulation, 2010 and its amendments:
- (ii) All windings of Auto Transformers and power transformer of EHT class shall be protected by differential relays having percent bias and harmonic restraint features.
- (iii) Over-fluxing relays shall be provided for EHT transformers.
- (iv) All 400kV / 220kV class transformers shall have Restricted Earth Fault (REF) protection for winding. In case of 132kV transformer, it is optional.
- (v) In addition, there shall be back up Inverse definite minimum time (IDMT) over current and earth fault protection.
- (vi) For parallel operation, such back up protection shall have directional feature. For protection against heavy short circuits, the over current relays should incorporate a high set instantaneous element, wherever overall co-ordination permits the same. However, it should not trip due to inrush of the magnetising current and should not be set to such a high value, which is not beneficial to transformer.
- (vii) In addition to electrical protection, gas operated relays, winding temperature protection and oil temperature protection shall be provided.
- (viii) It is recommended that the following minimum protections should be provided for transformers:
 - (a) All 400kV class power transformers shall be provided with differential, REF, open delta (Neutral Displacement Relay) and over-fluxing relays. In addition, there shall be back up IDMT over current and earth fault protection. For parallel operation, such back up protection shall have inter-tripping of both HT and LT breakers. For protection against heavy short circuits, the over current relays should incorporate a high set instantaneous element. In addition to electrical protection, transformer own protection viz. buchholz, over load tap changer (OLTC) oil surge, gas operated relays, winding temperature protection, oil temperature protection, Pressure relief valve (PRV) device shall be provided for alarm and trip functions. It is recommended to have Double PRV protection scheme for transformer tank.
 - (b) All 220kV class power transformers shall have same protections as mentioned in Sections as mentioned in 8. (i) except REF protection.
- (ix) Delta tertiary winding of ICT if used for loading purpose shall be adequately protected by a Lightning Arrestor, surge capacitor and neutral displacement relay (NDR) protection connecting as open delta winding of Potential Transformer (PT).

7.8. **Local breaker backup protection (LBB):-** In the event of any circuit breaker failing to trip on receipt of trip command from protective relay, all circuit breakers connected to the bus section to which the faulty circuit breaker is connected are required to be tripped with minimum possible delay through LBB protection. This protection also provides coverage for faults between the circuit breaker and the current Transformer, which are not covered by other protections. All 220kV and 400kV circuits shall have Local Breaker Backup Protection and also in important 132 kV circuit.

7.9. Disturbance Recorders Event Loggers and Time Synchronization Equipment :-

Each 765kV, 400 kV line shall be provided with facility for disturbance recording, distance to fault locator and time synchronising equipment (TSE). Event logger either stand alone or as part of sub-station or switchyard automation system shall be provided for each 220kV and higher voltage class sub-station or switchyard. TSE complete with antenna, all cables,

processing equipment etc., shall be provided to receive synchronizing pulse through global positioning system (GPS) compatible for synchronization of event logger, disturbance recorder and SCADA/automation system of the sub-station or switchyard.

7.10. **Transformer Protection in distribution systems:** For smaller transformers of HV class on distribution system, differential protection shall be provided for 10 MVA capacity and above along with backup time lag over current and earth fault protection with directional feature for parallel operation. Transformers of 1.6 MVA capacity and above but less than 10 MVA shall be protected by time lag over current, earth fault and instantaneous restricted earth fault relays. In addition, all

Transformers of 1.6 MVA and above shall be provided with Buchholtz relays, winding and oil temperature protection.

7.11. **Distribution Lines Protection :** All the 33KV and 11 KV lines at Connection points/ interface points shall be provided with a minimum of over current and earth fault relays as follows:-

- (i) **Plain Radial Feeders:** Non-directional over current and earth fault relays with suitable settings to obtain discrimination between adjacent relay settings.
- (ii) **Parallel / Ring Feeders:** Directional time lag over current and earth fault relay.

7.12. **Sub-Station earthing :-** The earthing system shall be designed for a life expectancy of at least forty (40) years and for maximum system fault current or 40 kA for 1.0 sec, whichever is higher. The minimum rate of corrosion of steel used for earthing conductor shall be considered as 0.12 mm per year while determining the conductor size. Grounding and lighting protection for the entire Station shall be provided in accordance with relevant IS (Indian Standard)/ IEEE (Institute of Electrical and Electronics Engineers) Standards.

7.13. Schedule of protection details for protection of Transmission lines, Transformers, Reactors and Bus Bars is given here under as specified in CEA (Technical Standards for Construction of Electrical Plants and Electric Line) Regulation, 2010 69

Protection Details of Transmission Lines, Transformers, Reactors and Bus Bars 1.
Transmission Line Protection

Sl. No.	Protection	765 kV	400 kV	220 kV	132 kV or 66 kV
(a)	Main I- Distance protection	Y	Y	Y	Y
(b)	Main I- Distance protection or directional comparison protection or phase segregated line differential protection	Y	Y	Y/N	Y
(c)	Directional instantaneous definite minimum time (IDMT) type earth fault relay	Y	Y	'Y' if both main-I & main-II are distance protections otherwise 'N'	N
(d)	Directional IDMT over current and earth fault back up protection	N	N	'Y' if main-II is not provided otherwise 'N'	Y
(e)	Two stage over voltage protection	Y	Y	N	N

(f)	Auto reclosing	Y (Single phase and three phase)	Y (Single phase and three phase)	Y (Single phase and three phase)	Y (Three phase)
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Note :

- (1) Y - Required ; N - Not required; Y/N - Optional
- (2) Transmission lines with distance protection shall, in general have carrier aided inter-tripping or blocking feature. Separate cores of current transformer and voltage transformer shall be used for main-I and main-II.

2. Transformer Protection

Sl. No.	Protection	765 kV	400 kV	220 kV or 132 kV	66 kV
(a)	Differential protection	Y	Y	Y	Y
(b)	Over fluxing protection	Y	Y	Y	N
(c)	Restricted earth fault (REF) protection	Y	Y	Y	Y
(d)	Backup directional over current and earth fault protection (HV and LV side or impedance protection)	Y	Y	Y	Y
(e)	Buchholz WTI and OTI (for 1 MVA and above), MOG with low oil level alarm, OSR for OLTC, PRD, SA on both primary and secondary side of transformers located outdoors and connected to over head lines	Y	Y	Y	Y
(f)	Tertiary winding protection	Y	Y	Y (above 100 MVA rating)	Y
(g)	Over load alarm	Y	Y	Y	N

Note :

- (1) Y - Required ; N - Not required.
- (2) WTI winding temperature indicator; OTI- oil temperature indicator; OLTC or load tap changer; PRD pressure relieve device; OSR- oil surge relay; MOG- magnetic oil gauge; SA- surge arrester.

3. Reactor Protection

Sl. No.	Protection	765 kV	400 kV
(a)	Differential protection	Y	Y
(b)	REF protection	Y	Y
(c)	Reactor backup protection (impedance type or definite time over current (O/C) and earth fault (E/F) protection)	Y	Y
(d)	Buchholz, WTI, OTI, MOG with low oil level alarm, SA (if required)	Y	Y

Note :

(1) Y -

Required.

(2) WTI winding temperature indicator; OTI- oil temperature indicator; MOG- magnetic oil gauge; SA- surge arrester.

7.14. **Bus Bar Protection and Local Breaker Backup Protection** - Bus bar protection and local breaker backup protection shall be provided in 220 kV and higher voltage interconnecting sub-stations as well as in all generating station switchyards. The bus bar protection scheme shall have provision for future expansion.

7.15. **Sub-station Fire Protection**

Adequate precautions shall be taken and protection shall be provided against fire hazards to all apparatus of the intra-state users conforming to relevant Indian Standard Specification and /or provisions of CEA (Technical Standards for Construction of Electrical Plants and Electric Line) Regulation, 2010 and CEA (Measures Relating to Safety and Electric Supply) Regulations, 2010.

7.16. **Calibration & Testing**

The protection scheme shall be tested at each 400kV, 220kV, 132kV sub-station by STU once in a year or immediately after any major fault, which ever is earlier. Setting, co-ordination, testing and calibration of all protection schemes pertaining to generating units/stations shall be responsibility of individual concern.

7.17. **Data Requirements**

Intra-state users shall provide STU with data for protection purpose as specified in the Data Registration section.

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CHAPTER - 8 METERING CODE

8.1 **General Principles**

8.1.1 The scope of this part of the grid code covers the practices that shall be employed and the facilities that shall be provided for the measurement and recording of various parameters of electricity like active/reactive/apparent power/energy, power factor, voltage, frequency etc.

8.1.2 This Code sets out or refers to the requirements of metering at generating stations, sub-stations and interfaces for main meter, check meter, standby meter, consumer meter (tariff meter), and for energy accounting and audit meter as specified in the CEA (Installation and Operation of Meter) Regulations, 2006 as amended from time to time. 8.1.3 This Code also specifies the requirement for calibration, testing and commissioning of metering equipments viz. energy meters with associated accessories, current transformers and voltage transformers. The code broadly indicates the technical features of various elements of the metering, data communication, testing and calibration system, the procedure for assessment of consumption in case of defective and stuck-up meters and also lays down guidelines for resolution of disputes between different agencies.

8.1.4 The generating plants supplying power to the open access consumer, will be required to provide the metering as per ABT scheme and ABT compliant meters will be installed at both ends i.e. at injection point and drawal point .

8.1.5 In case Intra-state users / Open access customers/consumers provide the meters it shall have to provide software for billing to licensee and for operation to SLDC with communication facility for transfer of real time data through v-set or through lease line.

8.2 **Reference Standards**

8.2.1 The following Indian Standards (as amended to date) shall be applicable as relevant to meters and associated equipment:-

S.No.	Standard Number	Standard Title
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(i)	IS 13779	AC Static Watt-hour Meters for Class 1 and 2
	IS 14697	AC Static Transformer Operated Watt-hour and VAr-hour Meters, Class 0.2S and 0.5S
	IS 2705	Indian Standard for Current Transformers
	IS 3156	Indian Standard for Voltage Transformers
	IS 9348	Indian Standard for Coupling Capacitors and Capacitor Divider
	IS 5547	Indian Standard for Capacitor Voltage Transformer
(ii)	CBIP Technical Report - 88	Specification for AC Static Electrical Energy Meters
(iii)	CBIP Technical Report - 111	Specification for Common Meter Reading Instrument
(iv)	IS 9000	Basic Environmental Testing Procedures for Electronic & Electrical items
(v)	IS 12063	Indian Standard for classification of degrees of protection

8.2.2 The following International Standards (as amended to date) can be applicable as relevant to meters and associated equipment not complying to Indian Standards or not manufactured in India:

S. No.	Standard Number	Standard Title
i.	IEC 687	Specification for AC Static Watt-hour Meters for Active Energy (Classes 0.2S and 0.5S)
ii.	IEC 1036	Alternating Current Static Watt-hour Meters for Active Energy (Classes 1 and 2)
iii	IEC 1268	Alternating Current Static Watt-hour Meters for Reactive Energy (Classes 2 and 3)

8.3 Facility to be provided on Metering Locations

The intra-state user(s) where ever applicable shall make available the required space to facilitate installation of meters and associated equipment.

8.4 Application of metering system (ownership and location) - Ownership and location of meter shall be as below :-

- 8.4.1 (a) All interface meters installed at the points of interconnection with Inter-State Transmission System (ISTS) for the purpose of electricity accounting and billing shall be owned by CTU.
- (b) All interface meters installed at the points of interconnection with Intra-State Transmission System excluding the system covered under sub-clause (a) above for the purpose of electricity accounting and billing shall be owned by STU. Cost of meter to be borne by the intra-state users.
- (c) All interface meters installed at the points of inter connection between the two licensees excluding those covered under sub-clauses (a) and (b) above for the purpose of electricity accounting and billing shall be owned by respective licensee of each end. Cost of meter to be born by individual licensee.

- (d) All interface meters installed at the points of inter connection for the purpose of electricity accounting and billing not covered under sub-clauses (a), (b) and (c) such as in premises of open access customers shall be owned by supplier of electricity i.e. licensee) cost of which will be born by open access customers.
- (e) For the EHV consumers those are directly connected to transmission system the metering at consumer premises, energy accounting and billing shall be as per provision in Chhattisgarh State Electricity supply code.

8.4.2 Generating plants:

All generating plants including non conventional sources based Power Generating plants, connected to intrastate transmission system directly or through the system other than system of STU, may have energy meter installed at each generator terminal, HV side of generator step-up transformer (Standby Meter), HV side of unit auxiliary transformer (UAT), HV side of Station Transformers (ST).

8.4.3 Metering between State transmission utility-distribution licensee:

For measurement of power delivered by State transmission utility to distribution licensee (excluding station transformer consumption), metering shall be provided on the LV side of EHV Power Transformer i.e. 33kV side of 132/33kV and 11kV side of 132/11kV transformers installed in EHV sub-stations.

In case of multiple distribution licensees energy accounting meters shall be provided on all outgoing 33kV and 11kV feeders and reconciliation of energy shall be made by audit meter installed on LV side of power transformer at EHV sub-station.

8.4.4 Sub-station Auxiliary Consumption Metering:

The State transmission utility sub-stations auxiliary consumption shall be recorded on LV side of station auxiliary transformers. If such transformer(s) is feeding other local load (colony quarters, street lights etc.) apart from sub-station auxiliary load, separate metering shall be provided on individual feeders.

8.4.5 Operational Metering:

Operational metering shall be installed wherever reasonably required by State transmission utility /generating companies for applications other than tariff metering. The parameters and other requirements shall be finalized by State transmission utility based on the operational requirements.

8.5 Operation and Maintenance of the Metering System

The operation and maintenance of the meter and metering system shall be the exclusive responsibility of owner which includes proper installation, regular maintenance of the metering system, checking of errors of the CTs, VTs and meters, proper laying of cables and protection thereof, cleaning of connections/joints, checking of voltage drop in the CT/ VT leads, condition of meter box and enclosure, condition of seals, regular/daily reading meters and regular data retrieved through common meter reading instrument (CMRI) and data processing system (DPS), attending any breakdown/fault on the metering system etc.

8.6 Minimum technical requirements for energy meter

8.6.1 Measuring Elements: The meter shall be 3 phase 4 wire, full four quadrant type static Tri-vector Meter (TVM), which can be used for 3 phase 3 wire system or 2 phase 2 wire system (traction application) without affecting the metering accuracy and other essential parameters.

8.6.2 In case of import and export power requirement of different degree by the captive power generators/ consumers through the same connectivity /line, proper metering should be assured by licensee in such case keeping adequacy and adequate accuracy class of metering system.

8.6.3 The ABT meter shall have facility to correct the ratio error and phase angle error of external CTs and VTs connected to it.

8.6.4 Meter should measure fundamental RMS value of electricity and harmonics.

8.6.5 Operating System Parameters (for balanced and unbalanced load):

- (a) **Operating Voltage Range:** The meter shall work satisfactorily on 110 Volts AC (Line-Line) with variation range of -20% to + 15%.
- (b) **Operating Frequency Range:** The meter shall work satisfactorily on 50 Hertz with variation range of -5% to +5%.
- (c) **Operating Power Factor Range:** The meter shall work satisfactorily over a power factor range of zero lag to unity to zero lead.

8.6.6 Rated Nominal Current and Rated Maximum Current: Meter shall operate on 1 Ampere or 5 Ampere from CT secondary circuit. Rated maximum secondary current shall not exceed 120% of nominal current.

8.6.7 Rated Short time Current: Meter shall be capable of withstanding 20 times the rated nominal current for 0.5 second.

8.6.8 Minimum Starting Current: The meter shall start operating and recording energy with minimum starting current equal to 0.1 % of nominal current at unity power factor.

8.6.9 Burden and Power Consumption: The burden imposed by the metering system shall not exceed 1 W, 8 VA for voltage circuit and 1 VA for current circuit so that there is no significant voltage drop in the VT and CT leads.

8.6.10 Accuracy Class

Meter shall meet the following requirement of accuracy class . (Better than the mentioned accuracy class shall be acceptable):

Interface meters	0.2S	
Consumer Meter	11 kV and 33 kV	0.5S or better
	Above 33 kV	0.2S or better
Energy Accounting and audit meter	(1) In generating station, the accuracy class of meters at a point after the generator stator terminals and before the tap of to the unit auxiliary transformer(s) shall not be inferior to that of 0.2S accuracy class. However, the accuracy class of other meters shall not be inferior to that of 1.0S accuracy class. (2) The accuracy class of meters in transmission system shall not be inferior to that of 0.2S accuracy class. (3) The accuracy class of meters in distribution system shall not be inferior to that of 0.5S accuracy.	

[Reference CEA (Installation and Operation of Meter) Regulations, 2006 as amended from time to time.]

8.6.11 Earthing System: The metering system shall be suitable for solidly earthed power system.

8.6.12 Meter Box: The meter box shall conform to the degree of protection not less than IP-51 as stipulated in IS 12063, and shall be capable of satisfactory operation in an indoor, non-air conditioned installation.

8.6.13 Installation and mounting:

The meter shall be suitable for install indoor or outdoor application. In case CTs and VTs form part of the meters, the meter shall be installed as near the instrument transformers as possible to reduce the potential drop in the secondary leads.

The meter can be mounted in dust proof, lockable and tamper proof panel or rack or metal box, as per requirement and site condition, conforming to minimum IP-31 standards.

The metering system shall have facility of CT shorting when the meter module is withdrawn or dismantled.

8.6.14 Data Display Capabilities - Instantaneous Values:

The meter shall be capable to record and display (on demand) at least the following instantaneous parameters/information:

- (a) Three rms line voltages
- (b) Three rms line currents
- (c) System frequency (Hz)
- (d) Power factor with sign of lag/lead.
- (e) Watt - Import
- (f) Watt - Export
- (g) VAr - Lead
- (h) VAr - Lag
- (i) VA - Import
- (j) VA - Export
- (k) Maximum Demand (Import) during the month in Watt and VA with date and time
- (l) Maximum Demand (Export) during the month in Watt and VA with date and time
- (m) Meter Serial Number

8.6.15 Data Storage Capabilities - Cumulative Values:

The meter shall be capable to record, store and display (on demand) at least following cumulative parameters. At least five (5) registers shall be provided for each parameter, out of which one (1) register shall record energy for 24 hours in a day whereas other four (4) registers shall record Time of Day (TOD) energy during morning peak, morning offpeak, evening peak and evening off-peak durations:

- (a) Watt hour - Import
- (b) Watt hour - Export
- (c) VAr hour - Lead while Watt hour - Import
- (d) VAr hour - Lag while Watt hour - Import
- (e) VAr hour - Lead while Watt hour - Export
- (f) VAr hour - Lag while Watt hour - Export
- (g) VA hour - Import
- (h) VA hour - Export
- (i) VAr hour during low voltage ($V < 97\%$)*
- (j) VAr hour during high voltage ($V > 103\%$)*

**These parameters are for Availability Based Tariff (ABT) purpose only hence TOD registers are not required*

8.6.16 Data Logging Capabilities 1 - Integrated Values:

The meter shall have sufficient memory to store any combination of at least ten (10) parameters listed in Clause 8.6.14 and Clause 8.6.15 over minimum forty (40) days at a logging interval of fifteen (15) minutes. The State transmission utility shall be able to select these parameters locally through optical port using CMRI and/or remotely through communication port. At least, following essential parameters shall be logged at an interval of 15 minutes:

- (a) Watt - Import
- (b) Watt - Export

- (c) VAr - Lead while Watt - Import
- (d) VAr - Lag while Watt - Import
- (e) VAr - Lead while Watt - Export
- (f) VAr - Lag while Watt - Export
- (g) VAr hour during low voltage ($V < 97\%$)
- (h) VAr hour during high voltage ($V > 103\%$)
- (i) Average frequency (Hz)
- (j) Average three phase voltage

In case of operational metering, the number of parameters and their logging intervals shall be decided by the Licensee as per their operational requirements.

8.6.17 Other Parameters:

Each meter shall also store the values of active energy (Import), active energy (Export), reactive energy (lag) and reactive energy (lead) separately during active energy (import) & active energy (export) conditions recorded at 24.00 hours on last day of the month for a period of at least twelve (12) months in any case. Intra-state user shall be able to program time and day at which value of energy to be stored in the memory.

8.6.18 Events and Abnormalities Logging Capabilities:

The meter shall be able to log date and time stamped events captured with a resolution of at least one (1) second. Sufficient memory shall be provided to store at least last 100 events in the meter on First-In-First-Out (FIFO) basis with compartment wise as following, but not limited to:

- (a) Missing potential (VT supply missing)
- (b) CT/VT Polarity reversal
- (c) Current unbalances (magnitude as well as phase unbalance) in any one of the phases or more than one phase
- (d) Voltage unbalances (magnitude as well as phase unbalance) in any one of the phases or more than one phase
- (e) Supply interruptions along with the duration of each interruption
- (f) Tamper information/anomaly occurrence/anomaly restoration.
- (g) Meter internal set-up/program change information

8.6.19 Real Time Clock (RTC) and Calendar:

The meter shall have in-built Quartz crystal based accurate Real Time Clock. The meter shall display real time in 24 hours format (hh: mm: ss).

Meter shall also display the date as per Indian calendar in dd-mm-yyyy format. Thirty (30) years calendar with automatic leap year adjustment shall be provided in the meter.

The accuracy of the clock and calendar shall not be more than 1 (one) minute per year or better than 1 (one) minute per year.

8.6.20 Time synchronization:

All meters shall have facility for time synchronisation locally and/or remotely through a Global Positioning System (GPS) or through the central computer (at CDCC) using the same port used for remote data communication.

8.6.21 Data retention:

The logged data shall be stored in a non-volatile memory of meter with a minimum retention period of ten (10) years without any battery back-up.

8.6.22 Data concentration and network integration:

The local network of all meters installed in a sub-station shall be formed using modem/multiplexer/data concentrator/LAN hub switch. This local network shall be integrated with communication network using appropriate standard protocol.

Communication network may be based on Radio frequency, Microwave, Public Switched Telephone Network (PSTN), Power Line Carrier Communication (PLCC), Very Small Aperture Terminal (VSAT) network, Optical Fibre Cable (OFC), GSM, Low Power Radio Frequency or any other means of telemetry.

8.6.23 Pulse Output:

High intensity light emitting diodes (LED) shall be provided on front of the meter for test calibration and accuracy check of Wh and VARh measurements.

8.6.24 Display:

Meter shall have a minimum of 7 digits Alpha-numeric liquid crystal display (LCD) or light emitting diode (LED) type display with bright back-light and automatic back-light time out feature. A touch key pad or push buttons shall be provided on the meter front for switching ON the display and for changing from one indication to next. Two separate push buttons shall be provided one for scrolling and other for MD resetting.

8.6.25 Data Security:

- (a) Data encryption (coding) capability
- (b) Mechanical seals and locks i.e. sealing provision for terminal block, meter cover, MD reset predefined date and time or CMRI and all communication ports.
- (c) Message authentication algorithm capability/Multi-level password protection
- (d) Independent security across communication channels

8.6.26 Self-Diagnostics feature:

The meter shall have self diagnostics feature to scan the healthiness of internal components and circuitry. On detection of any exception or fault, meter shall display the message immediately.

8.6.27 Communication Ports:

The meter shall have at least following communication ports:

- (a) One optically isolated infra-red communication port (optical port) for local communication as per IEC 1107
- (b) One galvanically isolated Ethernet (LAN) port or RS485 serial port or RS232 serial port for remote communication

8.6.28 Communication Protocol:

For communication by meter with external devices, meter supplier shall implement industry standard open protocol(s) like MODBUS RTU, MODBUS, TCP/IP, IEC 870-5-102, IEEE 1377, DNP 3.0, Device Language Message Specification (DLMS) or any other industry standard protocol.

In case of proprietary protocol, the meter supplier shall furnish the protocol software and details of protocol followed by him. Any variation in the standard protocol for optimizing communication resources shall be detailed.

8.6.29 Reprogramming of the meter:

Utility shall be able to select the display parameters, logging parameters, timings of TOD registers, billing dates, logging interval or any other parameter locally using CMRI through optical and/or remotely using meter reprogramming software installed at CDCC through communication port(s).

8.6.30 Data Downloading:

Utility shall be able to download the logged data locally using CMRI through optical port and/or remotely using meter interrogation software installed at CDCC through communication port(s). Any interrogation/read operation shall not delete or alter any stored meter data.

8.6.31 External auxiliary supply:

The metering system shall derive operating system from AC or DC auxiliary supply. For auxiliary supply the internal DC battery which is an integral part of the meter or capacitor devices, incorporated in the meter, should be used.

8.7 Minimum technical requirement for instrument transformer :

8.7.1 Single-phase type current transformers shall be used for 3 phase 4 wire and 3 phase 3 wire or 2 phase 2 wire (traction application) measurement system. The secondary current rating of the current transformer (CT) shall be 1 ampere or 5 ampere

depending upon the total circuit burden. 5A secondary can be used for low burden circuits.

8.7.2 Either dedicated set of CT / VT or dedicated core of current transformers shall be provided for metering and wherever feasible, CTs (or their cores) feeding to main meters and check meters shall be separate. The errors of the CT / VT shall be checked in the laboratory or at site. The CT / VT shall be tested using the testing equipment calibrated by any NABL lab or any NABL accredited laboratory." The main meter and check meter shall be connected to same core of CTs and VTs.

8.7.3 The total burden connected to each current transformer shall not exceed the rated burden of CT/VT. Total circuit burden shall be kept close to rated burden of CT for minimum error and percentage voltage drop in VT leads shall be within the permissible limits.

8.7.4 Either Electromagnetic Voltage Transformers (EVT) or Capacitive Voltage transformer (CVT) may be used for metering purpose. Generally, voltage transformers (VT) is used to cover either EVT or CVT. The secondary voltage per phase shall be $110/\sqrt{3}$ volts. For protection of VT suitable devices such as MCB's etc may be used.

8.7.5 The minimum acceptable detailed specification for instrumentation transformer are as follows.

A) Minimum acceptable specifications of dedicated single-phase EHV & HV current transformers (CT) for metering

S.No.	Particulars	11KV	33KV	132KV	
1	Nominal System Voltage (Kv rms)	11	33	132	
2	Highest System Voltage (kV rms)	12	36	145	
3	Reference Standard	IS 2705 with latest amendments			
4	Standard CT Ratio	2000 or 1000/1-1	800 or 400/1-1	800 or 400/1-1-1	1200 or 600/1-1-1-1
		1600 or 800/1-1	600 or 300/1-1	400 or 200/1-1-1	800 or 400/1-1-1-1
		1200 or 600/1-1	400 or 200/1-1	200 or 100/1-1-1	
		800 or 400/1-1	300 or 150/1-1	100 or 50/1-1-1	
		600 or 300/1-1	100 or 50/1-1		
		400 or 200/1-1			
		300 or 150/1-1			
		150 or 75/1-1			
S.No.	Particulars	11KV	33KV	132KV	
5.	No. of Metering cores	Two			

6.	Rated Continuous Thermal Current	120% of Rated Primary Current			
7.	Rated Short time thermal primary current	13.1 KA for 1 sec	26.2 KA for 2 sec	31.5/40 KA for 1 sec	40 KA for 1 sec
8.:	CT characteristics				
(a)	Rated Primary Current (Amps)	2000 or 1000	800 or 400	400	800
		1600 or 800	600 or 300	200	
		1200 or 600	400 or 200	100	
		800 or 400	300 or 150	50	
		600 or 300	100 or 50		
		400 or 200			
		300 or 150			
		150 or 75			
(b)	Rated Secondary Current (Amps)	1 or 5	1 or 5	1 or 5	1 or 5
(c)	Accuracy Class	0.5S	0.5S	0.2S	0.2S
(d)	Maximum Instrument Security Factor (ISF)	5	5	5	5
(e)	Rated Secondary Burden (VA)	30	30	15	15
9.	Reference Standard for insulating oil	IS 335 with latest amendments			

B) Minimum acceptable specifications of dedicated metering

S.No.	Particulars	33kV
Specification of CT (for CT-PT Set)		
1	Nominal System Voltage (kV rms)	33
2	Highest System Voltage (kV rms)	36
3	Reference Standard	IS 3156 with latest amendments
4	Standard CT Ratio (Amps/Amps)	200 or 100/1-1 100 or 50/1-1
5	Rated continuous thermal current	120% of rated primary current
6	Rated short time thermal primary current for 1 second (in kA)	25
7	CT Characteristic:	
a	Rated Primary Current (Amps)	200 or 100 100 or 50
b	Rated Secondary Current (Amps)	1 or 5
c	Accuracy Class	0.5S
d	Maximum Instrument Security Factor (ISF)	<10
e	Rated Secondary Burden (VA)	30
8.	Reference Standard for insulating oil	IS 335 with latest amendments
Specification of PT (for CT-PT Set)		
1	Nominal System Voltage (kV rms)	33
2	Highest System Voltage (kV rms)	36

3	Reference Standard	IS 3156 with latest amendments
a	No. of Secondary Windings for potential measurement devices	Two
b	Standard Voltage Ratio	33kV/ $\sqrt{3}$ / 110V/ $\sqrt{3}$
c	Rated Secondary Burden (VA) per winding	50
d	Accuracy Class (At 10% to 100% of rated VA burden)	0.5S
e	Rated Voltage Factor and Duration	1.2 continuous and 1.5 for 30 seconds

C) Minimum acceptable specifications of dedicated single-phase EHV capacitor voltage transformers (CVT) for metering

Sr. No.	Particulars	132kV	220kV
1	Nominal System Voltage (kV rms)	132	220
2	Highest System Voltage (kV rms)	145	245
3	Reference Standard	IS 3156 with latest amendments	
4	Rated Capacitance (pF)	4400 pF with tolerance +10% and -5%	
5	For low voltage terminal over entire carrier frequency		
	(a) Stray Capacitance	Shall not exceed 200 pF	
	(b) Stray Conductance	Shall not exceed 20 micro siemens	
6	(a) High frequency capacitance for entire carrier frequency range	Within 80% to 150% of rated capacitance	
	(b) Equivalent Series Resistance over the entire frequency range	Less than 40 ohms	
7	No. of Secondary Windings for potential measurement devices	Three	Three
8	Standard Voltage Ratio		
	(a) Winding-I, II, III	132kV/ 3 110V/ 3	220kV/ $\sqrt{3}$ / 110V/ $\sqrt{3}$
9	Rated Secondary Burden (VA)		
	(a) Winding-I	-----	-----
	(b) Winding-II & III	50	50
10	Accuracy Class		
	(a) Winding-I	3P	
	(b) Winding-II	0.2	
	(c) Winding-III	0.2	
11	Rated Voltage Factor and Duration		
	(a) Winding-I	1.2 continuous and 1.5 for 30 seconds	
	(b) Winding-II	1.2 continuous and 1.5 for 30 seconds	
12	Reference Standard for insulating oil	IS 335 with latest amendments	

NOTE: Electromagnetic VTs may be used up to 220KV class.

D) Minimum acceptable specifications of dedicated single-phase EHV potential transformers (PT) for metering

S. No.	Particulars	132kV	220kV
1	Nominal System Voltage (kV rms)	132	220
2	Highest System Voltage (kV rms)	145	245

3	Reference Standard	IS 3156 with latest amendments	
4	No. of Secondary Windings for potential measurement devices	Three	Three
5	Standard Voltage Ratio		
	(a) Winding-I,II, III	132kV/ $\sqrt{3}$ / 110V/ $\sqrt{3}$	220kV/ 3 / 110V/ 3
6	Rated Secondary Burden (VA)		
	(a)Winding-I	----	----
	(b) Winding-II & III	50 or 100	50 or 100
7	Accuracy Class		
	(a) Winding-I	3 P	
	(b) Winding-II	0.2	
	(c) Winding-III	0.2	
8	Rated Voltage Factor and Duration		
	(a) Winding-I	1.2 continuous and 1.5 for 30 seconds	
	(b) Winding-II	1.2 continuous and 1.5 for 30 seconds	
9	Reference Standard for insulating oil	IS 335 with latest amendments	

E) Minimum acceptable specifications of dedicated single-phase HV potential transformers (PT) for metering

S. No.	Particulars	33kV	11kV
1	Nominal System Voltage (kV rms)	33	11
2	Highest System Voltage (kV rms)	36	12
3	Reference Standard	IS 3156 with latest amendments	
4	No. of Secondary Windings for potential measurement devices	Three	Three
5	Standard Voltage Ratio	33kV/ 3 / 110V/ 3	11kV/ 3 / 110V/ 3
6	Rated Secondary Burden (VA) per winding		
	(a)Winding-I	-----	-----
	(b) Winding-II	50	50
	(c) Winding-III	50	50
7	Accuracy Class(At 10% to 100% of rated VA burden)	0.2	0.2
	(a) Winding-I	3 P	
	(b) Winding-II	0.5	
	(c) Winding-III	0.5	
8	Rated Voltage Factor and Duration	1.2 continuous and 1.5 for 30 seconds	

8.8 Testing Arrangements

8.8.1 At the time of commissioning, each interface meter shall be tested by the owner at site for accuracy using standard reference meter of better accuracy class than the meter under test. The test terminal blocks shall be provided on all meters to facilitate testing of meters. Portable test set with high accuracy static source and 5 times more accurate (or better) electronic reference standard meter shall be used for testing. This means at least class 0.1S reference standard meter for testing of class 0.2S meter, class 0.1S reference standard meter for testing of class 0.5S meter

and class 0.2S reference meters for testing of class 1.0S meter. These benches shall also be used for checking and calibration of portable testing equipments. The above shall be applicable for laboratory testing of meters, however, for site testing meter testing equipments with one class higher accuracy than meter under test may be used as per provision of IS-12346-1999.

- 8.8.2 Separate test terminal blocks for testing of main and check meters shall be provided so that when one meter is under testing, the other meter continues to record actual energy during testing period. Where only one/main meter exists, an additional meter shall be put in circuit during the testing period of the main meter so that while the main meter is under testing, the other meter can record energy during the period of meter under testing.

8.9 System for joint inspection, testing, calibration of interface meter

- 8.9.1 The metering system located at metering points between generating plants, State transmission utility and distribution licensees shall be regularly inspected, tested and calibrated once in a year but at least once in five year (or at an interval lesser than one year as mutually agreed) jointly by both the agencies involved for dispatch and receipt of energy. Since the static trivector meters are calibrated through software at the manufacturers' works, only accuracy of the meters and functioning shall be verified during joint inspection. In case of any doubt or defect, the meter shall be replaced then and there or calibrated. In later case, error correction as determined will be applied to the meter reading for the purpose of billing. To cover for loss of time, spare meters shall always be kept available with the agency to whom the meter/metering point belongs. After testing, the meter shall be properly sealed and a joint report shall be prepared giving details of testing work carried out, details of old seals removed and new seals affixed, test results, further action to be taken (if any) etc.

- 8.9.2 Joint inspection shall also be carried out as and when difference in meter readings (so corrected) exceeds the permissible error as per accuracy class of main and check meter. The meters shall be jointly tested/ calibrated on all loads and power factors as per relevant standards through static phantom load.

8.10 Meter Sealing Provision

- 8.10.1 Polycarbonate or acrylic seals or plastic seals or holographic seals or any other superior seal shall be used.
- 8.10.2 Lead seals shall not be used in the new meters. Old lead seals shall be replaced by new seals in a phased manner and the time frame of the same shall be submitted by the licensee to the Appropriate Commission for approval.
- 8.10.3 Metering systems shall be jointly sealed by the authorized representatives of the concerned parties. The sealing of meter shall be arranged as per the provisions in CEA (Installation and Operation of Meters) Regulation 2006.
- 8.10.4 No seal, applied pursuant to this metering code, shall be broken or removed except in the presence of or with the prior consent of the agency affixing the seal or on whose behalf the seal has been affixed unless it is necessary to do so in circumstances where (i) there occurs a fire or similar hazard and such removal is essential and such consent cannot be obtained immediately (ii) such action is required for the purpose of attending to the meter failure. In such circumstances, verbal consent shall be given immediately and it must be confirmed in writing forthwith.

8.11 Procedure for Assessment of Consumption In Case of Defective and/or Stuck-Up Meter

- 8.11.1 (a) Whenever difference between the readings of the Main meter and the Check meter for any month is more than 0.5%, the following steps shall be taken:

- (i) checking of CT and VT connections;
- (ii) testing of accuracy of interface meter at site with reference standard meter of accuracy class higher than the meter under test.

If the difference exists even after such checking or testing, then the defective meter shall be replaced with a correct meter.

- (b) In case of conspicuous failures like burning of meter and erratic display of metered parameters and when the error found in testing of meter is beyond the permissible limit of error provided in the relevant standard, the meter shall be immediately replaced with a correct meter.
 - (c) In case where both the Main meter and Check meter fail, at least one of the meters shall be immediately replaced by a correct meter.
- 8.11.2 When main meter is found to be defective or has stopped, reading of the check meter shall be considered for billing purpose subject to condition that the check meter has been found working properly.
- 8.11.3 In case of outage of both the main and check meters, if any energy is interchanged in the intervening period the assessment has to be done on the basis of reading recorded in generator's sending end meter (standby meter) if found working properly by considering average of previous 3 months percentage line loss when both interface meter and generators meter were found working properly.
- 8.11.4 In case of outage of both the main meters and check meters so also generator's sending end meters (Standby), the energy injected into the State grid may be assessed on the basis of average of previous three months energy loss calculated of the respective sub-station of licensee when main/check meters were working properly.
- Readings recorded by Main, Check and Standby meters for every time slot shall be analysed, crosschecked and validated by the State Load Despatch Centre (SLDC). The discrepancies, if any, noticed in the readings shall be informed by the SLDC in writing to the energy accounting agency for proper accounting of energy. SLDC shall also intimate the discrepancies to the State Transmission Utility or the licensee, who shall take further necessary action regarding testing, calibration or replacement of the faulty meters in accordance with the provisions laid down.
- 8.11.5 In case the meter installed in premises of bulk consumer who is availing open access or supplied directly from transmission network becomes defective the assessment of energy drawal is to be done as per provisions specified for the consumer in C.G.State Electricity Supply Code as amended to time to time.
- 8.11.6 The STU shall install special energy meters on all inter connections between the regional entities and other identified points for recording of actual net MWh interchanges and MVarh drawals. The installation, operation and maintenance of special energy meters shall be in accordance with Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006. All concerned entities (in whose premises the special energy meters are installed) shall take weekly meter readings and transmit them to the SLDC by Monday noon. The SLDC must ensure that the meter data from all installations within their control area are transmitted to the RLDC as per the schedule.

8.12 Replacement of defective or stuck-up meter

A defective or stuck-up meter shall be replaced within 15 (fifteen) days. The owner of the meter shall maintain spare inventory of meters, so that down time is minimized.

8.13 Mechanism for dispute resolution

Any disputes relating to inter-utility metering between State transmission utility and any generating company/distribution licensees/intra-state users shall be settled in accordance with procedures given under relevant power purchase agreements (PPA)/connection agreement or relevant agreement, as the case may be. In case of unresolved dispute, the matter may be referred to the Commission.

- 8.14. To keep pace with continuous and fast up-gradation in the technology of metering and communication, the metering code needs to be reviewed periodically as per CEA Regulations/guidelines and the Commission may issue directives from time to time.

CHAPTER - 9

CONTINGENCY PLANNING

9.1 General Principles

9.1.1 To define the responsibilities of all the intra-state users for achieving the fastest possible recovery of the grid in the event of a failure in the transmission system, or any sudden loss of Generation or a blackout caused due to the failure of the Western Grid. All hydro stations should compulsorily have Black start facilities and all EHV substation at 220 kV and above should have synchronizing facilities to meet the contingency. During the blackout procedure to be adopted for fast recovery shall take into account the following:

- i. The possible transfer of power from the neighboring System through Inter State transmission lines,
- ii. The extent of immediate availability of power from the Central Sector generating stations and the generating plants.
- iii. Availability of power from any embedded generator connected to state grid.

9.1.2 The main objective is to achieve the following:

- i. The essential loads required to be restored immediately.
- ii. Restoration of the total system and associated demand in the shortest possible time.
- iii. Resynchronization of parts of the system which have ceased to be in synchronism,
- iv. To ensure that the communication arrangements for use in circumstances of serious disruption to the System are available to enable senior management representatives of the SLDC, the transmission licensee and the intra-state users who are authorized to take decisions on behalf of the transmission licensee or the intra-state user.
- v. To ensure that the transmission system can operate in the event of the SLDC is incapacitated for any reason.
- vi. The situation prevailing prior to the occurrence of the contingency, e.g. availability of specific generating stations, transmission lines, and load demands will largely determine the restoration procedure to be adopted in the event of a total blackout.
- vii. The SLDC shall co-ordinate with WRLDC and STU in determining the extent of problems. The SLDC shall inform maximum intra-state users of the situation and advice them to follow the strategy as outlined in this section for restoration.
- viii. The use of communication channels shall be restricted to the operational communications only, till normalcy is restored.

9.2 Total Regional Blackout:

In case of Total Regional Blackout, the recovery shall be as per the Black Start procedure prepared by WRLDC in consultation with all the constituents of western region. As these procedures are updated periodically, the last updated procedures shall be followed during the total regional blackout.

9.3 Partial state transmission system blackout:

In case of partial State transmission system blackout, the recovery shall be as per the Black Start/Restoration procedure prepared by SLDC in consultation with the intra-state users. As these procedures are updated periodically, the last updated procedures shall be followed during the partial state transmission system blackout. The instruction issued by SLDC in restoration of system from partial black out shall be followed by the intra-state users even though the same is not specifically mentioned in Black Start procedure/restoration document.

9.4 Responsibilities:

9.4.1 The SLDC shall maintain a record of Generating plants with black start capabilities and Black Start operation plans.

- 9.4.2 The SLDC shall prepare, distribute, and maintain up-to-date 'black start' procedures covering the restoration of the transmission system following total or partial blackouts. The intra-state users shall agree to these 'black start' procedures and inform promptly to the SLDC whenever they have difficulty.
- 9.4.3 The SLDC shall be responsible for directing the overall transmission system restoration process by co-ordination with all the intra-state users and in close co-ordination with the WRLDC.
- 9.4.4 The distribution licensees shall be responsible for sectionalizing the distribution system into discrete, unconnected blocks of load. They shall advise the SLDC as to the quantum of load likely to be picked up by the plants being synchronized.
- 9.4.5 The generating plants shall be responsible for commencing their planned 'black start' procedure on the instruction of the SLDC and steadily increasing their generation according to the demand intimated by the SLDC.

9.5 Special consideration:-

- 9.5.1 During the process of restoration of the transmission system, or regional system blackout conditions, the normal standards of voltage and frequency need not be applied, and left to the discretion of the SLDC as it considers appropriate depending on the prevailing situation.
- 9.5.2 The distribution licensee shall separately identify non-essential components of essential loads, which may be kept off during system contingencies. They shall also draw up an appropriate schedule with corresponding load blocks in each case. The non-essential loads can be put on only when the system normalcy is restored, and as advised by the SLDC.
- 9.5.3 All intra-state users shall pay special attention in carrying out the procedures to prevent secondary collapse of the system due to haste or inappropriate loading.
- 9.5.4 Despite the urgency of the situation, careful, prompt and complete logging of all operations and operational messages shall be ensured by all the intra-state users to facilitate subsequent investigation into the incident and the efficiency of the restoration process. Such investigation shall be conducted promptly after the incident, and SLDC shall place before the State Grid Coordination Committee for appraisal in its next immediate meeting.

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CHAPTER - 10 SAFETY STANDARDS

10.1 SAFETY STANDARDS:

10.1.1 The "Safety Standards" formulates the precautions to be taken for ensuring safety for the general public, consumers of electricity and the workmen. This forms an integral part of this Code and STU/transmission licensee and all the intra-state users shall comply with those Standards notified by CEA like CEA (Safety Requirements for Construction, Operation and Maintenance of Electric Plants and Electric Lines), Regulation, 2011, CEA (Measures relating to Safety and Electric Supply), Regulation, 2010.

10.1.2 (i) STU/transmission licensee shall prepare its own "Safety manual" for the transmission lines; Substations based on this standard. For the guidance of the Shift Operators, "Operation and Maintenance Manuals" for each Sub-station shall be prepared by the licensee. These manuals shall contain all the maintenance and operation schedules based on the recommendations of the manufacturers of the various equipments installed in the Sub-station. These manuals shall be periodically reviewed based on the experience gained and replacement of equipments. A maintenance register for the equipments including the station batteries shall be maintained at the respective Sub-stations. These shall be updated as and when the maintenance work is carried out and shall be periodically reviewed by the appropriate higher authority in whose control the sub-station falls. Similar registers shall be maintained for the transmission lines.

(ii) State transmission utility/Transmission Licensee shall appoint / designate suitable qualified person as designated Electrical Safety Officer for coordination of safety procedure / measure for

ensuring observance of safety measures and function as specified in CEA (Safety Requirements for Construction, Operation and Maintenance of Electric Plants and Electric Lines), Regulation, 2011 and CEA (Measures relating to Safety and Electric Supply) Regulations, 2010.

10.1.3 The operation manual shall clearly contain the details of isolation and earthing to be provided for allowing work on the equipments. The single line Diagram of the Sub-station indicating the positions of various isolating devices shall be prominently displayed in the sub-station. Charts showing the clearances from live parts (section clearance) for working on the isolated equipments where workmen are allowed to work shall be displayed prominently at each sub-station.

10.1.4 The danger boards / danger notice as required in CEA (Measures relating to Safety and Electric Supply), Regulation, 2010 and relevant Indian Standard shall be displayed at places approachable by the general public.

10.1.5 Regular maintenance shall be carried out on all the transmission lines in accordance with IS:5613 and records shall be maintained. Wherever possible hot line checking and replacement of failed insulators and maintenance work shall be done before and after monsoon. The hot line techniques for maintenance of critical transmission lines and sub-stations shall be adopted wherever possible. Only trained staff shall be used for the hot line techniques and the tools employed in such techniques shall have necessary certification from a national or international accredited laboratory before usage.

10.1.6 All the equipments in the receiving stations and sub-stations shall be maintained in good condition as per the manufacturer's manuals and relevant Indian and/or International standards, wherever available. The relays and circuit breakers shall be checked, tested for their proper operation whenever these are taken out for maintenance purposes. The station batteries shall be maintained in good working condition by carrying out routine checks and maintenance works. The DC system provided in all these stations shall be properly maintained to ensure that leakage current is meagre. An on-line monitoring system for monitoring of leakage and detection of ground faults shall be provided. The diagnostic methods of maintenance shall be preferred over traditional time based maintenance. Thermo-vision scanning for hot spots on all overhead lines and sub-station equipment at voltage level of 220 kV and above shall be carried out at least once a year and necessary remedial measures shall be taken where hot spots are detected. The residual life assessment shall be carried out for all major equipments including transformers, reactors, breakers, as envisaged by the relevant standards. The use of diagnostic technique for condition based monitoring of equipments should be adopted as per Regulation 25 of CEA (Grid Standards) Regulation, 2010. Records of all maintenance is carried out for each equipment and shall be kept in the table and formats in electronic form and hard copy and the next due date for maintenance of each item of work shall be clearly marked in such tables and formats.

10.2 Line Clear Permit (LCP):

The format under **Annexure "C" and "D"** shall be used to request for permit to work on electrical line or equipment and to return the permit when the work on electrical line or equipment is over.

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Chapter - 11

OPERATIONAL EVENT AND INCIDENT REPORTING

11.1 Reportable Incidents:

11.1.1 All events in the transmission system shall be notified by STU/transmission licensee to SLDC and the intra-state users, whose systems are affected.

11.1.2 All events on the intra-state user's system having an operational effect on the transmission system shall be notified by the intra-state user to STU/transmission licensee and SLDC who in turn shall notify the other intra-state users on whose system the event may have an operational effect. The intra-state user shall submit incident report covering the points shown in clause 11.2.2 of this code.

11.1.3 Typical examples of reportable incidents that could affect the transmission system are as follows:

- (a) Exceptionally high/low voltage or frequency,
- (b) Serious equipment problem i.e. major circuit breaker, transformer, bus bar fault, (c) Major problem in the generating unit,
- (d) Tripping of ICT, transmission line or capacitor bank, reactor.
- (e) Major fire incident, cyclones, storms earthquakes etc.,
- (f) Major protection failure,
- (g) Over loading of equipment or transmission line which may result in hazard to the personnel,
- (h) Activation of any alarm or indication of abnormal operating condition, (i) Adverse climatic conditions being experienced or forecast,
- (j) Breakdown, or faults, or temporary changes in the capabilities of Plant and/or apparatus,
- (k) Impending risks of protection operation,
- (l) Loss of load,
- (m) Accidents,
- (n) Excessive drawal deviations,
- (o) Minor equipment alarms.

Note:

(i) The last two reportable incidents are typical examples of those of lesser consequences, but still affect the transmission system and can be reasonably classified as minor.

(ii) The examples indicated in the above are only illustrative and in no way limit the general requirements to be reported.

11.2 Reporting procedure:

11.2.1 All reportable incidents occurring in lines and equipments of 33kV and above at the grid sub-stations shall promptly be reported orally by the intra-state user whose equipment has experienced the incident to all other significantly affected intra-state users and SLDC. The reporting intra-state user should submit a written confirmation to SLDC within one hour of such oral report. If the reporting incident is of major nature, the written report may be submitted within two hours duly followed by a comprehensive report within 48 hours of the submission of the initial written report. In other cases, the reporting intra-state user shall submit a report within five working days to SLDC.

11.2.2 The SLDC shall call for a report from any intra-state user on any reportable incident affecting other intra-state users, in case such intra-state user, whose equipment might have been a source of the reportable incident, does not report the same. However, this shall not relieve any intra-state user from the obligation to report events in accordance with CEA (Measures relating to Safety and Electric Supply) Regulations, 2010 as amended from time to time. The format for such a report shall be as per the approval of the Grid Coordination Committee and typically contain the following:

- (a) Location of the incident, (b) Date and time of the incident,
- (c) Plant or Equipment involved,
- (d) Supplies interrupted and the duration wherever applicable,
- (e) Amount of Generation lost, wherever applicable, (f) System Parameters before and after the incident, (Voltage, Frequency, Flows, Generation etc.),
- (g) Network configuration before the incident,
- (h) Relay indications and performance of protection,
- (i) Brief description of the incident,

- (j) Estimated time of return to service,
- (k) Any other relevant information,
- (l) Recommendations for future improvement, and
- (m) Name and designation of reporting officer.

11.2.3 The report shall contain sufficient details to describe the event to enable the recipient to assess the implications and risks arising out of the same. The cause need not be included in the report but the recipient may ask for clarifications wherever necessary and it is obligatory that the reporting intra-state user shall put his best efforts and provide all the necessary and reasonable information.

11.2.4 In case of a request by either party the oral report shall be written down by the sender and dictated by way of a telephone message or sent by fax/e-mail to the recipient. In case of an emergency the report can be given only orally and followed by written confirmation.

11.2.5 The maximum time limit allowed for oral report of the event is fifteen minutes from the time of the occurrence of the event.

11.2.6 SLDC will be responsible for reporting event in line with the procedure set in IEGC.

11.3 Significant events:

11.3.1 Significant event includes such events having an operational effect e.g.

- (a) Tripping of plant and/or apparatus manually or automatically (b) Voltage outside statutory limits
- (c) System frequency outside statutory limits
- (d) System instability or
- (e) System overloads.

11.3.2 Wherever a intra-state user reports an event, which the SLDC or STU/transmission licensee considers to have had a significant effect on the transmission system, STU/transmission licensee may require the intra-state user to report that event in writing within one day.

11.3.3 Wherever STU/transmission licensee notifies SLDC and a intra-state user of any event which the intra-state user or SLDC considers to have had a significant effect on the intra-state users' system, the intra-state user may require the transmission licensee to report that event in writing within one day.

11.4 Warnings:

11.4.1 An oral warning shall be issued by SLDC and confirmed in writing as well, to the STU/transmission licensee and the intra-state users, who may be affected when SLDC knows that there is a risk of widespread and serious disturbance to the whole, or part of, the total system.

11.4.2 Provided that sufficient time is available, the warning shall contain such information, as the SLDC considers reasonable, to explain the nature, and extent of the anticipated disturbance, to the Intra-state user and STU/transmission licensee, provided that such information is available to SLDC.

11.4.3 Each intra-state user and STU/transmission licensee, on receipt of such a warning, shall take necessary steps to warn its operational staff and maintain its Plant and apparatus in the condition in which it is best able to withstand the anticipated disturbance for the duration as confirmed / warned.

11.4.4 Scheduling and dispatch may be affected during the period covered by such a warning.

11.5 Loss of communication with the SLDC:

11.5.1 In the event of loss of communication with SLDC the provision made as above shall not apply but instead the following provision shall apply:

11.5.2 Each generating plants shall continue to operate in accordance with the last dispatch instruction issued by SLDC, but shall use all reasonable endeavors to maintain the system frequency between 49.5 Hz to 50.2 Hz as per IEGC, 2010 until such time the new dispatch instructions are received from SLDC.

11.6 Major failure:

Whenever a major failure takes place, STU/ transmission licensee and other intra-state users shall co-operate, inquire establish the cause of such failure and produce appropriate recommendations. STU shall submit the enquiry report to the Grid Coordination Committee.

11.7 Accident reporting:

11.7.1 If any accident occurs in connection with the generation, transmission, distribution, supply or use of electricity or in connection with any part of electric lines or electrical plant of any person and the accident results or is likely to have resulted in loss of human life or any injury to a human being the same shall be dealt accordance with CEA (Safety Requirements for Construction, Operation and Maintenance of Electrical Plants and Electric Lines) Regulations, 2008 as amended from time to time..

11.7.2 Reporting of accidents shall be done to concern authority as per prevailing rules.

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CHAPTER - 12

DATA REGISTRATION

12.1 Responsibility:

12.1.1 All the intra-state users are responsible for submitting the up-to-date data in accordance with the provisions of the Grid Code. All the intra-state users shall provide SLDC/STU, the names, addresses, and the telephone numbers of the persons responsible for sending the data. SLDC/STU shall inform all the intra-state users the names, addresses and telephone numbers of the persons responsible for receiving the data.

12.1.2 SLDC shall provide up-to-date data to intra-state users as provided in the relevant Chapters of the Grid Code.

12.1.3 Responsibility for the correctness of these data rests with the concerned intra-state users providing the data.

12.1.4 The data schedules are structured to serve as standard formats for data submission and these formats shall be used for written data submission. Wherever standard data formats are not given, these should be developed by SLDC/STU in consultation with the intra-state users.

12.1.5 Wherever a computer data link exists between the intra-state user and SLDC, data may be submitted through this link. The data shall be in the same format as specified for paper transmission except for electronic encoding for which some other format may be more appropriate. The intra-state user shall specify the method to be used in consultation with STU/SLDC and resolve issues such as protocols, transmission speeds etc., at the time of transmission.

12.2 Changes in intra-state user's data:

12.2.1 Whenever the intra-state user becomes aware of the change to any items of the data registered under license, the intra-state user must promptly notify the SLDC of the changes. SLDC on receipt of the changes shall promptly correct the database accordingly. This shall also apply to any data compiled by SLDC regarding his own system.

12.3 Data not supplied:

All the intra-state users are obliged to supply the data referred to in the individual Sections of the Grid Code and listed above. In case any data is missing and not supplied by the intra-state user, SLDC may act reasonably. If and when necessary, he may estimate such data depending upon the urgency of the situation. Similarly in case any data is missing and not supplied by SLDC, the concerned intra-state user may, act reasonably. If and when necessary, he may estimate such data depending upon the urgency of the situation. Such estimates, in each case, shall be based upon the corresponding data for similar plant or apparatus, or upon such other information, the intra-state user or SLDC, as the case may be deems appropriate.

12.4 Special considerations:

SLDC or any intra-state user may at any time make reasonable request for extra data as necessary.

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CHAPTER - 13

MISCELLANEOUS

13.1 Other Codes and Regulations

Intra-state user(s) shall ensure that new buildings, structures, additions, modifications and any other construction projects keep the minimum clearances required from existing supply lines of the licensee. These minimum clearances are specified in the CEA (Measures relating to Safety and Electric Supply) Regulations, 2011.

13.2 Non-Compliance & Derogation

- 13.2.1 If any intra-state user is not in a position to comply, or fails to comply, with any of the provision(s) of the Grid code, it shall inform SLDC without delay of the reason for its non-compliance and shall take remedy for its non-compliance promptly.
- 13.2.2 Wrong declaration of capacity, non compliance of SLDC's load dispatch instructions, non-compliance of SLDC's instructions for backing down without adequate reasons, non-furnishing of data etc. shall constitute non-compliance of the Grid Code, which shall be subject to penal action as may be decided by the Commission.
- 13.2.3 Derogation, if any, for any particular section or chapter of this Grid Code shall be with the permission of the Commission and for a specified time. Derogation of any requirement of the Grid Code shall be an exception and not the norm, and will be allowed only when it is not possible, and not just difficult or inconvenient, for the intra-state user to comply in the required time. Failure to comply with time period allowed for derogation by any intra-state user shall carry a penalty as decided by Commission.

13.3 Service of Notice

Any letter, order or document addressed by the SLDC/licensee to the intra-state user shall be deemed to be duly given, if served in writing and delivered by hand at, or sent by post/ courier / fax / e-mail to the intra-state user address specified in the consumer's application or in the agreement with the intra-state user if entered into or as subsequently notified to the licensee. In case there is no person on the premises to whom the notice can with reasonable diligence be delivered, the notice may be served by affixing it on some conspicuous part of the premises.

All communications to the SLDC/licensee shall be made to the address as provided by SLDC/licensee.

13.4 Unforeseen Circumstances / Force Majeure

(a) Unforeseen Circumstances If any circumstances / force majeure not envisaged in the provisions of the Grid Code, should arise, the licensee/SLDC shall, to the extent 102 reasonably practicable in the circumstances, consult promptly and in good faith, all affected parties in an effort to reach an agreement as to what should be done. If an agreement cannot be reached between the licensee and intra-state user within the time available, the licensee/SLDC shall determine it in the manner to the best of its ability.

Wherever the licensee/SLDC makes such a determination, it shall do so having regard, wherever possible, to the views expressed by the affected parties and, in any event, to what is reasonable in the circumstances. Each party shall comply with all instructions given to it by the licensee/SLDC. The licensee/SLDC shall promptly refer all such unforeseen circumstances/force majeure, and any such determination to the Commission.

(b) Force Majeure:

Any event which is beyond the control of the intra state user involved which they could not foresee or with reasonable amount of diligence could not have foreseen or which could not be prevented and which substantially affect the performance by either agency such as but not limited to: -

- (i) Acts of God, natural phenomena, including but not limited to floods, droughts, earthquakes and epidemics;
- (ii) Acts of any Government domestic or foreign, including but not limited to war declared or undeclared, hostilities, priorities, quarantines, embargoes;
- (iii) Riot or civil commotion;
- (iv) Grid's failure not attributable to agencies involved.”

13.5 Interpretation:

These conditions shall be read and construed as being subject, in all respects, to the provisions of the Indian Governmental Instrumentality and having force of law and Electricity Act, 2003, and the rules or/and regulations framed there under, including those issued/framed by Commission as amended or re-enacted from time to time. In case of any dispute regarding the meaning or scope or interpretation of this Code, the interpretation of the Commission shall be final and binding on all concerned.

13.6 Power to remove difficulties/Power to relax:

If any difficulty arises in giving effect to any of the provisions of this code, the matter may be referred to the Commission who after consulting the parties affected, where considered necessary, may pass any general or special order, not inconsistent with the provisions of the Act or any other enactment relating to transmission supply of electricity for the time being in force, which appears necessary or expedient, for the purpose of removing the difficulty.

The Commission may issue directions relieving any Transmission Licensee or Intra-state user, either suo-motu or based on an application submitted by such Transmission Licensee or Intra-state user, of their obligations to implement or comply with the State Grid Code to the extent as may be stipulated in the directions.

13.7 Jurisdiction of Court:

All proceedings arising out of this Code and the agreement made there under shall be filed only in the Court under whose jurisdiction the agreement was executed.

13.8 Repeal

With the notification of this grid code the Chhattisgarh State Electricity Grid Code, 2007 and its modification issued on dated 09-09-2008 shall cease to operate from the date of notification of this grid code.

13.9 Savings

Nothing in this Code shall be deemed to limit or otherwise affect the inherent power of the Commission to make such orders as may be necessary to meet the ends of justice or to prevent abuses of the process of the Commission.

Nothing in this Code shall bar the Commission from adopting in conformity with the provisions of the Act, a procedure, which is at variance with any of the provisions of this Grid Code, if the Commission, in view of the special circumstances of a matter or class of matters and for reasons to be recorded in writing, deems it necessary or expedient for dealing with such a matter or class of matters.

Nothing in this Code shall, expressly or impliedly, bar the Commission dealing with any matter or exercising any power under the Act for which no provision has been made in the Grid Code, and the Commission may deal with such matters, powers and functions in a manner it thinks fit.

Note: In case of any difference in the interpretation or understanding of the provisions of the Hindi version of these Regulations with those of the English version, the decision of the Commission shall be final and binding.

By order of the Commission
(N.K. Rupwani)
Secretary

Annexure A

PLANNING DATA REQUIREMENTS (CLAUSE 3.4)

PART - I GENERATION

(To be furnished by the Generating Company to STU)

A-1 Standard Planning Data (Generation)

A.1.1 THERMAL

I. GENERAL

1. Site	Furnish location map (schematic) showing roads, Railway lines, transmission lines, rivers and reservoirs if any.
2. Approximate period of construction	
3. Annual Generation in Million KWH	

II. CONNECTION

1. Connection point / interface point	Furnish single line diagram of the proposed connection with the transmission system with clear indication of possibility for right of way for unobstructed outlet
2. Step up voltage for connection kV	

III. STATION CAPACITY:

1. Total Generating Station Capacity (MW)	
2. No. of Units and Unit size MW.	State whether development will be carried out in phases and if so, furnish details

IV.

GENERATING UNIT DATA:

1. Steam Generating Unit	
Type, capacity, steam pressure, steam temperature etc-	
2. Steam turbine	
Type, Capacity	
3. Generator	
(a) Make and Type	
(b) Rating (MVA)	
(c) Terminal Voltage (kV)	
(d) Rated Power Factor	
(e) Reactive Power capability (MVar) in the range 0.95 leading and 0.85 lagging.	
(f) Short Circuit Ratio	

(g) Direct axis transient reactance (% on MVA rating)	
(h) Direct axis sub-transient reactance (% on MVA rating)	
(i) Auxiliary Power requirement	
(j) MW and MVA _r Capability curve	
2. Generator Transformer	
(a) Type	
(b) Rated Capacity (MVA)	
(c) Voltage Ratio (HV/LV)	
(d) Tap change range (+% to -%)	
(e) Percentage Impedance (Positive Sequence at Full load).	

A.1.2 DETAILED PLANNING DATA (GENERATION) THERMAL GENERATING

STATIONS:

I GENERAL:

- Name of Generating Station:
- No. of capacity of Generating Units (MW):
- Single line diagram of Generating Station and switchyard
- Relaying and metering diagram
- Neutral Grounding of Generating Units
- Excitation control
- Earthing arrangements with earth resistance values
- Communication – Details of PLCC and other communication equipment installed.

II PROTECTION AND METERING:

- Full description including settings for all relays and protection systems installed on the Generating Unit, Generating Unit Transformers, Auxiliary Transformer and electrical motor of major equipment viz. boiler feed pump, ID fans, condensate extraction pump etc.
- Full description including settings for all relays installed on all outgoing feeders from Generating Station switchyard, tie circuit breakers, incoming circuit breakers.
- Full description of inter-tripping of circuit breakers at connection (point(s) / Interface points (s) with the transmission system.
- Most probable fault clearance time for electrical faults on the intra-state user's system.
- Full description of operational and commercial metering schemes.
- Breaker operating time counting from initiation of protective relay to the opening of breaker.

III SWITCHYARD:

- In relation to Interconnecting Transformers between EHV/HV transmission system and the Generator Transformer Voltage System:
 - Rated MVA
 - Voltage Ratio
 - Vector Group
 - Positive sequence reactance (Maximum, minimum, normal tap (% on MVA) (e)
 - Positive sequence resistance (Maximum, minimum, normal tap (% on MVA) (f)
 - Zero sequence reactance (% on MVA)
 - Tap changer range (+% to -%) and steps
 - Type of tap changer (OFF/ON)
 - Details of reactors, and other circuits connected to tertiary winding of ICT.

- (j) Method of grounding.
- 2. In relation to switchgear including circuit breakers, isolators on all circuits connected to the points of connection:
 - (a) Rated Voltage (kV)
 - (b) Type of Breaker (MOCB/ABCD/SF₆---
 - (c) Rated short circuit breaking current (kA) 3 phase
 - (d) Rated short circuit breaking current (kA) 1 phase
 - (e) Rated short circuit making current (kA) 3 phase
 - (f) Rated short circuit making current (kA) 1phase
 - (g) Provisions of auto reclosing with details
 - (h) Details of instrument transformers.
- 3. Lightning arresters, technical data.
- 4. Communication – Details of PLCC and other communication equipment installed at connection point(s) / interface point(s).
- 5. Basic insulation level (kv):
 - (a) Bus bar
 - (b) Switchgear
 - 107
 - (c) Transformer bushings
 - (d) Transformer windings

IV GENERATING UNITS:

A. PARAMETERS OF GENERATING UNITS:

- 1. Rated terminal voltage (kV)
- 2. Rated MVA
- 3. Rated MW
- 4. Inertia constant H(MW Sec./MVA) of Generator
- 5. Short circuit ratio
- 6. Direct axis synchronous reactance(% on MVA) (Both unsaturated and saturated)
- 7. Direct axis transient reactance(% on MVA) (Both unsaturated and saturated)
- 8. Direct axis sub-transient reactance(% on MVA) (Both unsaturated and saturated)
- 9. Quadrature axis synchronous reactance(% on MVA) (Both unsaturated and saturated)
- 10. Quadrature axis transient reactance(% on MVA) (Both unsaturated and saturated)
- 11. Quadrature axis sub-transient reactance(% on MVA) (Both unsaturated and saturated)
- 12. Direct axis transient open circuit time constant (Sec) T'd₀
- 13. Direct axis sub-transient open circuit time constant (Sec) T'd₀
- 14. Quadrature axis transient open circuit time constant (Sec) T'd₀
- 15. Quadrature axis sub-transient open circuit time constant (Sec) T'd₀
- 16. Stator resistance (Ohm)
- 17. Stator leakage reactance (Ohm) T_a
- 18. Stator time constant (Sec)
- 19. Rated field current (A)

20. Open circuit saturation characteristic for various terminal voltages giving the exciting current to achieve the same.
21. Generator Capability Curve
22. Rated stator current (A)
23. Phase connection
24. Number of terminals brought out
25. Rated speed(rpm)
26. Rated frequency (Hz.)
27. Efficiency at MCR condition (percent)
28. Negative sequence current capability (I_2T)
29. Capacitance of generator stator winding to ground (microF/ph)
30. DC Resistance of rotor at 20° C (in ohm)
31. Zero sequence reactance X_0 (Percentage)
32. Negative sequence reactance X_2 (Percentage)
33. Negative sequence reactance R_2 (Percentage)
34. Sub-Transient S-C time constant (in second)
 - a. Direct axis T''_d
 - b. Quadrature axis T''_q
35. Transient S-C time constant (in second)
 - a. Direct axis T'_d
 - b. Quadrature axis T'_q
36. Machine saturation at 1.0 pu voltage in p.u.
37. Machine saturation at 1.2 pu voltage in pu
38. Percentage regulation
39. Short circuit characteristics curves.

B. PARAMETERS OF EXCITATION CONTROL SYSTEM:

1. Type of Excitation
2. Maximum Field voltage
3. Minimum Field voltage
4. Rated Field voltage
5. Gain factor
6. Feed back strength
7. Time constant for control amplifier
8. Time constant for Exciter
9. Time constant for Feed Back
10. Output voltage of control amplifier
11. Maximum output voltage of control amplifier
12. Minimum output voltage of control amplifier
13. Details of excitation loop in block diagrams showing transfer functions of individual elements using IEEE symbols along with set values
14. Dynamic characteristics of over – excitation Limiter
15. Dynamic characteristics of under – excitation Limiter
16. Exciter IEEE model / Type No.
17. Exciter response time.

C. PARAMETERS OF GOVERNOR / TURBINE:

1. Governor average gain (MW/Hz)
2. Speeder motor setting range
3. Time constant of steam or fuel Governor valve
4. Governor valve opening limits
5. Governor valve rate limits
6. Governor valve rate limits
7. Time constant of Turbine (HP, IP, LP)
8. Governor block diagram showing transfer functions of individual elements using IEEE symbols alongwith set valves
9. Type of governor, whether IEEE standard governor used
10. Regulation and droop
11. Fraction of total power generated HP, IP, LP turbine.
12. Maximum velocity limit HP, IP, LP turbine
13. Minimum velocity limit HP, IP, LP turbine.

D. OPERATIONAL PARAMETERS:

1. Min. notice required for synchronizing a Generating Unit for De-synchronization.
2. Min. time between synchronizing different Generating Units in a Generating Station.
3. The minimum block load requirements on synchronizing
4. Time required for synchronizing a Generating Unit for the following conditions:
 - (a) Hot
 - (b) Warm
 - (c) Cold
5. Maximum Generating Unit loading rate for the following conditions:
 - (a) Hot
 - (b) Warm
 - (c) Cold
6. Minimum load without oil support (MW)

V. PLANT PERFORMANCE:

1. Daily Demand Profile (Last Year)	Half hourly integrated demand through out the day
2. Units Generated (Million KWH)	
3. Units consumed in Auxiliaries (Million KWH)	
4. Units supplied from system to Auxiliary Load	
5. Seasonal Generation	

A.1.3 HYDRO ELECTRIC

I.

GENERAL:

1. Site	Furnish location map (schematic) showing roads, Railway lines, transmission lines, rivers and reservoirs if any.
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Whether storage type, run of river type	
Full reservoir level	
Tail race level	
Design head	
Minimum draw down level	
Reservoir level v/s energy poetential curve	
2. Approximate period of construction	
3. Annual Generation in Million KWH	

II. CONNECTION:(AS APPLICABLE TO THERMAL GENERATING STATIONS MENTIONED ABOVE) **III.****STATION CAPACITY:**

(AS APPLICABLE TO THERMAL GENERATING STATIONS MENTIONED ABOVE)

IV.**GENERATION UNIT DATA:**

1. Operating Head	
a)Maximum	
b)Minimum	
c)Average	
Hydro Unit	
a) Capability to operate as synchronous condenser	
b) Water head versus discharge curve(at full and part load)	
c) Power requirement or water discharge while operating as synchronous condenser	
2.Turbine	
Type ,Capacity	
3.Generator	
(a) Make and Type	
(b) Rating (MVA)	
(c) Terminal Voltage (kV)	
(d) Rated Power Factor	
(e) Reactive Power capability (MVAr) in the range 0.95 leading and 0.85 lagging.	
(f) Short Circuit Ratio	
(g) Direct axis transient reactance (% on MVA rating)	
(h) Direct axis sub-transient reactance (% on MVA rating)	

(i) Auxiliary Power requirement	
2. Generator Transformer	
(a) Type	
(b) Rated Capacity (MVA)	
(c) Voltage Ratio (HV/LV)	
(d) Tap change range (+% to -%)	
(e) Percentage Impedance (Positive Sequence at Full load).	

A.1.4 HYDROELECTRIC STATIONS:**I. GENERAL:**

1. Name of Generating Station
2. No. and capacity of units (MW)
3. Expected level of generation (MU)
4. Period of generation (in months) over year
5. Whether the plant is based on water released from dam/canal for irrigation purposes
6. Rating of all major equipments.
7. Single line diagram of Generating Station and switchyard
8. Relaying and metering diagram
9. Neutral grounding of generator
10. Excitation control
11. Earthing arrangements with earth resistance values
12. Communication - Details of PLCC and other communication equipment installed.

II. PROTECTION:

(AS APPLICABLE TO THERMAL GENERATING STATIONS MENTIONED ABOVE)

III. SWITCH YARD:

(AS APPLICABLE TO THERMAL GENERATING STATIONS MENTIONED ABOVE)

IV. GENERATION UNITS:**A. PARAMETERS OF GENERATING UNITS:**

(AS APPLICABLE TO THERMAL GENERATING STATION MENTIONED ABOVE)

B. PARAMETERS OF EXCITATION CONTROL SYSTEM:

(AS APPLICABLE TO THERMAL GENERATING STATION MENTIONED ABOVE)

C. PARAMETERS OF GOVERNOR / TURBINE:

(AS APPLICABLE TO THERMAL GENERATING STATION MENTIONED ABOVE)

D. OPERATIONAL PARAMETERS:

1. Minimum notice required for synchronizing a Generating Unit for De-synchronization.
2. Minimum time between synchronizing different Generating Units in a Generating Station
3. Minimum block load requirements of Synchronizing.

A1.5 FOR THERMAL**I. GENERATING STATIONS, if desired by STU:****CONNECTION:**

1. Report of studies of parallel operation with transmission system: (a)
Load flow studies
(b) Stability studies
(c) Short Circuit studies
2. Proposed connection with transmission system
(a) Voltage

(b) No. of circuits

(c) Connection point (s) / interface point (s)

II. HYDROELECTRIC GENERATING STATIONS:

(AS APPLICABLE TO THERMAL GENERATING STATIONS MENTIONED ABOVE)

PART II – DISTRIBUTION**(To be furnished by the Distribution Company to STU)****B-1 Standard Planning Data Distribution****I. GENERAL:**

1. Single Line Diagram 2. Consumer Data

: Licensee-wise upto 33kV Substations

Furnish category wise number of consumers, their connected Loads to the best judgment of the distribution licensee.

3. Reference to are officers

presently incharge of the

distribution.

II. CONNECTION:

1. Connection points/interface points:

Furnish single line diagram showing connection points / interface points.

2. Voltage of supply at connection

points/interface points:

3. Names of grid Sub-station feeding the connection pints / interface points:

III. LINES AND SUB-STATIONS:

1. Line Data: Furnish length of line and voltages (EHV level)

2. Sub-station Data:

IV LOADS

Furnish transformer details of 220/132kV, 132/33kV, 33/11kV, Sub-stations, capacitor installations.

1. Loads drawn at connection points/ interface points:	If the distribution licensee receive power at a number of connection points in a compact area, which are interconnected in a ring, then such distribution licensee shall forward the overall load drawn for overall Area of Supply as well as at each connection point with the variation or tolerance as mutually discussed and agreed upon with the STU
2. Details of loads fed at EHV, if any	Give name of consumer, voltage of supply, contract demand and name of grid Sub-station from which the line is drawn, length of EHT line from grid Sub-station to consumer's Premises.

V. DEMAND DATA (FOR ALL LOADS 5 MW AND ABOVE):

1. Type of Load & Rating in HP or KW	State whether furnace loads, rolling mills, traction loads, other industrial loads, pumping loads etc.
2. Rated voltage:	
3. Electrical loading of equipment	State number and size of motors, rating or arc furnaces/induction furnace, types of drive and control arrangements.
4. Sensitivity of load to voltage and Frequency of supply:	
5. Maximum harmonic content of Load:	
6. Average and maximum phase unbalance of Load:	
7. Nearest Substation from which load is to be fed:	
8. Location map to scale:	Map shall show the location of load with reference to lines and sub-stations in the vicinity.

VI**LOAD FORECAST DATA:**

1. Peak load for connection point / interface point as well as peak load and energy forecast of Area of Supply for each of the succeeding 10 years.

2. Details of methodology and assumptions on which forecasts are based 3.

Details of load 5MW and above:

- a. Name of prospective consumer
- b. Phasing of load.

B-2 DETAILED PLANNING DATA (Distribution)**I. GENERAL:**

1. Schematic Single Line Diagram of Distribution System (showing distribution lines from connection point / interface points with transmission system 220kV/ 132kV, 132/33kV, & 33/11 kV Substations, consumer bus if fed directly from transmission system).
2. Numbering and nomenclature of lines and substations (Identified with feeding grid Substations of the transmission system and concerned 220kV/132kV, 132/33kV, and 33/11kV substation).

II CONNECTION:

1. Connection point / interface points (Furnish details of existing arrangement of connection).
2. Details of metering of connection points / interface points.

B.3 DETAILED PLANNING DATA (Distribution)

(For submission on request by STU)

I CONNECTION:

1. Connection pints/ interface points as applied for:
 - (a) New
 - (b) Upgrading existing connection
2. Changes in metering at connection pints / interface points.

II. LOADS:

1. Details of major loads of 1 MW and above to the contracted for next ten years.

Annexure – B.

DETAILED TRANSMISSION SYSTEM DATA (CLAUSE 3.5)

(To be furnished to the Intra-state user on request by STU/ Transmission Licensee)

B-1 Standard Planning Data (Transmission)

1. Name of the line: (Indicating Generating Stations and Substations to be connected)
2. Voltage of line (kV):
3. No. of circuits:
4. Route length (CKM):
5. Conductor sizes:
6. Line parameters (PU on 100 MVA base or ohmic values)
7. Approximate power flow MW & MVA:
8. Line Route (Topographic Sheets) 9. Purpose of connection:
10. Approximate period of construction:

Resistance/KM

Inductive Reactance/KM Suceptance/KM

Reference to scheme, wheeling to other States etc.

B-2 DETAILED SYSTEM DATA (Transmission):I. GENERAL:

- 1) Single line diagram of the transmission system upto 33kV bus at grid sub-station.
- 2) Name of substation
- 3) Generation Station connected
- 4) Number and length of circuits
- 5) Interconnecting Transformers
- 6) Substation bus layouts
- 7) Power transformers
- 8) Reactive compensation equipment
 - (a) The details of capacitors installed
 - (b) Additional capacitors to be commissioned along with additional loads.
- 9) Lightning arresters
- 10) Bus and / or line reactors

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II SUB-STATION LAYOUT DIAGRAMS SHOWING:

1. Bus bar layouts
2. Electrical circuitry, lines, cables, transformers, switchgear etc.
3. Phasing arrangements
4. Earthing arrangements
5. Switching facilities and interlocking arrangements 6.
- Operating voltages
7. Numbering and nomenclature
 - (a) Transformers

- (b) Circuits
- (c) Circuit breakers
- (d) Isolating switches

III LINE PARAMETERS: (FOR ALL CIRCUITS)

1. Designation of line
2. Length of line (KM)
3. No. of circuits, size and type of conductor, thermal rating
4. Per circuit values
 - a. Operating voltage (kV)
 - b. Positive phase sequence reactance – ohms/KM
 - c. Positive phase sequence resistance – ohms/KM
 - d. Positive phase sequence susceptance e. Zero phase sequence reactance – ohms/KM
 - f. Zero phase sequence resistance – ohms/KM
 - g. Zero phase sequence susceptance – ohms/KM

IV.

TRANSFORMER PARAMETERS:

(FOR ALL TRANSFORMERS SUB-STATION-WISE)

1. Rated MVA
2. Voltage ratio
3. Vector group
4. Positive sequence reactance on rated MVA base (Max. Min & normal)
5. Positive sequence resistance on rated MVA base (max. min. & normal)
6. Zero sequence reactance on rated MVA base
7. Tap change range (+% to -%) and steps
8. Details of tap changer (OFF/ON)
9. Neutral grounding transformer/resistor values
10. % Impedance (Max./Min/Normal Tap)

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V. EQUIPMENT DETAILS: (FOR ALL SUB-STATIONS):

1. Circuit breakers
2. Isolating switches
3. Current transformers
4. potential transformers
5. Lightning arresters
6. Earthing switches

VI. RELAYING AND METERING:

1. Relay protection installed for all transformers and feeders along with their settings and level, of coordination with other uses.
2. Metering Details.

VII SYSTEM STUDIES:

1. Load flow studies (Peak and lean load for maximum Hydro and maximum Thermal Generation).
2. Transient stability studies for 3 Phase fault in critical lines, and single pole reclosing for 400 kV lines and critical 220kV lines.
3. Dynamic stability studies
4. Short circuit studies (3 phase and single phase to earth)
5. Transmission and distribution losses in the system.

VIII: DEMAND DATA: (FOR ALL SUB-STATIONS)

1. Demand Profile (Peak and off Peak load)
7. Forecast for next 5 years.

IX REACTIVE COMPENSATION EQUIPMENT:

1. Type of equipment (fixed or variable)
2. Capacities and/or inductive rating (Voltage and MVar) or its operating range.
3. Details of control
4. Connection point/ interface point to the system.

B.3 DETAILED PLANNING DATA (Transmission):**I. CONNECTION:-**

1. Single Line Diagram showing position of connection. 2. Sub-station layout diagram
 - (a) New
 - (b) Addition and alteration
3. Revised system studies with changed parameters
4. Connection point / interface point:
 - a. Voltage
 - b. Length of circuit
 - c. Circuit parameters
 - d. PLCC facilities
 - e. Relaying with inter tripping arrangements to inter trip system breaker at connection point / interface point to isolate on fault
 - f. Metering at connection point / interface point
 - g. Other communication facility

Annexure - C

ORIGINAL
(Safety) Form

PERMIT TO WORK ON ELECTRICAL EQUIPMENT OR LINE (Clause 10.2.1)

Issued to

I hereby declare that following electrical equipment / line is dead and isolated from all line conductors:-

Caution notices have been affixed to all the controlling switches,

Here state exactly the electrical equipment / line, on which it is safe to work. Here state exactly the points the electrical equipment / line is connected to earth.

All Other Equipment / Line are Live

Here state any specific limits or instructions which issuer may like to add :-

Signature

Designation

Date and Time

(when Permit is by phone. The name of the Authorized person at apposite end must be noted.)

Issuer (Sending end.)

Serial number of permit

(when permit is by phone Receiving end)

Note: 1) This card after being signed by a competent person for the work to proceed, is to be handed to the authorized person in charge of the work and retained by that person until the work is completed or stopped by the authorized person.

- 2) The electrical equipment mentioned hereon must not be again made alive until this card has been signed and returned by the person in charge of the work to the issuer of permit.

I hereby declare that all man, earthing and materials under my charge have cleared the site equipment / line and men have been warned that it is no longer safe to work on the electrical equipment specified on the card.

Signature

Designation

Date :

Time :

I hereby declare this card canceled.

Signature

Designation

Date :

Time :

Annexure - D

DUPLICATE

(Safety) Form

PERMIT TO WORK ON ELECTRICAL EQUIPMENT OR LINE (Clause 10.2.1)

Issued to

I hereby declare that following electrical equipment / line is dead and isolated from all line conductors:-

Caution notices have been affixed to all the controlling switches,

Here state exactly the electrical equipment / line, on which it is safe to work.

Here state exactly the points the electrical equipment / line is connected to earth.

All Other Equipment / Line are Live

Here state any specific limits or instructions which issuer may like to add :- (.....

Signature

Designation

Date and Time

(when Permit is by phone. The name of the Authorized person at apposite end must be noted.)

Issuer(Sending end.)

Serial number of permit

(when permit is by phone Receiving end)

(to be used when permit is applied over telephone)

APPLICATION

From To

.....

At

.....

Please issue me permit to work on

.....

.....

Signature

Designation