PROGRAM:

clc;

Pm = input('Generator output power in p.u. Pm — E = input('Generator e.m.f. in p.u. E —

V = input('lnfinite bus-bar voltage in p.u. V = '); Xl = input('Reactance before Fault in p.u. Xl = ');

X2 = input('Reactance during Fault in p.u. X2 = ');

X3 = input('Reactance after Fault in p.u. X3 = 

D = input('Enter the Damping ratio = '); f0 = input('Enter the frequency of the system — H = input('Enter the value of inertia constant =



d0=asin(Pm/Pmax) Ps=Pmax\*cos(d0) wn=sqrt(pi\*60/H\*Ps)



wd=wn\*sqrt(l -zA2) fd=wd/(2\*pi) tau=l/(z\*wn) th=acos(z)





\*sin(wd\*t + th);







figure(l), subplot(2, 1 , 1), plot(t, d), grid xlabel('t, sec'), ylabel('Delta, degree') subplot(2,1 ,2), plot(t, f), grid xlabel('t, sec'), ylabel('f, Hz')

OUTPUT:

Generator output power in p.u. Pm = 0.6

Generator e.m.f. in p.u. E = 1.35 Infinite bus-bar voltage in p.u. V = 1

Reactance before Fault in p.u. Xl = 0.65

Reactance during Fault in p.u. X2 = inf

Reactance after Fault in p.u. X3 = 0.65

Enter the Damping ratio = 0.138

Enter the frequency of the system = 60

Enter the value of inertia constant = 9.94

Pmax = 2.0769

0.2931

1.9884 wn = 6.1405

0.2131 wd = 5.9995

fd = 0.9549

tau = 0.7643

th = 1.3561

|  |
| --- |
| 30  1.5  2  3  t, sec  60.1  60  0  2  3  59.9  59.8  1.5 t, sec |

PROGRAM:

clc;

output power in p.u. Pm : E=input('Generator e.m.f. in p.u. E = ');

V=input('lnfinite bus-bar voltage in p.u. V = '); Xl=input('Reactance before Fault in p.u. Xl = '); X2=input('Reactance during Fault in p.u. X2 = I);

X3=input('Reactance after Fault in p.u. X3 = ');

Pel  ;





delta = 0:.01 :pi;

Pel —Pel max\*sin(delta); Pe2=Pe2max\*sin(delta); Pe3=Pe3max\*sin(delta); d0=asin(Pm/Pe1 max) ; dmax=pi-asin(Pm/Pe3max); cosdc=(Pm\*(dmax-d0)+Pe3max\*cos(dmax)-Pe2max\*cos(d0))/(Pe3max-Pe2max); dc=acos(cosdc);





dc—dc\* 1 80/pi;

H=input('To find to enter Inertia Constant H, (or 0 to skip) H —

if H 0



dcr=dc\*pi/180; tc=sqrt(2\*H\*(dcr-d0r)/(pi\*60\*Pm)); else end

fprintf('\nlnitial power angle —- %4.3f

fprintf('Maximum angle swing = %4.3f \n',dmax); fprintf('Critical clearing angle = %4.3f \n\n', dc)

if  H-=O

fprintf('Critical clearing time = %4.3f sec. \n\n', tc)

else end





80/pi;



xc=[dc dc]\*180/pi; Pe3max\*sin(dc)]; xm=[dmax dmax]\*180/pi; Pe3max\*sin(dmax)];

.1 :dc);

y=Pe2max\*sin(x\*pi/180);



y2=Pe2max\*sin(dc\*pi/180); x dc];



xx=dc:. 1 :dmax; h=Pe3max\*sin(xx\*pi/180) ; xx=[dc xx dmax];



delta—delta\* 1 80/pi; h=figure; figure(h); fill(x,y,'m') hold; fill(xx,hh,'c')

plot (delta, Pel ,'- , delta, Pe2, 'r-', delta, Pe3, 'g-', Pmx, Pmy, 'b-', xo, yo, xc, yc, xm, ym), grid title('Application of equal area criterion to a critically cleared system')

xlabel('Power angle, degree'), ylabel('Power, per unit') text(5, 1.07\*Pm, 'Pm') text(50,1 .05\*Pe1 max,['Critical clearing angle = ',num2str(dc)]) axis([0 180 0 1 .1 \*Pel max]) hold off;

OUTPUT:

Generator output power in p.u. Pm : 0.8

Generator e.m.f. in p.u. E = 1.17

Infinite bus-bar voltage in p.u. V = 1

Reactance before Fault in p.u. Xl = 0.65

Reactance during Fault in p.u. X2 = inf

Reactance after Fault in p.u. X3 = 0.65

To find to enter Inertia Constant H, (or 0 to skip) H = 5

Initial power angle = 26.388 Maximum angle swing = 153.612 Critical clearing angle = 84.775

Critical clearing time = 0.260 sec.

Current plot held

|  |
| --- |
| Application of equal area criterion to a critically cleared system  o 20 40 60 80 100 120 140 160 180  Power angle, degree |