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LAMPIRAN

Lampiran 1. Fungsi Program genof()

```
function [data, allOffset, allPanel]=genof(x)

for i = 1:x(size(x,1),1)
    offset = []
    for j = 1: size(x,1)
        if (i == x(j,1)) then
            offset = [offset; x(j,2:4)]
            data.station (i).offset = [offset]
        end
    end
end
// offset lambung selesai

id = 0
offset =[]
for i = 1: size(data.station.offset)
    R = [flipdim(data.station(i).offset,1)]
    L = [data.station(i).offset(2:10,1) data.station(i).offset(2:10,2)*-1
data.station(i).offset(2:10,3)]
    re = [R;L]
    id4=[]
    for j = 1: size(re,1)
        id = id +1
        offset = [offset; id re(j,:)]
        id4=[id4;id]
    end
    data.station(i).re = [re id4]
end
// panel lambung selesai

idx = 0 // index untuk offset lambung
```

```

panel = []
for i = 1 : length(data.station.re)-1
    n=[]
    for j = 1 :size(data.station(i).re,1)-1
        idx = idx + 1
        t1 = data.station(i).re(j,4)
        t2 = data.station(i).re(j+1,4)
        t3 = data.station(i+1).re(j,4)
        t4 = data.station(i+1).re(j+1,4)
        panel = [panel;idx t3 t4 t2 t1 t3] //membuat panel
    end
end
offset2=[]
for i = 1:size(offset,1)
    offset2 = [offset2; offset(i,1:3) offset(i,4)-draft]
end
allOffset=[]
allPanel=[]
t = 15/1000 // ketebalan 15 mm
[allOffset,allPanel] = arrangeData(allOffset,allPanel,offset2,panel,t)

sekat = [ 1;7;12; 18; 24; 30; 35;38] // start sekat
idt = 0
for rl = 1 : 2
    for n = 1 :length(sekat)
        o = sekat(n,1)
        offset =[]
        idx = 0
        for i = 1:size(data.station(1).offset,1)

```

```

for j = 1:size(data.station(1).offset,1)
    if (j <= i) then
        idx = idx +1
        if rl ==1 then
            offset = [offset;idx data.station(o).offset(j,1)
data.station(o).offset(j,2) data.station(o).offset(i,3)-draft]
        else
            offset = [offset;idx data.station(o).offset(j,1) data.station(o).offset(j,2)*-1
data.station(o).offset(i,3)-draft]
        end
    end
end
end
end
if rl ==1 then idt = idt + 1;data.sekat(idt).offset = [offset; offset(:,1)+55
offset(:,2) offset(:,3)*-1 offset(:,4)] end
panel = [] //panel buritan dan haluan
panel2=[]
idx = 0
j = 1
for i = 1:size(offset,1)-10
    if rl ==1 then
        if offset(i,3) < offset(i+1,3) && offset(i,4) == offset(i+1,4)then
            t1 = offset(i,1)
            t2 = offset(i+1,1)
            t3 = offset(i+j,1)
            t4 = offset(i+j+1,1)
            idx = idx+1
            panel = [panel; idx t1 t2 t4 t3 t1]
        else
            idx = idx + 1

```

```

        t1 = offset(i,1)
        t2 = offset(i+j,1)
        t3 = offset(i+j+1,1)
        panel=[panel; idx t1 t2 t3 t1 t1]
        j = j + 1
    end
else
    if offset(i,3) > offset(i+1,3) && offset(i,4) == offset(i+1,4) then
        t1 = offset(i,1)
        t2 = offset(i+1,1)
        t3 = offset(i+j,1)
        t4 = offset(i+j+1,1)
        idx = idx+1
        panel = [panel; idx t1 t3 t4 t2 t1]
    else
        idx = idx + 1
        t1 = offset(i,1)
        t2 = offset(i+j,1)
        t3 = offset(i+j+1,1)
        panel=[panel; idx t3 t1 t2 t3 t3]
        j = j + 1
    end
end
end
if o == 1 || o == length(data.station.offset) then
    if o == 1 then panel = [panel(:,1) flipdim(panel(:,2:6),2)] end
    t = 15/1000 // ketebalan 15 mm
    [allOffset,allPanel] = arrangeData(allOffset,allPanel,offset,panel,t)
end
end
end

```

```

end
zz=[panel(:,2:6)]
zzz= [panel(:,1) flipdim(zz,2); panel(:,1)+45 zz+55]

offset=[]           // membuat deck
for i = 1: length(data.station.re)
    for j = 1: size(data.station(i).re,1)

        offset = [offset; data.station(i).re(j,4) data.station(i).re(j,1:2)
data.station(i).re(1,3) ]
    end
end
offsetdeck = [offset(:,1:3) offset(:,4)-draft]
idx = 0           // membuat panel
panel = []
for i = 1 : length(data.station.re)-1
    for j = 1 :size(data.station(i).re,1)-1
        idx = idx + 1
        t1 = data.station(i).re(j,4)
        t2 = data.station(i).re(j+1,4)
        t3 = data.station(i+1).re(j,4)
        t4 = data.station(i+1).re(j+1,4)
        panel = [panel;idx t1 t2 t4 t3 t1] //membuat panel
    end
end
t = 8/1000// ketebalan 8 mm
[allOffset,allPanel] = arrangeData(allOffset,allPanel,offsetdeck,panel,t)
//plotMesh(allOffset,allPanel)
t = 10/1000

```

```

// tangki tangki//
data.tank(1).offset = [allOffset(115:228,1)-114 allOffset(115:228,2:4);
data.sekat(2).offset(:,1)+114 data.sekat(2).offset(:,2:4) ;
data.sekat(3).offset(:,1)+114+110 data.sekat(3).offset(:,2:4)]

data.tank(1).panel = [allPanel(109:198,1)-108 allPanel(109:198,2:6)-114 ; zzz(:,1)+
90 flipdim(zzz(:,2:6),2)+114 ; zzz(:,1)+ 90+90 zzz(:,2:6)+114+110 ]

data.tank(2).offset = [allOffset(210:342,1)-209 allOffset(210:342,2:4) ;
data.sekat(3).offset(:,1)+133 data.sekat(3).offset(:,2:4) ;
data.sekat(4).offset(:,1)+133+110 data.sekat(4).offset(:,2:4)]

data.tank(2).panel = [allPanel(199:306,1)-198 allPanel(199:306,2:6)-209 ; zzz(:,1)+
108 flipdim(zzz(:,2:6),2)+133 ; zzz(:,1)+ 108+90 zzz(:,2:6)+133+110 ]

data.tank(3).offset = [allOffset(324:456,1)-323 allOffset(324:456,2:4);
data.sekat(4).offset(:,1)+133 data.sekat(4).offset(:,2:4) ;
data.sekat(5).offset(:,1)+133+110 data.sekat(5).offset(:,2:4)]

data.tank(3).panel = [allPanel(307:414,1)-306 allPanel(307:414,2:6)-323 ; zzz(:,1)+
108 flipdim(zzz(:,2:6),2)+133 ; zzz(:,1)+ 108+90 zzz(:,2:6)+133+110 ]

data.tank(4).offset = [allOffset(438:570,1)-437 allOffset(438:570,2:4) ;
data.sekat(5).offset(:,1)+133 data.sekat(5).offset(:,2:4) ;
data.sekat(6).offset(:,1)+133+110 data.sekat(6).offset(:,2:4)]

data.tank(4).panel = [allPanel(415:522,1)-414 allPanel(415:522,2:6)-437 ; zzz(:,1)+
108 flipdim(zzz(:,2:6),2)+133 ; zzz(:,1)+ 108+90 zzz(:,2:6)+133+110 ]

```



```

data.tank(5).offset = [allOffset(552:665,1)-551 allOffset(552:665,2:4) ;
data.sekat(6).offset(:,1)+114 data.sekat(6).offset(:,2:4) ;
data.sekat(7).offset(:,1)+114+110 data.sekat(7).offset(:,2:4)]

data.tank(5).panel = [allPanel(523:612,1)-522 allPanel(523:612,2:6)-551 ; zzz(:,1)+
90 flipdim(zzz(:,2:6),2)+114 ; zzz(:,1)+ 90+90 zzz(:,2:6)+114+110 ]
for i = 1: length(data.tank.panel)
    te = ones(size(data.tank(i).panel,1),1)
    temp = [data.tank(i).panel te]
    data.tank(i).panel = [data.tank(i).panel te]
end
endfunction

```

Lampiran 2. Fungsi Program generateMeshJacket()

```

function [allOffset2, allPanel2]=generateMeshJacket(draw)
// clf
t = 10/1000
    allOffset2=[]; allPanel2=[];
    P0=[57.5 8 11.24]; P1=[0 8 11.24]; A =[0 360]; R = 1; N=[10 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0.16 6.1959];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); //kaki kiri atas

    P0=[57 -8 11.24]; P1=[0 -8 11.24]; A =[0 360]; R = 1; N=[10 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0.16 0.08];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); //kaki kanan atas

    P0=[56 8 1.24]; P1=[0 8 1.24]; A =[0 360]; R = 1; N=[10 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0 6.1959];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); //kaki kiri bawah

    P0=[56 -8 1.24]; P1=[0 -8 1.24]; A =[0 360]; R = 1; N=[10 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0 0.08];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); //kaki kanan bawah

    P0=[55 8 1.24]; P1=[55 8 11.24]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0 0.08 0];daxial = [0 0 0];[offset]=

```

```

P0=[55 8 1.24]; P1=[55 8 11.24]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0.08 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // antar kaki kiri vertikal

```

```

P0=[55 -8 1.24]; P1=[55 -8 11.24]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0.08 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // antar kaki kanan vertikal

```

```

P0=[55 -8 1.24]; P1=[55 8 1.24]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // antar kaki bawah horizontal

```

```

P0=[55.7 -8 11.24]; P1=[55.7 8 11.24]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-
1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // antar kaki atas horizontal

```

```

P0=[29 -10.36 15.84]; P1=[29 10.36 15.84]; A =[0 360]; R = 0.5; N=[4 8];
arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // antar kaki atas horizontal mid

```

```

P0=[28 -10.36 1.24]; P1=[28 10.36 1.24]; A =[0 360]; R = 0.5; N=[4 8];
arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // antar kaki bawah horizontal mid

```

```

P0=[28 10.36 1.24]; P1=[28 10.36 15.84]; A =[0 360]; R = 0.5; N=[4 8];
arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0.08 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // antar kaki kiri vertikan mid

```

```

P0=[28 -10.36 1.24]; P1=[28 -10.36 15.84]; A =[0 360]; R = 0.5; N=[4 8];
arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0.08 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // antar kaki kanan vertikan mid

```

```

P0=[3 -12 1.24]; P1=[3 12 1.24]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // antar kaki bawah horizontal ap

```

```

P0=[3 -12 1.24]; P1=[3 -12 19.74]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0.08 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // antar kaki kanan vertikln ap

```

```

P0=[3 12 1.24]; P1=[3 12 19.74]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0.08 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // antar kaki kiri vertikal ap

```

```

P0=[4.5 -12 19.74]; P1=[4.5 12 19.74]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-
1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 0 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // antar kaki bawah horizontal ap

```

```

P0=[55 8 1.24]; P1=[55 8 20.24]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 1 0.08 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // diagonal fp

```

```

P0=[55 -8 1.24]; P1=[55 -8 20.24]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ -1 0.08 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // diagonal fp

```

```

P0=[28 -10.36 1.24]; P1=[28 -10.36 27]; A =[0 360]; R = 0.5; N=[4 8];
arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ -0.97 0.08 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // diagonal mid

```

```

P0=[28 10.36 1.24]; P1=[28 10.36 27]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-
1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0.97 0.08 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // diagonal mid

```

```

P0=[3 12 1.24]; P1=[3 12 31.5]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0.935 0.08 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // diagonal ap

```

```

P0=[3 -12 1.24]; P1=[3 -12 31.5]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ -0.935 0.08 0];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // diagonal ap

```

```

P0=[55 -8 1.24]; P1=[55 -8 30]; A =[0 360]; R = 0.5; N=[4 8]; arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];
drotasi = [ 0 -1.08 0.08];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // diagonal kiri fp mid

```

```

P0=[59 10.36 1.24]; P1=[28 10.26 1.24]; A =[0 360]; R = 0.5; N=[4 8];
arahPanel=-1;
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P1];
drotasi = [ 0 -0.35 -0.08];daxial = [0 0 0];[offset]=
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(
allOffset2,allPanel2,offset,panel,t); // diagonal kanan fp mid

```

```
P0=[28 10.36 1.24]; P1=[-4.5 10.36 1.24]; A =[0 360]; R = 0.5; N=[4 8];  
arahPanel=-1;  
[offset,panel,idx,k] = meshPipeOffset(P0,P1,A,R,N,arahPanel,draw);crotasi = [P0];  
drotasi = [ 0 0 0.73];daxial = [0 0 0];[offset]=  
geotransformation(offset,crotasi,drotasi,daxial);[allOffset2,allPanel2]=arrangeData(  
allOffset2,allPanel2,offset,panel,t); // diagonal bawah mid ap  
endfunction
```

Lampiran 3. Fungsi Program buoyancy()

```

function [FF, MM, CC]=bouyancy(allOffset, allPanel, Cr, rho, pilihan)
//[FF,MM,CC,C,ac,hf]
//rho:[rho_air rho_pelat] // rho air = 1.025 T/m3 ; rho pelat = 8.75 T/m3
// Cr adalah titik referensi; Cr = [0 0 0]

m=size(allPanel,1);
n=size(allOffset,1);
allOffset(:,2:4)= allOffset(:,2:4);
P1=allOffset(allPanel(:,2),2:4); P2=allOffset(allPanel(:,3),2:4);
P3=allOffset(allPanel(:,4),2:4); P4=allOffset(allPanel(:,5),2:4);
t=allPanel(:,7); // t adalah ketebalan tiap panel
ac=cross(P2'-P1',P4'-P1'); // ac adalah luasan tiap panel disetiap sumbu
hf = (P1+P2+P3+P4)/4;
C = hf - repmat(Cr,m,1); // C adalah titik pusat panel

switch pilihan
case 'b'
check = hf(:,3)>=0;
for(i=1:m),
if(check(i)),
[acc,hfc] = interpolasi(i)
ac(i,:) = [acc];
hf(i,:) = [hfc];
end
Fb(i,:) = rho(1) * ac(i,:) * hf(i,3);
Mb(i,:) = ac(i,3) * C(i,:);
end
CC = sum(Mb,1)./sum(repmat(ac(:,3),1,3),1); // ac(:,3) sudah pasti minus
FF = sum(Fb,1);
MM = sum(Mb,1);
case 'w'
//perhitungan berat//

```



```

//perhitungan berat//
for(i=1:m),
    Fw(i,1) = t(i) * sqrt(sum(ac(i,:).^2)) * rho(2);
    Mw(i,:) = Fw(i,1) * C(i,:);
end
CC = sum(Mw,1)./sum(Fw);// titik berat terhadap x,y,z
FF = sum(Fw,1);
MM = sum(Mw,1);
case 'a'
//perhitungan bouyancy//
check = hf(:,3)>=0;
acw = ac
for(i=1:m),
    if(check(i)),
        ac(i,:) = [0 0 0];
    end
    Fb(i,:) = rho(1) * ac(i,:) * hf(i,3);
    Mb(i,:) = ac(i,3) * C(i,:);
end
Cb = sum(Mb,1)./sum(repmat(ac(:,3),1,3),1);
//perhitungan berat//
for(i=1:m),
    Fw(i,1) = t(i) * sqrt(sum(acw(i,:).^2)) * rho(2);
    Mw(i,:) = Fw(i,1) * C(i,:);
end
Cg = sum(Mw,1)./sum(Fw);// titik berat terhadap x,y,z
CC = [Cb; Cg];
FF = [sum(Fb,1);0 0 sum(Fw,1)];    MM = [sum(Mb,1); sum(Mw,1)];
end
endfunction

```

Lampiran 4. Fungsi Program meshPipeOffset()

```
function [offset, panel, idx, k]=meshPipeOffset(P0, P1, A, R, N, arahPanel, draw)
    A = A*pi/180;
    dA = A(1):(A(2)-A(1))/N(2):A(2);
    if(P1(1)~=P0(1))
        dx = (P1(1)-P0(1))/N(1);
        x = P0(1):dx:P1(1);
        y = P0(2) - R * cos(dA);
        z = P0(3) + R * sin(dA);
        m = length(x);           // jumlah data slice
        q = length(y);           // jumlah offset dalam slice
    elseif(P1(2)~=P0(2))
        dy = (P1(2)-P0(2))/N(1);
        y = P0(2):dy:P1(2);
        z = P0(3) + R * sin(dA);
        x = P0(1) - R * cos(dA);
        m = length(y);           // jumlah data slice
        q = length(z);           // jumlah offset dalam slice
    elseif(P1(3)~=P0(3))
        dz = (P1(3)-P0(3))/N(1);
        z = P0(3):dz:P1(3);
        x = R * cos(dA) + P0(1);
        y = R * sin(dA) + P0(2);
        m = length(z);           // jumlah data slice
        q = length(y);           // jumlah offset dalam slice
    end
    offset = [];
    panel = [];
    n = 1;
    k=1;
```

```

idx=0;
idxf=idx;
for i=1:m           // jumlah slice
    idx = idx(n)+1:idx(n)+q;
    // [offset] = offsetArrange(P0,P1,offset,idx,x,y,z,i);
    if(P1(3)~=P0(3))
        offset = [offset; idx' x' y' ones(q,1)*z(i)];
    elseif (P1(1)~=P0(1))
        offset = [offset; idx' ones(q,1)*x(i) y' z'];
    else
        offset = [offset; idx' x' ones(q,1)*y(i) z'];
    end
    idx = idx(q);
    p = idx-q;
    if(i > 1)
        for j = 1:q-1;   // jumlah panel
            k1 = p+1; k2 = k1+1; k3 = k2-q; k4 = k3-1;
            if (arahPanel== -1)
                // panel = [panel; k k1 k2 k3 k4 k1];
                panel = [panel; k k2 k1 k4 k3 k2];
            else
                panel = [panel; k k1 k2 k3 k4 k1]
            end
            k=k+1;
            p = k1;
        end
    end
    n = length(idx);   // jumlah nomor indekx
end
idx=idx+1;
if (draw==1) then
end
endfunction

```

Lampiran 5. Fungsi Program geotransformation()

```
function [offset]=geotransformation(offset, crotasi, drotasi, daxial)
// daxial ==> [dx dy dz] --> translasi pada sumbu ordinat
// drotasi ==> [Rx Ry Rz] --> Rotasi pada sumbu ordinat
alpha = drotasi(1); // Rx
betha = drotasi(2); // Ry
cetha = drotasi(3); // Rz
T1 = [1      0      0;
      0 cos(alpha) -sin(alpha);
      0 sin(alpha) cos(alpha)];

T2 = [cos(betha) 0 sin(betha);
      0      1      0 ;
      -sin(betha) 0 cos(betha)];

T3 = [cos(cetha) -sin(cetha) 0;
      sin(cetha) cos(cetha) 0;
      0      0      1];
T = T3 * T2 * T1;
for i=1:size(offset,1)
    temp = offset(i,2:4)' - crotasi'; // ambil ofset i simpan sementara pada
temp
    temp = T * temp; // transformasi temp menjadi nilai temp yang
baru
    offset(i,:) = [i temp'+daxial+crotasi]; // simpan nilai temp ke offset i
end
endfunction
```

Lampiran 6. Fungsi Program plotMesh()

```
function plotMesh(offset, panel)
    //h=figure(1);
    //xyz=[];
    cX=[]; cF=[];
    for i=1:size(panel,1)
        xyz=offset(panel(i,2:6)',2:4);
        plot3d(xyz(:,1),xyz(:,2),xyz(:,3));
        cX = mean(xyz(1:4,:),1);
        cA = cX-offset(panel(i,2),2:4);
        cB = cX-offset(panel(i,3),2:4);
        cN = cross(cA,cB);
        cF = cN./(sqrt(sum(cN'^2)))+cX;
        //xarrows([cX(1) cF(1)],[cX(2) cF(2)],[cX(3) cF(3)],-1,1);
    end
endfunction
```

Lampiran 7. Fungsi Program arrangeData()

```
function [allOffset, allPanel]=arrangeData(allOffset, allPanel, offset, panel, t)
    if (isempty(allOffset)) then
        idx=0; k=0;
    else
        idx = allOffset(size(allOffset,1),1);
        k = allPanel(size(allPanel,1),1);
    end
    te = ones(size(panel,1),1)*t
    offset(:,1) = offset(:,1)+idx;
    panel(:,1) = panel(:,1)+k;
    panel(:,2:6) = panel(:,2:6)+idx;
    allOffset = [allOffset; offset];
    allPanel = [allPanel; panel te];
endfunction
```

Lampiran 8. Fungsi Program interpolasi()

```
function [acc, hfc]=interpolasi(i)
    t1=allOffset(allPanel(i,2),2:4); t2=allOffset(allPanel(i,3),2:4);
    t3=allOffset(allPanel(i,4),2:4); t4=allOffset(allPanel(i,5),2:4);
    if t1(1,3)<0 || t2(1,3)<0 || t3(1,3)<0 ||t4(1,3)<0 then
        x = 0;  x1 = t1(1,3);  x2 = t2(1,3);  y1 = t1(1,2);  y2 = t2(1,2)
        if x2==x1 then
            y = (y1+y2)/2
        else
            y = (((x - x1)/(x2 - x1))*(y2 - y1))+y1
        end
        if t1(1,1)==t2(1,1) then
            if t1(1,3)<t2(1,3) then
                t2(1,2) = y
                t2(1,3) = 0
                t3(1,2) = y
                t3(1,3) = 0
            else
                t1(1,2) = y
                t1(1,3) = 0
                t4(1,2) = y
                t4(1,3) = 0
            end
        end
    end
    acc =cross(t2'-t1',t4'-t1')
    hfc = (t1+t2+t3+t4)/4
else
    acc = [0 0 0]
    hfc = (t1+t2+t3+t4)/4
end
endfunction
```

Lampiran 9. Fungsi Program run()

```

function [allOffset3, result, db]=run(r)
    // n = step
    // Lj = slide jacket
    dl = 1
    while dl > 0.001 || dl <-0.001
        [data,allOffset,allPanel]=genof(x)
        [allOffset2,allPanel2] = generateMeshJacket(1)
        allOffset2(:,4) = allOffset2(:,4)-1.24+max(allOffset(:,4))+1
        Cr = [0 0 0];rho = [1.025 7.85]
        [FFb,MMb,CCb]=bouyancy(allOffset,allPanel,Cr,rho,'b')

        crotasi = [CCb]; drotasi = [0 0 0]; daxial=[stp(step,1) 0 0]
        [allOffset2]= geotransformation(allOffset2,crotasi,drotasi,daxial)
        //deg = 3 // derajat
        rad = -deg*(%pi/180)
        crotasi = [CCb]; drotasi = [0 rad 0]; daxial=[0 0 0]
        [allOffset]= geotransformation(allOffset,crotasi,drotasi,daxial)
        [allOffset2]= geotransformation(allOffset2,crotasi,drotasi,daxial)
        [FFj,MMj,CCj]=bouyancy(allOffset2,allPanel2,Cr,rho,'w')
        Mj = (CCb(1,1)-CCj(1,1))*FFj
        for i = 1:5
            [data.tank(i).offset]= geotransformation(data.tank(i).offset,crotasi,drotasi,daxial)
            min2 = min(data.tank(i).offset(:,4))
            data.tank(i).offset = [data.tank(i).offset(:,1:3) data.tank(i).offset(:,4)-min2]
        end
        if CCb(1,1)<=(data.tank(1).offset(1,2)+data.tank(1).offset(334,2))/2 &&
        CCb(1,1)>data.tank(1).offset(1,2) then
            i = 1
        elseif CCb(1,1)<= (data.tank(2).offset(353,2)+data.tank(2).offset(1,2))/2 &&
        CCb(1,1)>(data.tank(1).offset(1,2)+data.tank(1).offset(334,2))/2 then
    
```



```

i = 2
elseif CCb(1,1)<=(data.tank(3).offset(353,2)+data.tank(3).offset(1,2))/2 &&
CCb(1,1)>(data.tank(2).offset(353,2)+data.tank(2).offset(1,2))/2 then
    i = 3
elseif CCb(1,1)<=(data.tank(4).offset(353,2)+data.tank(4).offset(1,2))/2 &&
CCb(1,1)>(data.tank(3).offset(353,2)+data.tank(3).offset(1,2))/2 then
    i = 4
elseif CCb(1,1) <=(data.tank(5).offset(353,2)+data.tank(5).offset(1,2))/2 &&
CCb(1,1)>(data.tank(4).offset(353,2)+data.tank(4).offset(1,2))/2 then
    i = 5
end

W = FFj
db = 2 // level di tangki 1 2
for j = 2:i-1
    if db<=0 then continue end
    oft = [data.tank(j).offset(:,1:3) data.tank(j).offset(:,4)-db]
    [FFt,MMt,CCt]=bouyancy(oft,data.tank(j).panel,Cr,rho,'b')
    Mj = Mj + (CCb(1,1)-CCt(1,1))*FFt(1,3)
    W = W +FFt(1,3)
end
Mf = Mj/length(i:5)
ZM = []
ZM2 = Mj
result= []
//W = FFj ini yang kasi pusing
for k = i:5
    Mt = 0
    dt = 0
    while Mf-Mt>0.01

```

```

dt = dt + 0.01
oft = [data.tank(k).offset(:,1:3) data.tank(k).offset(:,4)-dt]
[FFt,MMt,CCt]=bouyancy(oft,data.tank(k).panel,Cr,rho,'b')
Mt = (CCb(1,1)-CCt(1,1))*-FFt(1,3)
if FFt(1,3)/1.025>maxvol(k,1)-100 then break end
disp([Mf-Mt])
end
dt = dt - 0.01
oft = [data.tank(k).offset(:,1:3) data.tank(k).offset(:,4)-dt]
[FFt,MMt,CCt]=bouyancy(oft,data.tank(k).panel,Cr,rho,'b')
Mt = (CCb(1,1)-CCt(1,1))*-FFt(1,3)
while Mf-Mt>0.001
dt = dt + 0.001
oft = [data.tank(k).offset(:,1:3) data.tank(k).offset(:,4)-dt]
[FFt,MMt,CCt]=bouyancy(oft,data.tank(k).panel,Cr,rho,'b')
Mt = (CCb(1,1)-CCt(1,1))*-FFt(1,3)
if FFt(1,3)/1.025>maxvol(k,1)-100 then break end
disp([Mf-Mt])
end
dt = dt - 0.001
oft = [data.tank(k).offset(:,1:3) data.tank(k).offset(:,4)-dt]
[FFt,MMt,CCt]=bouyancy(oft,data.tank(k).panel,Cr,rho,'b')
Mt = (CCb(1,1)-CCt(1,1))*-FFt(1,3)
while Mf-Mt>0.00001
dt = dt + 0.0001
oft = [data.tank(k).offset(:,1:3) data.tank(k).offset(:,4)-dt]
[FFt,MMt,CCt]=bouyancy(oft,data.tank(k).panel,Cr,rho,'b')
Mt = (CCb(1,1)-CCt(1,1))*-FFt(1,3)
if FFt(1,3)/1.025>maxvol(k,1)-100 then break end
disp([Mf-Mt])

```

```

end

    draft2 = draft2 - 0.1
    oft = [allOffset(:,1:3) allOffset(:,4)+draft-draft2]
    [FFb,MMb,CCb]=bouyancy(oft,allPanel,Cr,rho,'b')
    disp(W - FFb(1,3))
while W - FFb(1,3) > 1
    draft2 = draft2 + 0.01
    oft = [allOffset(:,1:3) allOffset(:,4)+draft-draft2]
    [FFb,MMb,CCb]=bouyancy(oft,allPanel,Cr,rho,'b')
    disp(W - FFb(1,3))
end

result = [result draft2 ZM2]
dl = ZM2/W
del1 = draft
del2 = draft2
draft = draft2

result = [result dl]
//messagebox(['level tank3 = '; 'level tank 2 = '; 'level tank1 = '; 'displacement = ' ;
'draft = '; 'sigma momen = '; 'koreksi jarak CG = '] + [string(result)])
end
//clf
del = del1-del2

    crotasi = [CCb]; drotasi = [0 rad 0]; daxial=[0 0 del]
    [allOffset3]= geotransformation(allOffset,crotasi,drotasi,daxial)
    [allOffset4]= geotransformation(allOffset2,crotasi,drotasi,daxial)
//plotMesh(allOffset3,allPanel)
if step == 1 || step==n+1 then
    plotMesh(allOffset4,allPanel2)
end

endfunction

```

Lampiran 10. Fungsi Program plotlevel()

```

function plotlevel(result, db)
    figure(); global deg
    newaxes();handles.ax_1.margins = [ 0 0 0 0];handles.ax_1.axes_bounds =
    [0.5,0.15,0.5,0.7];handles.ax_1.auto_scale = "on";handles.ax_1.data_bounds = [-40 -
    20 -5; 80 20 30];handles.ax_1.line_mode = "on";handles.ax_1.line_style =
    1;handles.ax_1.mark_size = 5
    for IRL = 1:size(Result,1)
        warna =["r" "g" "b" "c" "m" "y" "k"]
    result = Result(IRL,:)
    x = read('offsetbarga2.txt',380,4)
    draft = 0
    [data,allOffset,allPanel]=genof(x)
    p=[]
    for g = 1: length(data.station.offset)
        p = [p; data.station(g).offset(1,:)]
    end
    p =
    [p;data.station(38).offset(10,:);data.station(1).offset(10,:);data.station(1).offset(1,:)]
    p1 = [-3 3;70 3]
    s1 = [data.station(7).offset(1,:);data.station(7).offset(10,:)]
    s2 = [data.station(12).offset(1,:);data.station(12).offset(10,:)]
    s3 = [data.station(18).offset(1,:);data.station(18).offset(10,:)]
    s4 = [data.station(24).offset(1,:);data.station(24).offset(10,:)]
    s5 = [data.station(30).offset(1,:);data.station(30).offset(10,:)]
    s6 = [data.station(35).offset(1,:);data.station(35).offset(10,:)]
    plot2d(p(:,1),p(:,3),frameflag=3)
    title("Water Level at Step " + string(IRL-1) , "fontsize",3)
    plot(s1(:,1),s1(:,3),"k")
    plot(s2(:,1),s2(:,3),"k")
    plot(s3(:,1),s3(:,3),"k")
    nlot(s4(:,1) s4(:,3) "k")

```

```

plot(s4(:,1),s4(:,3),"k")
plot(s5(:,1),s5(:,3),"k")
plot(s6(:,1),s6(:,3),"k")
sv=[]
dt = result(1,3)//tank no.5
deg = 2//strtod(handles.ed_2.string)
rad = -deg*(%pi/180)
sa = cos(rad)*dt
de = tan(rad)*(data.station(35).offset(1,1)-data.station(30).offset(1,1))
lk = sa-de
p5=[data.station(30).offset(1,1) lk; data.station(35).offset(1,1) sa]
plot(p5(:,1),p5(:,2),(warna(IRL)))
sv(5,:)= [lk sa]

dt = result(1,2)//tank no.4
rad = -deg*(%pi/180)
sa = cos(rad)*dt
de = tan(rad)*(data.station(30).offset(1,1)-data.station(24).offset(1,1))
lk = sa-de
p4=[data.station(24).offset(1,1) lk; data.station(30).offset(1,1) sa]
plot(p4(:,1),p4(:,2),(warna(IRL)))
sv(4,:)= [lk sa]

dt = result(1,1)//tank no.3
rad = -deg*(%pi/180)
sa = cos(rad)*dt
de = tan(rad)*(data.station(24).offset(1,1)-data.station(18).offset(1,1))
lk = sa-de
p3=[data.station(18).offset(1,1) lk; data.station(24).offset(1,1) sa]
plot(p3(:,1),p3(:,2),(warna(IRL)))

```

```

p3 =[data.station(18).offset(1,1) lk; data.station(24).offset(1,1) sa]
plot(p3(:,1),p3(:,2),(warna(IRL)))
sv(3,:)= [lk sa]

dt = db
rad = -deg*(%pi/180)
sa = cos(rad)*dt
de = tan(rad)*(data.station(18).offset(1,1)-data.station(12).offset(1,1))
lk = sa-de
p2 =[data.station(12).offset(1,1) lk; data.station(18).offset(1,1) sa]
plot(p2(:,1),p2(:,2),(warna(IRL)))
sv(2,:)= [lk sa]

dt = db
rad = -deg*(%pi/180)
sa = cos(rad)*dt
de = tan(rad)*(data.station(12).offset(1,1)-data.station(7).offset(1,1))
lk = sa-de
p1 =[data.station(7).offset(1,1) lk; data.station(12).offset(1,1) sa]
//plot(p1(:,1),p1(:,2))
sv(1,:)= [0 0]
disp(IRL-1)
disp(sv)
end
endfunction

```

Lampiran 11.Fungsi Program postLaunching()

```

function postLaunching(inpost)
    global deg
    Wpost = sum(inpost)
    draft = 0
    Wb = 0
    dpost = 0
    [data,allOffset,allPanel]=genof(x)
    while Wpost-Wb >100
        crotasi = [0 0 0]; drotasi = [0 0 0]; daxial=[0 0 -0.1]
        [allOffset]= geotransformation(allOffset,crotasi,drotasi,daxial)
        Cr = [0 0 0];rho = [1.025 7.85]
        [FFb,MMb,CCb]=bouyancy(allOffset,allPanel,Cr,rho,'b')
        dpost = dpost-0.1
        Wb = FFb(1,3)
        disp(Wpost-Wb)
    end
    crotasi = [0 0 0]; drotasi = [0 0 0]; daxial=[0 0 0.1]
    [allOffset]= geotransformation(allOffset,crotasi,drotasi,daxial)
    Cr = [0 0 0];rho = [1.025 7.85]
    [FFb,MMb,CCb]=bouyancy(allOffset,allPanel,Cr,rho,'b')
    dpost = dpost-0.01
    Wb = FFb(1,3)
    disp(Wpost-Wb)
    while Wpost-Wb >10
        crotasi = [0 0 0]; drotasi = [0 0 0]; daxial=[0 0 -0.01]
        [allOffset]= geotransformation(allOffset,crotasi,drotasi,daxial)
        Cr = [0 0 0];rho = [1.025 7.85]
        [FFb,MMb,CCb]=bouyancy(allOffset,allPanel,Cr,rho,'b')
        dpost = dpost-0.01
        Wb = FFb(1,3)
        disp(Wpost-Wb)
    end
    crotasi = [0 0 0]; drotasi = [0 0 0]; daxial=[0 0 0.01]
    [allOffset]= geotransformation(allOffset,crotasi,drotasi,daxial)
    Cr = [0 0 0];rho = [1.025 7.85]
    [FFb,MMb,CCb]=bouyancy(allOffset,allPanel,Cr,rho,'b')
    dpost = dpost-0.01
    Wb = FFb(1,3)
    disp(Wpost-Wb)
    while Wpost-Wb >0
        crotasi = [0 0 0]; drotasi = [0 0 0]; daxial=[0 0 -0.001]
        [allOffset]= geotransformation(allOffset,crotasi,drotasi,daxial)
        Cr = [0 0 0];rho = [1.025 7.85]
        [FFb,MMb,CCb]=bouyancy(allOffset,allPanel,Cr,rho,'b')
        dpost = dpost-0.01
        Wb = FFb(1,3)
        disp(Wpost-Wb)
    end
    disp('alihalihalihalihalihalihalihalihalihalihalihalihalihalihalihalihalihalih')
    disp(dpost)
    ZMP = (CCb(1,1)-15)*inpost(1,1)+(CCb(1,1)-25.828)*inpost(2,1)+(CCb(1,1)-36.898)*inpost(3,1)+(CCb(1,1)-
    47.967)*inpost(4,1)+(CCb(1,1)-59.036)*inpost(5,1)
    dg = 0
    while ZMP<0
        crotasi = [CCb]; drotasi = [0 0.1*%pi/180 0]; daxial=[0 0 0]
        [allOffset]= geotransformation(allOffset,crotasi,drotasi,daxial)
        [FFb,MMb,CCb]=bouyancy(allOffset,allPanel,Cr,rho,'b')
        ZMP = (CCb(1,1)-15*cos(dg)*inpost(1,1)+(CCb(1,1)-25.828*cos(dg))*inpost(2,1)+(CCb(1,1)-
        36.898*cos(dg))*inpost(3,1)+(CCb(1,1)-47.967*cos(dg))*inpost(4,1)+(CCb(1,1)-59.036*cos(dg))*inpost(5,1))
        dg = dg +(0.1*%pi/180)
        disp(ZMP)
    end
    Wb = FFb(1,3)
    dz = 0

```

```

dz = 0
while Wpost-Wb >1 ||Wpost-Wb <-1
    if Wpost-Wb >5 then dz = -0.0001 end
    if Wpost-Wb <5 then dz = 0.0001 end
    crotasi = [0 0 0]; drotasi = [0 0 0]; daxial=[0 0 dz]/-0.001]
    [allOffset]= geotransformation(allOffset,crotasi,drotasi,daxial)
    Cr = [0 0 0];rho = [1.025 7.85]
    [FFb,MMb,CCb]=bouyancy(allOffset,allPanel,Cr,rho,'b')
    dpost = dpost-0.01
    Wb = FFb(1,3)
    disp(Wpost-Wb)
end
dg2 = dg*180/%pi
disp(dg2)
disp(Wpost-FFb(1,3))
APp = allOffset(124,4)
FPp = allOffset(656,4)
disp([APp FPp])
figure()
newaxes()
plotMesh(allOffset,allPanel)
a = [-40 -25 0; -40 25 0; 80 25 0; 80 -25 0; -40 -25 0]
plot3d(a(:,1),a(:,2),a(:,3))
endfunction

```


Lampiran 12. Program *Graphical User Interface* (GUI)

```

//////////
f=figure('figure_position',[0,0],'figure_size',[1280,720],'auto_resize','on','background',[-2],'figure_name','Skripsi
ver.1','dockable','off','infobar_visible','off','toolbar_visible','off','menubar_visible','off','default_axes','on','visible','off');
//////////
handles.dummy = 0;
handles.img4=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','on','FontAngle','normal','FontName','Tahoma','FontSize',[12],'FontUnits','points','FontWeight','normal','Foreg
roundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[0],'Max',[1],'Min',[0],'Position',[0.45,0,0.6,0.12],'Relief','default','SliderStep',[
0.01,0.1],'String','E:\ZKRIPZI\Skripsi\ROV SciLab-20220108T071654Z-001\ROV
SciLab\backgroundtop.jpg','Style','image','Value',[1,1,0,0,0],'VerticalAlignment','middle','Visible','on','Tag','img1','Callba
ck','img1_callback(handles)')
handles.img3=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','on','FontAngle','normal','FontName','Tahoma','FontSize',[12],'FontUnits','points','FontWeight','normal','Foreg
roundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[0],'Max',[1],'Min',[0],'Position',[0.45,0.86,0.6,0.14],'Relief','default','SliderSte
p',[0.01,0.1],'String','E:\ZKRIPZI\Skripsi\ROV SciLab-20220108T071654Z-001\ROV
SciLab\backgroundtop.jpg','Style','image','Value',[1,1,0,0,0],'VerticalAlignment','middle','Visible','on','Tag','img1','Callba
ck','img1_callback(handles)')
handles.img2=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','on','FontAngle','normal','FontName','Tahoma','FontSize',[12],'FontUnits','points','FontWeight','normal','Foreg
roundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[0],'Max',[1],'Min',[0],'Position',[0,0,0.47,1],'Relief','default','SliderStep',[0.01,
0.1],'String','E:\ZKRIPZI\Skripsi\ROV SciLab-20220108T071654Z-001\ROV
SciLab\backgroundleft.jpg','Style','image','Value',[1,1,0,0,0],'VerticalAlignment','middle','Visible','on','Tag','img1','Callba
ck','img1_callback(handles)')
handles.imgline=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','on','FontAngle','normal','FontName','Tahoma','FontSize',[12],'FontUnits','points','FontWeight','normal','Foreg
roundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[0],'Max',[1],'Min',[0],'Position',[0.47,0,0.006,1],'Relief','default','SliderStep',[
0.01,0.1],'String','E:\ZKRIPZI\Skripsi\ROV SciLab-20220108T071654Z-001\ROV
SciLab\line.jpg','Style','image','Value',[1,1,0,0,0],'VerticalAlignment','middle','Visible','on','Tag','img1','Callback','img1_c
allback(handles)')
handles.imgline1=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','on','FontAngle','normal','FontName','Tahoma','FontSize',[12],'FontUnits','points','FontWeight','normal','Foreg
roundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[0],'Max',[1],'Min',[0],'Position',[0.47,0.86,1,0.01],'Relief','default','SliderStep',
[0.01,0.1],'String','E:\ZKRIPZI\Skripsi\ROV SciLab-20220108T071654Z-001\ROV
SciLab\line1.jpg','Style','image','Value',[1,1,0,0,0],'VerticalAlignment','middle','Visible','on','Tag','img1','Callback','img1
_callback(handles)')
handles.imgline2=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','on','FontAngle','normal','FontName','Tahoma','FontSize',[12],'FontUnits','points','FontWeight','normal','Foreg
roundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[0],'Max',[1],'Min',[0],'Position',[0.47,0.12,1,0.01],'Relief','default','SliderStep',
[0.01,0.1],'String','E:\ZKRIPZI\Skripsi\ROV SciLab-20220108T071654Z-001\ROV
SciLab\line1.jpg','Style','image','Value',[1,1,0,0,0],'VerticalAlignment','middle','Visible','on','Tag','img1','Callback','img1
_callback(handles)')
handles.frame1_input=uicontrol(f,'unit','normalized','BackgroundColor',[1,1,1],'Enable','on','FontAngle','normal','FontNa
me','Tahoma','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[0],'Max',[1],'Min',[0],'Position',[0.02,0.7,0.2,0.2],'Relief','default','SliderStep',
[0.01,0.1],'String','UnName2','Style','frame','Value',[0],'VerticalAlignment','middle','Visible','on','Tag','frame1_input','Cal
lback','','constraints','createConstraints('gridbag',[1,2,1,1],[0,0],'both','center'),'border','createBorder('titled',
'createBorder('line','Gray',1.5),'_('Input'),'center','top','createBorderFont('Times New Roman',12,'normal'))')
handles.frame2_output=uicontrol(f,'unit','normalized','BackgroundColor',[1,1,1],'Enable','on','FontAngle','normal','FontN
ame','Tahoma','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[0],'Max',[1],'Min',[0],'Position',[0.02,0.03,0.2,0.63],'Relief','default','SliderSte
p',[0.01,0.1],'String','UnName2','Style','frame','Value',[0],'VerticalAlignment','middle','Visible','on','Tag','frame2_output',
'Callback','','constraints','createConstraints('gridbag',[1,2,1,1],[0,0],'both','center'),'border','createBorder('titled',
'createBorder('line','Gray',1.5),'_('Output'),'center','top','createBorderFont('Times New Roman',12,'normal'))')
handles.frame3_jacket=uicontrol(f,'unit','normalized','BackgroundColor',[1,1,1],'Enable','on','FontAngle','normal','FontN
ame','Tahoma','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[0],'Max',[1],'Min',[0],'Position',[0.23,0.7,0.2,0.2],'Relief','default','SliderStep',
[0.01,0.1],'String','UnName2','Style','frame','Value',[0],'VerticalAlignment','middle','Visible','on','Tag','frame1_input','Cal
lback','','constraints','createConstraints('gridbag',[1,2,1,1],[0,0],'both','center'),'border','createBorder('titled',

```

```

createBorder('line', 'Gray', 1.5),_(('Jacket'), 'center', 'top',createBorderFont ("Times New Roman",12,'normal')))
handles.frame4_table=uicontrol(f,'unit','normalized','BackgroundColor',[1,1,1],'Enable','on','FontAngle','normal','FontName',
'Tahoma','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[1],'Max',[1],'Min',[0],'Position',[0.23,0.25,0.24,0.41],'Relief','default','SliderSt
ep',[0.01,0.1],'String','UnName2','Style','frame','Value',[0],'VerticalAlignment','middle','Visible','on','Tag','frame2_output
','Callback','', 'constraints',createConstraints('gridbag', [1, 2, 1, 1], [0, 0], 'both', 'center'),'border',createBorder('titled',
createBorder('line', 'Gray', 1.5),_(('Recap'), 'center', 'top',createBorderFont ("Times New Roman",12,'normal')))
handles.pb_plot=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','on','FontAngle','normal','FontName','Times New
Roman','FontSize',[20],'FontUnits','points','FontWeight','bold','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','center','ListboxTop',[1],'Max',[1],'Min',[0],'Position',[0.24,0.13,0.1778846,0.0863636],'Relief','d
efault','SliderStep',[0.01,0.1],'String','PLOT','Style','pushbutton','Value',[0],'VerticalAlignment','middle','Visible','on','Tag
','pb_plot','Callback','pb_plot_callback(handles)')
handles.ax_1=newaxes();handles.ax_1.margins = [ 0 0 0 0];handles.ax_1.axes_bounds =
[0.5,0.15,0.5,0.7];handles.ax_1.auto_scale = "off";handles.ax_1.data_bounds = [-40 -20 -5; 80 20
30];handles.ax_1.line_mode = "on";handles.ax_1.line_style = 1;handles.ax_1.mark_size = 5
handles.ed_1=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','on','FontAngle','normal','FontName','Times New
Roman','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[1],'Max',[1],'Min',[0],'Position',[0.12,0.8,0.07,0.04],'Relief','default','SliderSte
p',[0.01,0.1],'String','','Style','edit','Value',[0],'VerticalAlignment','middle','Visible','on','Tag','ed_1','Callback','')
handles.ed_2=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','on','FontAngle','normal','FontName','Times New
Roman','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[1],'Max',[1],'Min',[0],'Position',[0.12,0.73,0.07,0.04],'Relief','default','SliderSt
ep',[0.01,0.1],'String','','Style','edit','Value',[0],'VerticalAlignment','middle','Visible','on','Tag','ed_2','Callback','')
handles.ed_CBx=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','off','FontAngle','normal','FontName','Times New
Roman','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[1],'Max',[1],'Min',[0],'Position',[0.12,0.58,0.07,0.04],'Relief','default','SliderSt
ep',[0.01,0.1],'String','','Style','edit','Value',[0],'VerticalAlignment','middle','Visible','on','Tag','ed_1','Callback','')
handles.ed_CBz=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','off','FontAngle','normal','FontName','Times New
Roman','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[1],'Max',[1],'Min',[0],'Position',[0.12,0.48,0.07,0.04],'Relief','default','SliderSt
ep',[0.01,0.1],'String','','Style','edit','Value',[0],'VerticalAlignment','middle','Visible','on','Tag','ed_1','Callback','')
handles.ed_displacement=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','off','FontAngle','normal','FontName','Times New
Roman','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[1],'Max',[1],'Min',[0],'Position',[0.12,0.41,0.07,0.04],'Relief','default','SliderSt
ep',[0.01,0.1],'String','','Style','edit','Value',[0],'VerticalAlignment','middle','Visible','on','Tag','ed_1','Callback','')
handles.ed_voltank1=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','off','FontAngle','normal','FontName','Times New
Roman','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[1],'Max',[1],'Min',[0],'Position',[0.12,0.34,0.07,0.04],'Relief','default','SliderSt
ep',[0.01,0.1],'String','','Style','edit','Value',[0],'VerticalAlignment','middle','Visible','on','Tag','ed_1','Callback','')
handles.ed_voltank2=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','off','FontAngle','normal','FontName','Times New
Roman','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[1],'Max',[1],'Min',[0],'Position',[0.12,0.27,0.07,0.04],'Relief','default','SliderSt
ep',[0.01,0.1],'String','','Style','edit','Value',[0],'VerticalAlignment','middle','Visible','on','Tag','ed_1','Callback','')
handles.ed_voltank3=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','off','FontAngle','normal','FontName','Times New
Roman','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-
1],'HorizontalAlignment','left','ListboxTop',[1],'Max',[1],'Min',[0],'Position',[0.12,0.2,0.07,0.04],'Relief','default','SliderSte
p',[0.01,0.1],'String','','Style','edit','Value',[0],'VerticalAlignment','middle','Visible','on','Tag','ed_1','Callback','')
handles.ed_voltank4=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-
1],'Enable','off','FontAngle','normal','FontName','Times New
Roman','FontSize',[12],'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-

```

```

handles.ed_voltank4=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-1],
'Enable','off','FontAngle','normal','FontName','Times New Roman','FontSize',[12],
'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','left','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.12,0.13,0.07,0.04],'Relief','default','SliderStep',[0.01,0.1],
'String','','Style','edit','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','ed_1','Callback','')
handles.ed_voltank5=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-1],
'Enable','off','FontAngle','normal','FontName','Times New Roman','FontSize',[12],
'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','left','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.12,0.06,0.07,0.04],'Relief','default','SliderStep',[0.01,0.1],
'String','','Style','edit','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','ed_1','Callback','')
handles.ed_3=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-1],
'Enable','on','FontAngle','normal','FontName','Times New Roman','FontSize',[12],
'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','left','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.32,0.8,0.07,0.04],'Relief','default','SliderStep',[0.01,0.1],
'String','','Style','edit','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','ed_1','Callback','')
handles.ed_4=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-1],
'Enable','on','FontAngle','normal','FontName','Times New Roman','FontSize',[12],
'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','left','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.32,0.73,0.07,0.04],'Relief','default','SliderStep',[0.01,0.1],
'String','','Style','edit','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','ed_2','Callback','')
handles.pb_run=uicontrol(f,'unit','normalized','BackgroundColor',[-1,-1,-1],
'Enable','on','FontAngle','normal','FontName','Times New Roman','FontSize',[20],
'FontUnits','points','FontWeight','bold','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','center','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.24,0.03,0.1778846,0.0863636],'Relief','default','SliderStep',[0.01,0.1],
'String','RUN','Style','pushbutton','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','pb_run','Callback','pb_run_callback(handles)')
handles.txt_draft=uicontrol(f,'unit','normalized','BackgroundColor',[1,1,1],
'Enable','on','FontAngle','normal','FontName','Times New Roman','FontSize',[12],
'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','left','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.045,0.8,0.04,0.0341477],'Relief','default','SliderStep',[0.01,0.1],
'String','Draft','Style','text','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','txt_pidrudder','Callback','')
handles.txt_m=uicontrol(f,'unit','normalized','BackgroundColor',[1,1,1],
'Enable','on','FontAngle','normal','FontName','Times New Roman','FontSize',[12],
'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','left','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.19,0.81,0.01,0.02],'Relief','default','SliderStep',[0.01,0.1],
'String','m','Style','text','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','txt_pidrudder','Callback','')
handles.txt_trim=uicontrol(f,'unit','normalized','BackgroundColor',[1,1,1],
'Enable','on','FontAngle','normal','FontName','Times New Roman','FontSize',[12],
'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','left','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.045,0.73,0.04,0.0341477],'Relief','default','SliderStep',[0.01,0.1],
'String','Trim','Style','text','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','txt_pidrudder','Callback','')
handles.txt_deg=uicontrol(f,'unit','normalized','BackgroundColor',[1,1,1],
'Enable','on','FontAngle','normal','FontName','Times New Roman','FontSize',[12],
'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','left','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.19,0.74,0.016,0.021],'Relief','default','SliderStep',[0.01,0.1],
'String','deg','Style','text','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','txt_pidrudder','Callback','')
handles.txt_CB=uicontrol(f,'unit','normalized','BackgroundColor',[1,1,1],
'Enable','on','FontAngle','normal','FontName','Times New Roman','FontSize',[12],
'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','left','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.045,0.58,0.02,0.03],'Relief','default','SliderStep',[0.01,0.1],
'String','CB','Style','text','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','txt_pidrudder','Callback','')
handles.txt_CBx=uicontrol(f,'unit','normalized','BackgroundColor',[1,1,1],
'Enable','on','FontAngle','normal','FontName','Times New Roman','FontSize',[12],
'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','left','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.11,0.58,0.01,0.0341477],'Relief','default','SliderStep',[0.01,0.1],
'String','X','Style','text','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','txt_pidrudder','Callback','')
handles.txt_CBy=uicontrol(f,'unit','normalized','BackgroundColor',[1,1,1],
'Enable','on','FontAngle','normal','FontName','Times New Roman','FontSize',[12],
'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','left','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.11,0.53,0.01,0.0341477],'Relief','default','SliderStep',[0.01,0.1],
'String','Y','Style','text','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','txt_pidrudder','Callback','')
handles.txt_CBz=uicontrol(f,'unit','normalized','BackgroundColor',[1,1,1],
'Enable','on','FontAngle','normal','FontName','Times New Roman','FontSize',[12],
'FontUnits','points','FontWeight','normal','ForegroundColor',[-1,-1,-1],
'HorizontalAlignment','left','ListboxTop',[],'Max',[1],'Min',[0],
'Position',[0.11,0.48,0.01,0.0341477],'Relief','default','SliderStep',[0.01,0.1],
'String','Z','Style','text','Value',[0],'VerticalAlignment','middle','Visible','on',
'Tag','txt_pidrudder','Callback','')

```



```

isi = ["step1" string(FFb(1,3)) " " " " " " " " " " " "]
table = [parameter;isi]
handles.recap.string = table
end
endfunction
draft = 4 // untuk mencari maximum volume
[data,allOffset,allPanel]=genof(x)
for fm = 1:5
    Cr = [0 0 0];rho = [1.025 7.85]
    [FFmv,MMmv,CCmv]=bouyancy(data.tank(fm).offset,data.tank(fm).panel,Cr,rho,'b')
    maxvol(fm,1) = FFmv(1,3)/1.025
end
global deg
function pb_run_callback(handles)
global deg
//Write your callback for pb_run here
messagebox("Running , Please Wait")
delete(handles.ax_1.children); global deg
if handles.ed_3.string == " " || handles.ed_4.string == "then
    handles.ed_3.string == '0' || handles.ed_4.string == '0'
else
n = strtod(handles.ed_4.string)
Lj = strtod(handles.ed_3.string)
L = Lj/n
stp = -[0:L:Lj]'
isi = []
for step = 1:n+1
draft = strtod(handles.ed_1.string)
deg = strtod(handles.ed_2.string)
[allOffset3,result,db]= run(1)
[data,allOffset,allPanel]=genof(x)
    Cr = [0 0 0];rho = [1.025 7.85]
    [FFb,MMb,CCb]=bouyancy(allOffset,allPanel,Cr,rho,'b')
    rad = -deg*(%pi/180)
    crotasi = [CCb]; drotasi = [0 rad 0]; daxial=[0 0 0]

for i = 1:5
    [data.tank(i).offset]= geotransformation(data.tank(i).offset,crotasi,drotasi,daxial)
    min2 = min(data.tank(i).offset(:,4))
    data.tank(i).offset = [data.tank(i).offset(:,1:3) data.tank(i).offset(:,4)-min2]
end
dt = result(1,1)
oft = [data.tank(3).offset(:,1:3) data.tank(3).offset(:,4)-dt]
[FFt,MMt,CCt]=bouyancy(oft,data.tank(3).panel,Cr,rho,'b')
handles.ed_voltank3.string = [string(FFt(1,3)/1.025)]
voltank3(step)= FFt(1,3)/1.025
dt = result(1,2)
oft = [data.tank(4).offset(:,1:3) data.tank(4).offset(:,4)-dt]
[FFt,MMt,CCt]=bouyancy(oft,data.tank(4).panel,Cr,rho,'b')
handles.ed_voltank4.string = [string(FFt(1,3)/1.025)]
voltank4(step)= FFt(1,3)/1.025
dt = result(1,3)
oft = [data.tank(5).offset(:,1:3) data.tank(5).offset(:,4)-dt]
[FFt,MMt,CCt]=bouyancy(oft,data.tank(5).panel,Cr,rho,'b')
handles.ed_voltank5.string = [string(FFt(1,3)/1.025)]
voltank5(step)= FFt(1,3)/1.025
handles.ed_displacement.string = [string(result(1,4))]
displacement(step) = result(1,4)
dt = result(1,5)
oft = [data.tank(1).offset(:,1:3) data.tank(1).offset(:,4)-dt]
[FFt,MMt,CCt]=bouyancy(oft,data.tank(1).panel,Cr,rho,'b')
handles.ed_voltank1.string = [string(0.00)]
voltank1(step) = FFt(1,3)/1.025*0

```

```

[FFt,MMt,CCt]=bouyancy(oft,data.tank(2),panel,Cr,rho,'b')
handles.ed_voltank2.string = [string(FFt(1,3)/1.025)]
voltank2(step) = FFt(1,3)/1.025
a = [-40 -25 0; -40 25 0; 80 25 0; 80 -25 0; -40 -25 0]
plot3d(a(:,1),a(:,2),a(:,3))
Cr = [0 0 0];rho = [1.025 7.85]
[FFb,MMb,CCb]=bouyancy(allOffset3,allPanel,Cr,rho,'b')
handles.ed_CBx.string = [string(CCb(1,1))]
handles.ed_CBy.string = [string(CCb(1,2))]
handles.ed_CBz.string = [string(CCb(1,3))]
isi=[isi; "step"+string(step-1) string(displacement(step)) string(voltank1(step)) string(voltank2(step))
string(voltank3(step)) string(voltank4(step)) string(voltank5(step))]
table = [parameter;isi]
handles.recap.string = table
Result(step,:)=result
AP(step) = allOffset3(124,4)
FP(step) = allOffset3(656,4)
end
plotMesh(allOffset3,allPanel)
figure()
newaxes()
plot(-stp,voltank5,"o-",-stp,voltank4,"x-",-stp,voltank3,"d-")
xlabel("Slide Distance(m)")
ylabel("Tank Volume(m3)")
title("Tank Volume x Slide Distance", "fontsize",3)
figure()
newaxes()
disp(AP,FP)
plot(-stp,AP,"o-",-stp,FP,"x-")
xlabel("Slide Distance(m)")
ylabel("Draft(m)")
title("Draft AP&FP x Slide Distance", "fontsize",3)
end
plotlevel(Result,db)
messagebox("Calculation Complete")
endfunction

```

Hasil Run: Draft = 3, Trim = 2°, Slide Distance = 20, Step = 4

Skripsi ver.1

Input

Draft: 3 m

Trim: 2 deg

Jacket

Slide: 20

Step: 4

Output

CB: X: 28.851871, Y: -0.0049833, Z: -1.6521423

Displacement: 1742.1072 Ton

Vol. Tank 1: 0 m³

Vol. Tank 2: 335.34574 m³

Vol. Tank 3: 672.46843 m³

Vol. Tank 4: 243.1109 m³

Vol. Tank 5: 187.66846 m³

Recap

	Disp.	VT1	VT2	VT3	VT4	VT5
step0	1080...0	335...	322...	84.2...	50.5...	
step1	1243...0	335...	435...	113...	67.9...	
step2	1407...0	335...	549...	142...	85.3...	
step3	1574...0	335...	665...	171...	102...	
step4	1645...0	335...	672...	200...	136...	
step5	1742...0	335...	672...	243...	187...	

PLOT

RUN

Graphic window number 7

Tank Volume x Slide Distance

Tank Volume(m³)

Slide Distance(m)

Graphic window number 9

Water Level at Step 5

Polyspace_Workspace

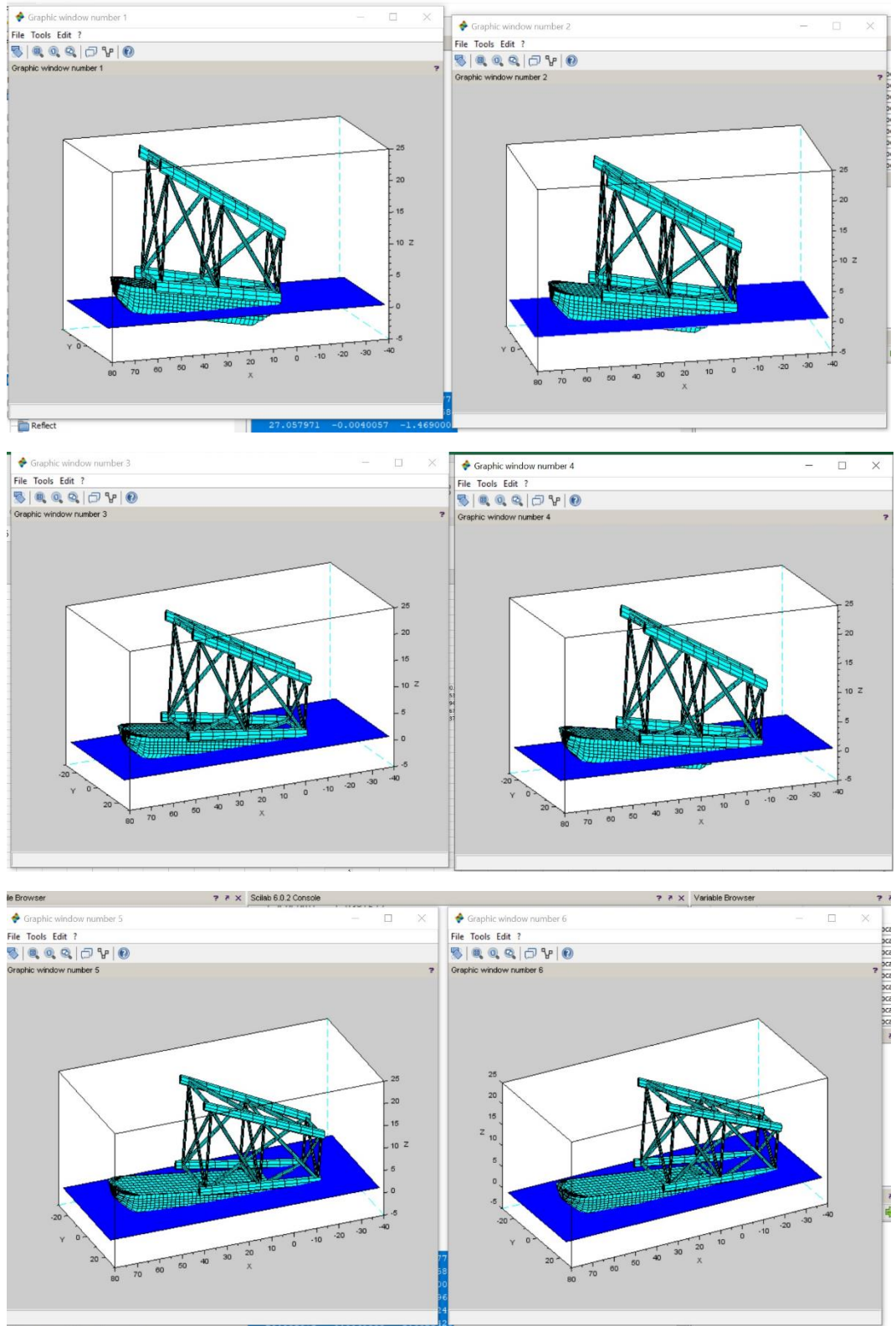
26.156734 -0.0041419 -1.390088

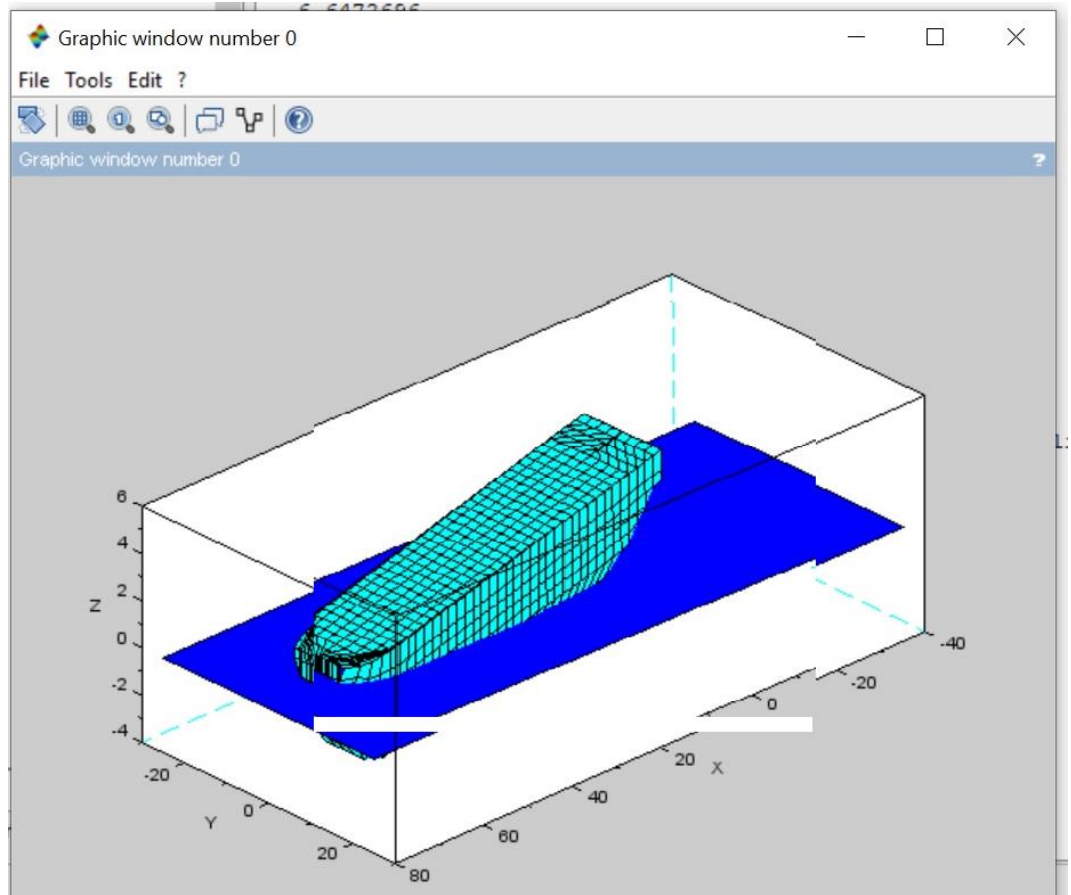
27.057971 -0.0040057 -1.4690008

27.950214 -0.0051526 -1.5571961

28.300294 -0.005081 -1.6014244

28.851871 -0.0049833 -1.6521423



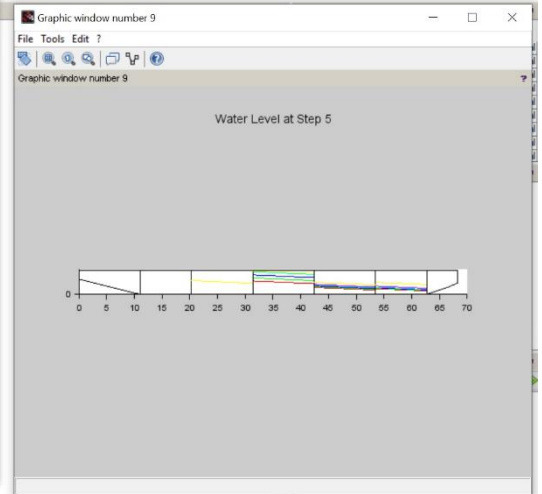
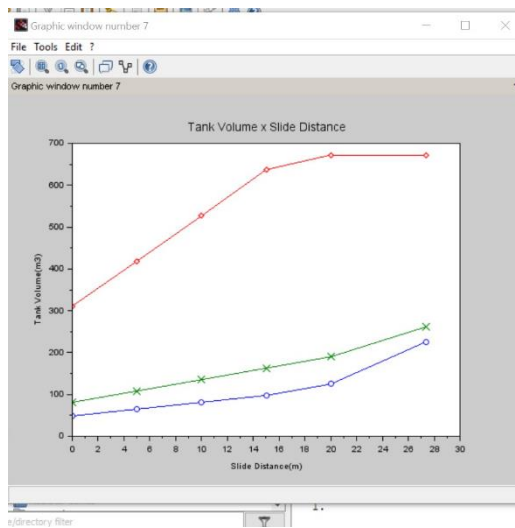


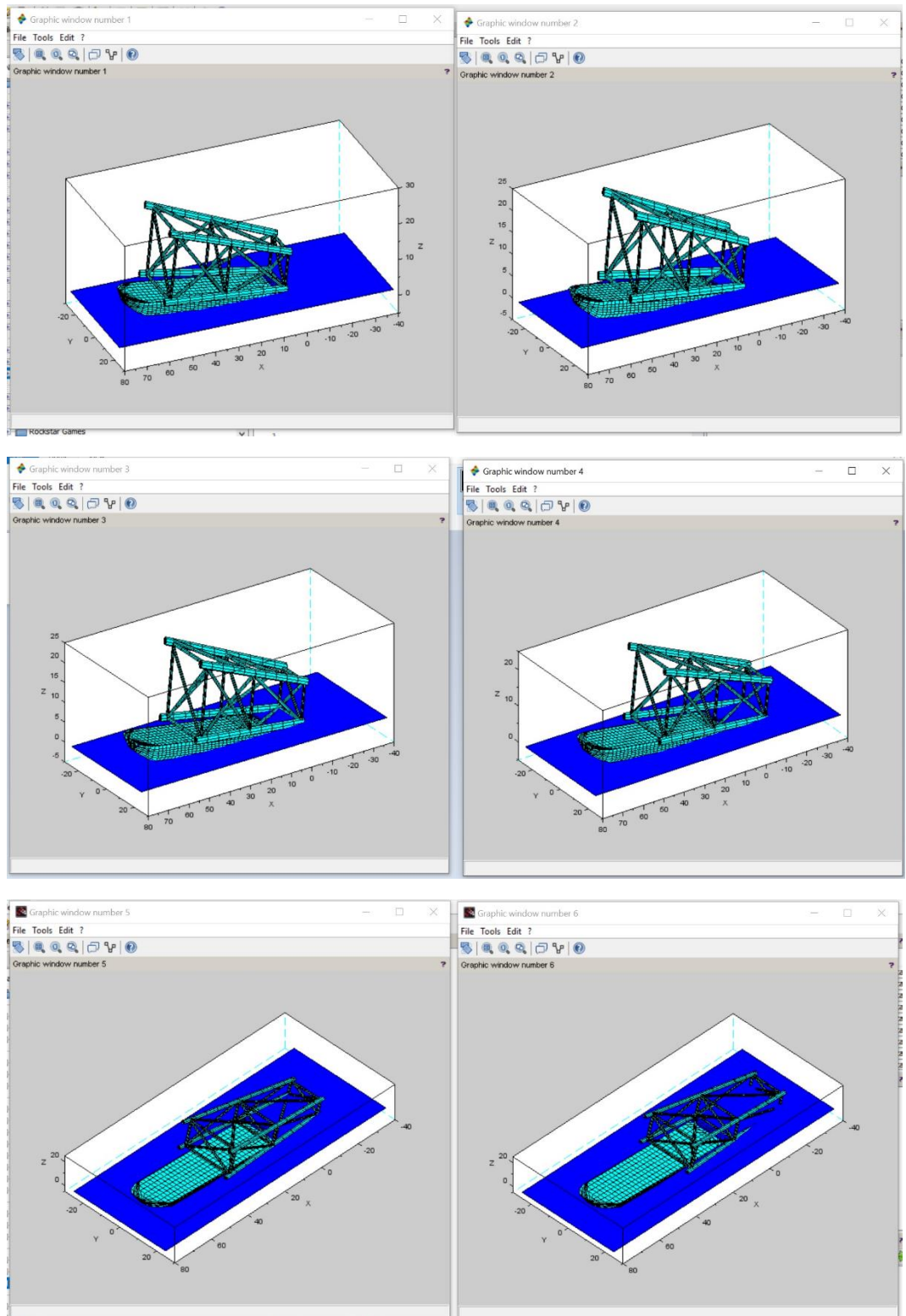
Hasil Run: Draft = 3, Trim = 2.5°, Slide Distance = 20, Step = 4

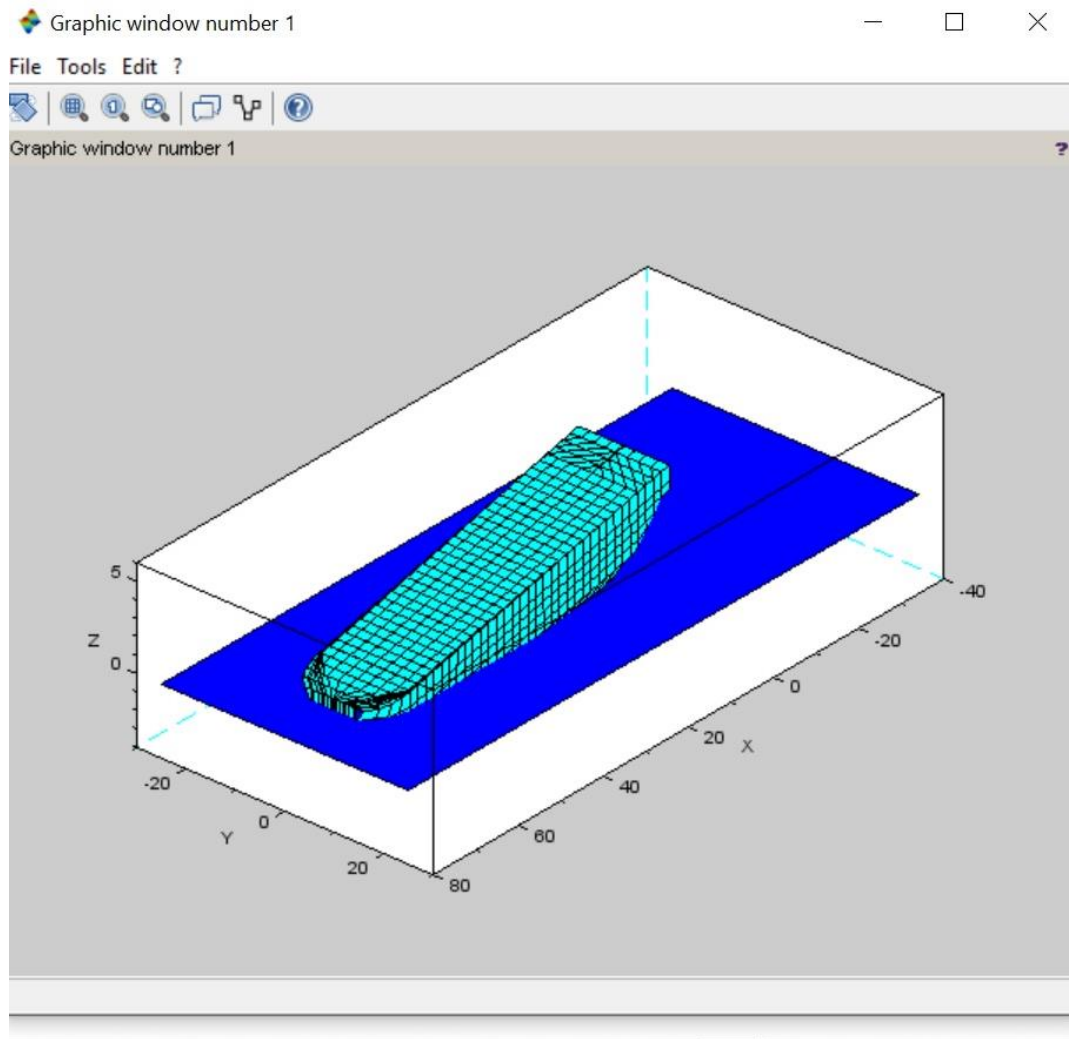
The screenshot shows the main interface of the 'Skripsi ver.1' software. It is divided into several sections:

- Input:** Draft is set to 3 m, and Trim is set to 2.5 deg.
- Jacket:** Slide is set to 20, and Step is set to 4.
- Output:** CB is 28.710549, Displacement is 1774.2588 Ton, and five tank volumes are listed: Vol. Tank 1 (0 m³), Vol. Tank 2 (325.81396 m³), Vol. Tank 3 (672.48098 m³), Vol. Tank 4 (261.69978 m³), and Vol. Tank 5 (225.90631 m³).
- Recap Table:**

	Dep.	VT1	VT2	VT3	VT4	VT5
step0	1036...	0	325...	311...	80.9...	48.5...
step1	1191...	0	325...	418...	108...	64.9...
step2	1347...	0	325...	526...	135...	81.2...
step3	1505...	0	325...	637...	162...	97.5...
step4	1597...	0	325...	672...	190...	124...
step5	1774...	0	325...	672...	251...	225...
- Buttons:** 'PLOT' and 'RUN' buttons are visible at the bottom.
- 3D Plot:** A 3D wireframe model of a ship hull is shown on a blue slide plane, with axes X, Y, and Z.





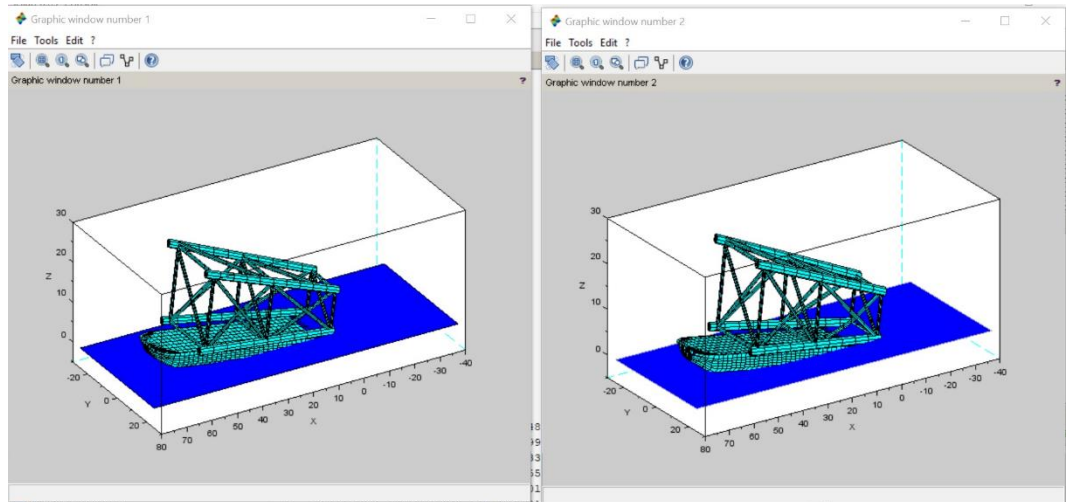
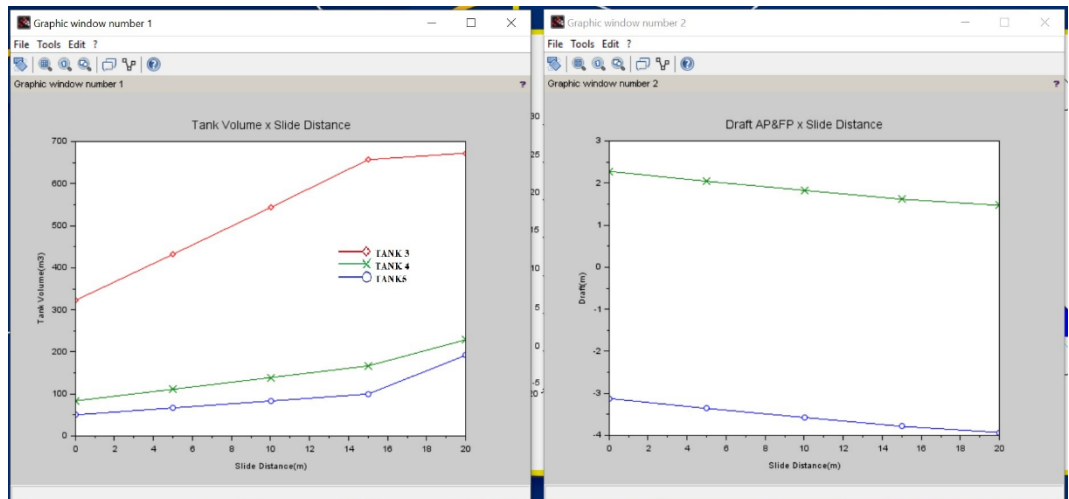


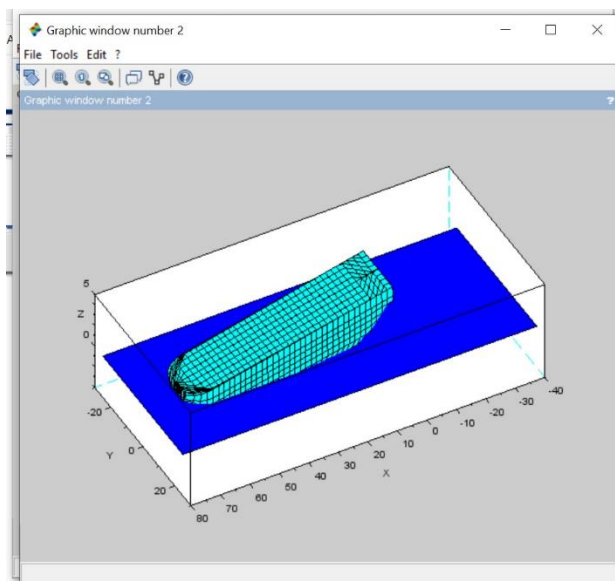
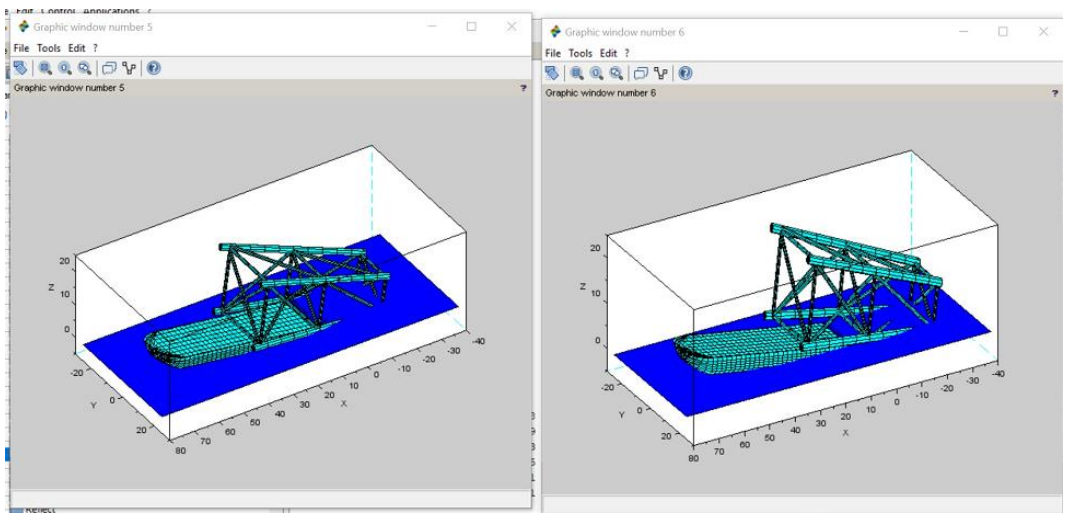
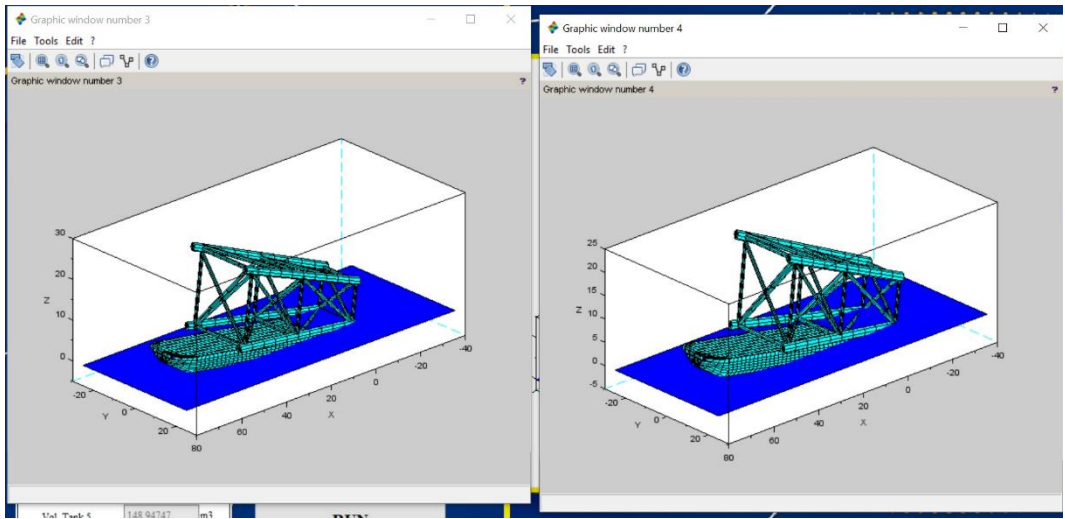
Hasil Run: Draft = 3, Trim = 3°, Slide Distance = 20, Step = 4

The software interface is divided into several sections:

- Input:** Draft = 3 m, Trim = 3 deg.
- Jacket:** Slide = 20, Step = 4.
- Output:**
 - CB: X: 27.438322, Y: -0.0105769, Z: -2.3965101
 - Displacement: 1604.9927 Ton
 - Vol. Tank 1: 0 m³
 - Vol. Tank 2: 316.28942 m³
 - Vol. Tank 3: 672.4711 m³
 - Vol. Tank 4: 209.66778 m³
 - Vol. Tank 5: 148.94747 m³
- Recap Table:**

	Dep.	VT1	VT2	VT3	VT4	VT5
step0	974...	0	316...	294...	76.3...	45.8...
step1	1113...	0	316...	390...	100...	60.3...
step2	1253...	0	316...	487...	124...	74.9...
step3	1390...	0	316...	583...	149...	89.5...
step4	1638...	0	316...	672...	213...	1378...
step5	1604...	0	316...	672...	209...	148...
- Buttons:** PLOT, RUN
- 3D Model:** A wireframe model of a ship hull is shown in a 3D coordinate system with X, Y, and Z axes.

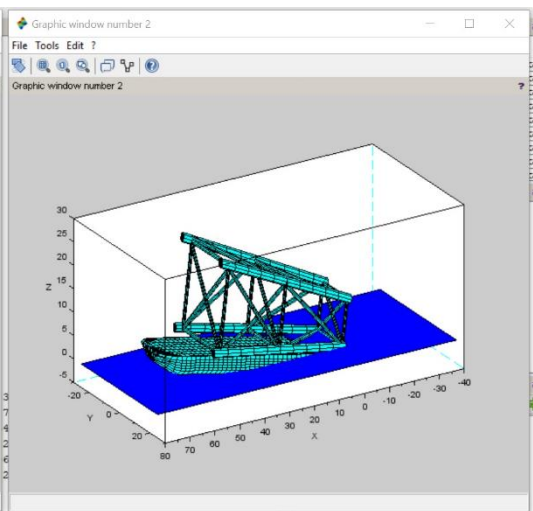
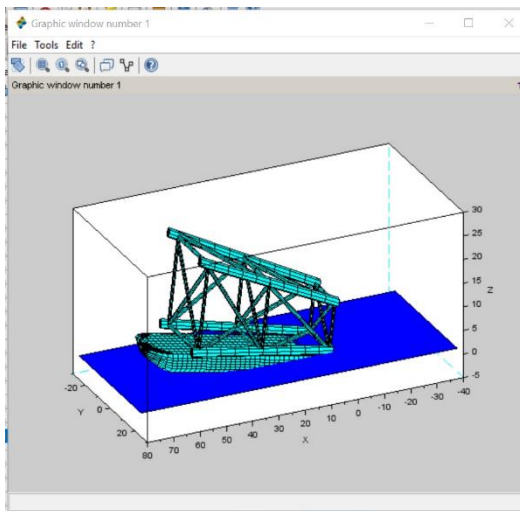
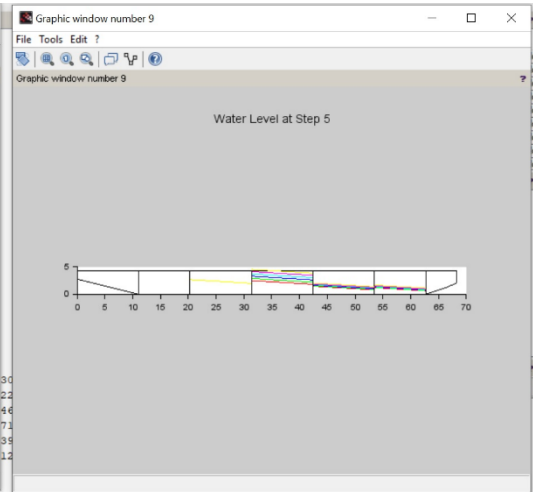
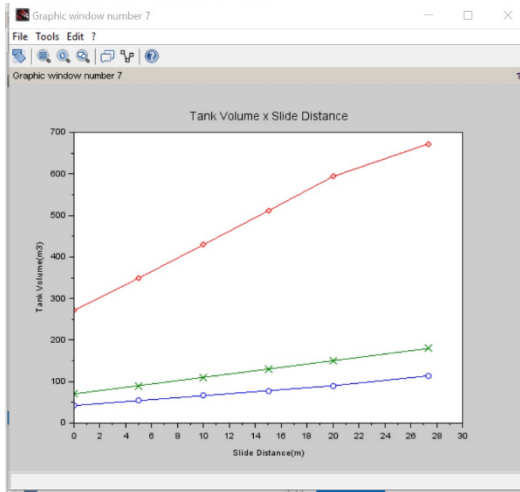


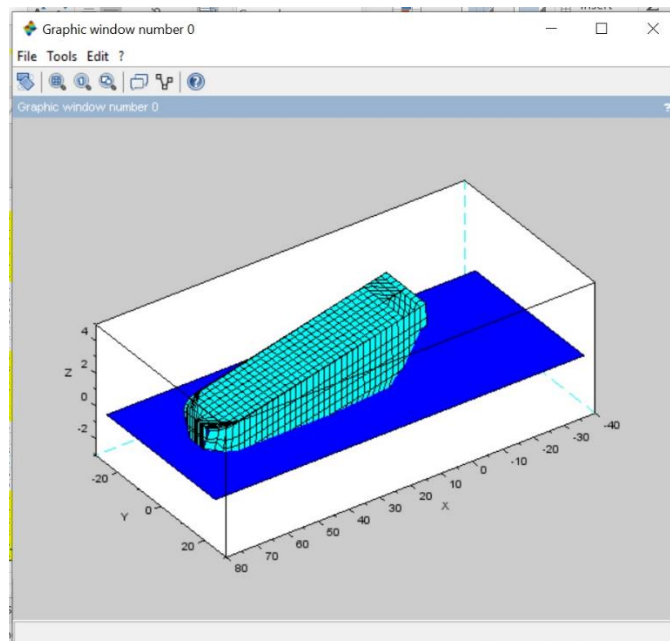
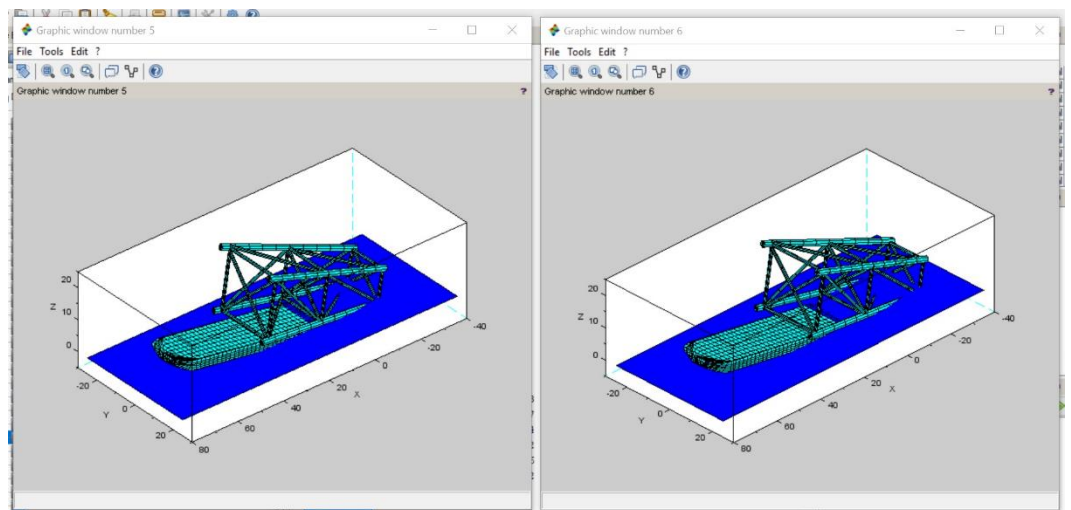
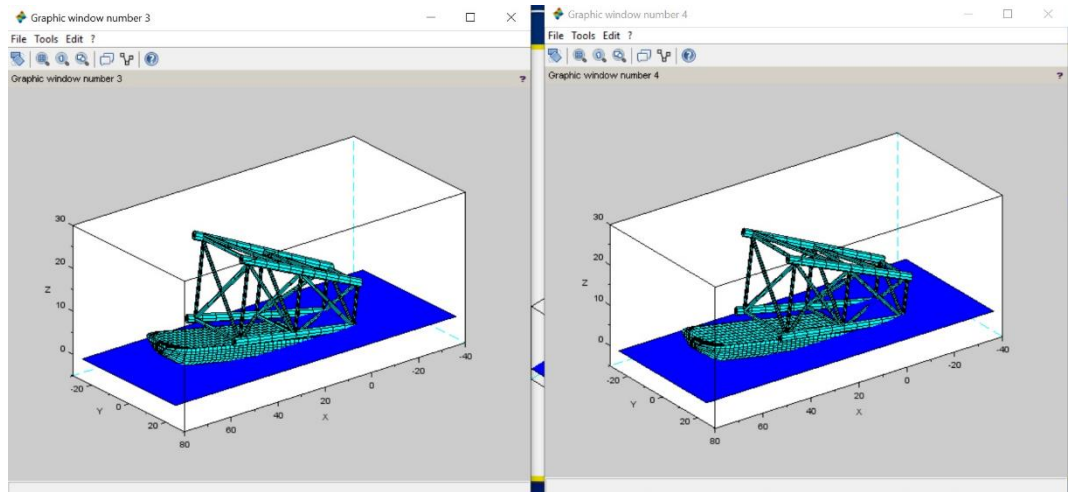


Hasil Run: Draft = 3, Trim = 3.5°, Slide Distance = 20, Step = 4

The screenshot shows the Skripoti ver.1 software interface. On the left, there are input fields for Draft (3 m) and Trim (3.5 deg) under the 'Input' section, and Slide (20) and Step (4) under the 'Jacket' section. Below these are output fields for CB (X: 26.184019, Y: -0.0144968, Z: -2.6312122), Displacement (1488.7202 Ton), and five tank volumes (Vol. Tank 1 to 5). A 'Recap' table is also present, and at the bottom are 'PLOT' and 'RUN' buttons. On the right, a 3D model of a ship's hull is shown in a blue water environment within a coordinate system.

	Disp.	VT1	VT2	VT3	VT4	VT5
step0	891...	0	306...	271...	70.3...	42.1...
step1	1004...	0	306...	349...	90.2...	54.1...
step2	1119...	0	306...	429...	110...	66.1...
step3	1235...	0	306...	511...	130...	78.0...
step4	1353...	0	306...	593...	150...	90.0...
step5	1488...	0	306...	672...	175...	113...





Hasil Run: Draft = 3, Trim = 4°, Slide Distance = 20, Step = 4

Input

Draft: 3 m

Trim: 4 deg

Jacket

Slide: 20

Step: 4

Output

CB X: 24.803182

Y: -0.0189612

Z: -3.8450591

Displacement: 1425.893 Ton

Vol. Tank 1: 0 m³

Vol. Tank 2: 297.33762 m³

Vol. Tank 3: 665.1835 m³

Vol. Tank 4: 166.35469 m³

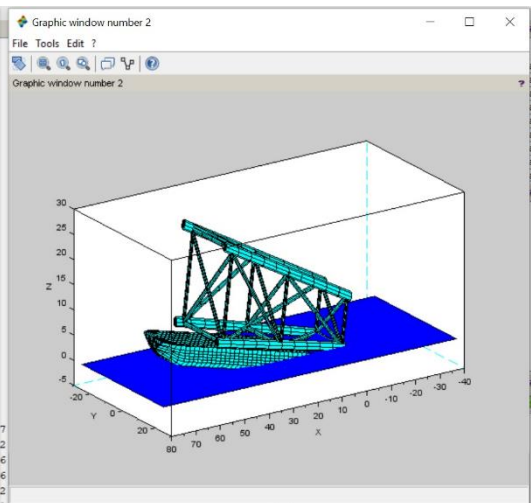
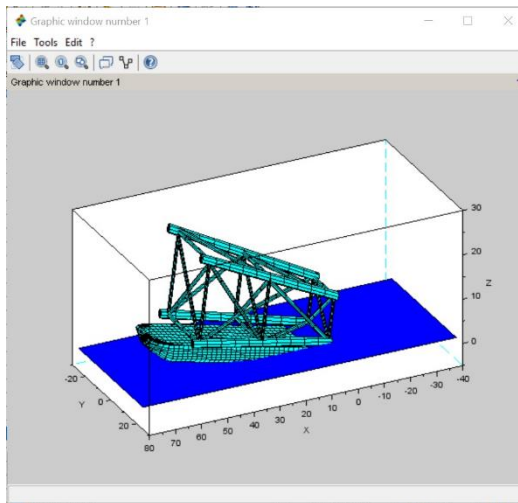
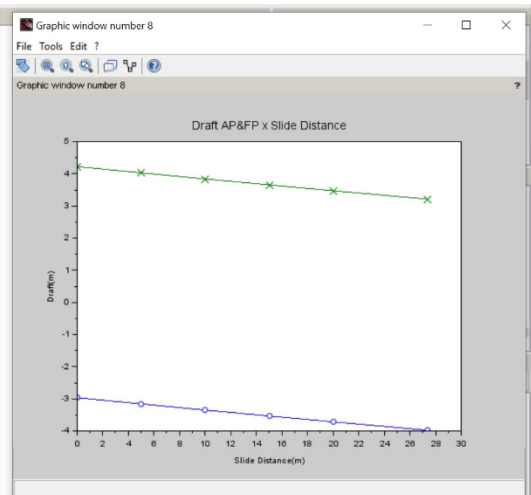
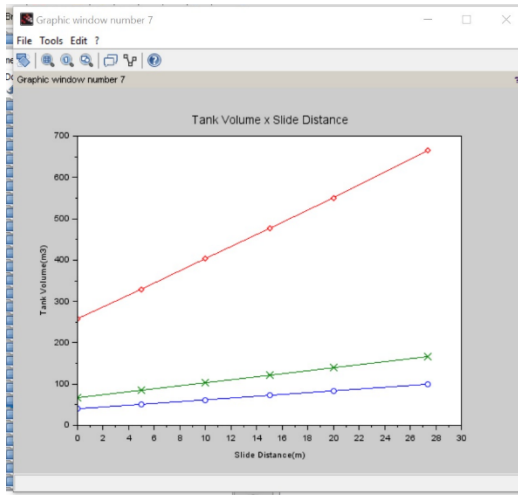
Vol. Tank 5: 99.573301 m³

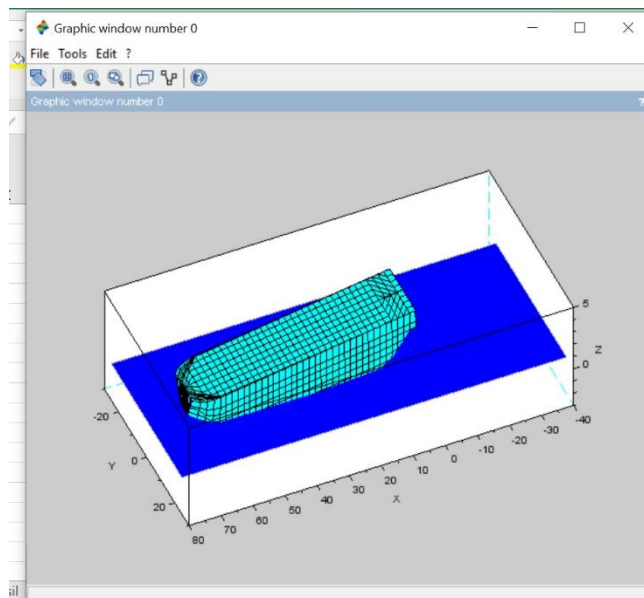
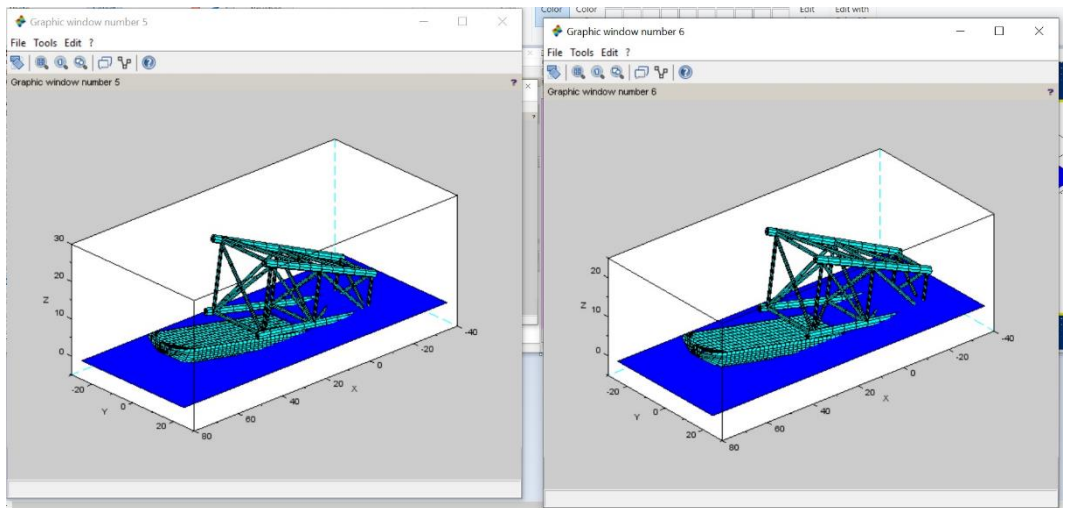
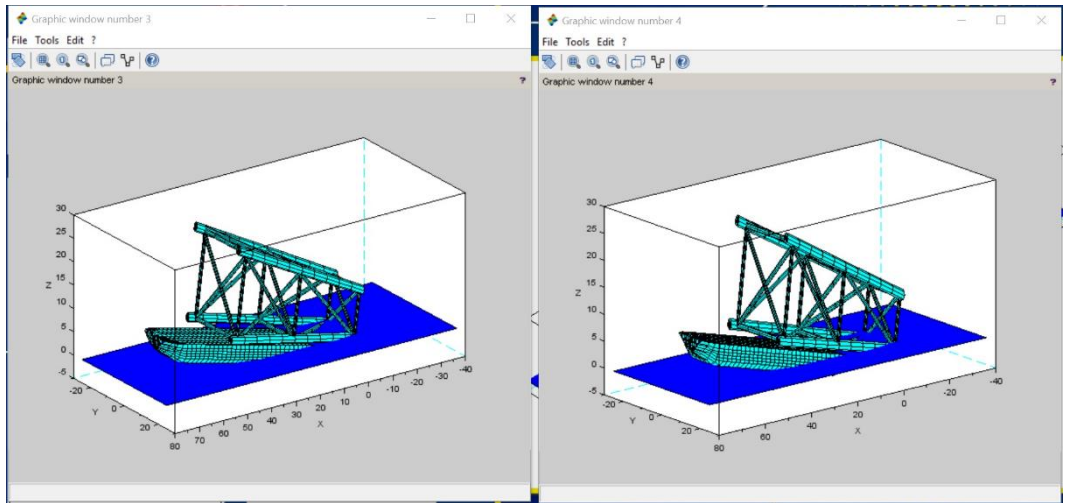
Recap

	Disp.	VT1	VT2	VT3	VT4	VT5
step0	845...	0	297...	257...	66.9...	40.1...
step1	948...	0	297...	329...	85.0...	50.9...
step2	1054...	0	297...	403...	103...	61.8...
step3	1150...	0	297...	476...	121...	72.7...
step4	1264...	0	297...	550...	139...	83.5...
step5	1425...	0	297...	665...	166...	99.5...

PLOT

RUN







SURAT PENUGASAN

No.6371/UN4.7.1/TD.06/2022

Dari : Dekan Fakultas Teknik Universitas Hasanuddin

Kepada : 1. **Rahimuddin, S.T., M.T., Ph.D.** Pemb. I
2. **Dr. Ir. Ganding Sitepu, Dipl.-Ing.** Pemb. II

Isi : 1. Berdasarkan Surat Ketua Departemen Teknik Sistem Perkapalan Fakultas Teknik Nomor : 6370/UN4.7.7/TD.06/2022 tanggal 31 Maret 2022 tentang Dosen PEMBIMBING MAHASISWA, maka dengan ini kami menugaskan Saudara untuk membimbing penulisan Skripsi/Tugas Akhir mahasiswa Teknik Sistem Perkapalan Fakultas Teknik Universitas Hasanuddin di bawah ini :

Nama : **Muhammad Assiddiq** No. Stambuk : **D091171013**

Judul Skripsi/Tugas Akhir :

Simulasi Pengaturan Ballast untuk Kendali Trim pada Barge Jacket Launching

2. Surat penugasan pembimbing ini mulai berlaku sejak tanggal ditetapkannya dan berakhir sampai selesainya penulisan Skripsi/Tugas Akhir Mahasiswa tersebut.
3. Agar surat penugasan ini dilaksanakan sebaik - baiknya dengan penuh rasa tanggung jawab.

Ditetapkan di Gowa,
Pada tanggal, 31 Maret 2022

a.n Dekan,
Wakil Dekan I Bidang Akademik, Riset dan
Inovasi Fakultas Teknik UH

Prof. Baharuddin Hamzah, ST.,M.Arch.,Ph.D
Nip. 19690308 199512 1 001

Tembusan :

1. Dekan FT-UH.
2. Ketua Departemen Teknik Sistem Perkapalan FT-UH.
3. Mahasiswa yang bersangkutan





SURAT PENUGASAN

No.16400/UN4.7.1/TD.06/2022

Dari : Dekan Fakultas Teknik Universitas Hasanuddin

Kepada : Mereka yang tercantum namanya dibawah ini.

- Isi : 1. Bahwa berdasarkan peraturan Akademik Universitas Hasanuddin Tahun 2018 pasal 19 (SK. Rektor Unhas nomor : 2781/UN4.1/KEP/2018), dengan ini menugaskan Saudara sebagai PANITIA UJIAN SARJANA Program Strata Satu (S1) Teknik Sistem Perkapalan Fakultas Teknik Universitas Hasanuddin dengan susunan sebagai berikut :
- Ketua : Rahimuddin, S.T., M.T., Ph.D.
Sekretaris : Dr. Ir. Ganding Sitepu, Dipl.-Ing.
Anggota : 1. Andi Haris Muhammad, S.T., M.T., Ph.D
2. Haryanti Rivai, S.T., M.T..Ph.D.

Untuk menguji bagi mahasiswa tersebut dibawah ini :

Nama/Nim : Muhammad Assiddiq / D091171013

Departemen : Teknik Sistem Perkapalan

Judul Thesis/Skripsi :

Simulasi Pengaturan Ballast untuk Kendali Trim pada Barge Jacket Launching

2. Waktu ujian ditetapkan oleh Panitia Ujian Akhir Program Strata Satu (S1).
3. Agar surat penugasan ini dilaksanakan sebaik-baiknya dengan penuh rasa tanggung jawab.
4. Surat penugasan ini berlaku sejak tanggal ditetapkan sampai dengan berakhirnya Ujian Sarjana tersebut, dengan ketentuan bahwa segala sesuatunya akan ditinjau dan diperbaiki sebagaimana mestinya apabila dikemudian hari ternyata terdapat kekeliruan dalam keputusan ini.

Ditetapkan di Gowa,

Pada tanggal , 9 Agustus 2022

a.n Dekan,

Wakil Dekan Bidang Akademik, Riset dan Inovasi Fakultas Teknik UH

Dr. Amil Ahmad Ilham, S.T., M.IT.

Nip.19731010 199802 1 001

Tembusan :

1. Dekan FT-UH.
2. Ketua Departemen Teknik Sistem Perkapalan FT-UH.
3. Kasubag Umum dan Perlengkapan FT-UH





**KEMENTERIAN PENDIDIKAN, KEBUDAYAAN,
RISET, DAN TEKNOLOGI
UNIVERSITAS HASANUDDIN**

KAMPUS TAMALANREA

JALAN PERINTIS KEMERDEKAAN KM.10 MAKASSAR 90245

TELEPON : 0411-586200 (6 SALURAN), 584002, FAX. 585188

SURAT PERSETUJUAN

Nomor : 193300/UN4.1.1.2.1.1/PK.02.03/2022

Berdasarkan Peraturan Rektor Universitas Hasanuddin tentang Penyelenggaraan Program Sarjana Nomor : 2781/UN4.1/KEP/2018 tanggal 16 Juli 2018, dengan ini menerangkan bahwa :

NIK : 7311030105000002
N a m a : MUHAMMAD ASSIDDIQ
Tempat/Tanggal Lahir : JAKARTA, 1 MEI 2000
NIM : D091171013
Fakultas : TEKNIK
Program Studi : TEK. SISTEM PERKAPALAN

Telah memenuhi syarat untuk Ujian Skripsi Strata I (S1) **PERIODE JULI 2022**. Demikian Surat Persetujuan ini dibuat untuk digunakan dalam proses pelaksanaan ujian skripsi, dengan ketentuan dapat mengikuti wisuda **PERIODE JULI 2022**, jika persyaratan kelulusan/wisuda telah dipenuhi. Terima Kasih.

Makassar, 14 JULI 2022



Kepala Biro Administrasi Akademik
u.b Kepala Sub Bagian Pendidikan dan Evaluasi
Universitas Hasanuddin,

MURSALIM, S.Sos.

NIP. 19730216 199601 1001

Keterangan :

Nomor User : D091171013

Nomor password/pin : 2169976

Alamat Website : <http://unhas.ac.id/akad/wisuda/>

Catatan

1. Bagi Mahasiswa yang telah melaksanakan ujian Sarjana dan dinyatakan lulus, segera menyerahkan lembar pengesahan Skripsi dan Berita Acara Ujian Sarjana ke Sub Bagian Akademik Fakultas, untuk memperoleh nomor Alumni dan didaftar sebagai Wisudawan pada periode berjalan.
2. Jika terjadi perubahan Judul Skripsi agar melaporkan ke Kasubag. Pendidikan Fakultas sebelum didaftar sebagai Wisudawan pada Periode berjalan
3. Pada saat ON-LINE Mahasiswa diharapkan mengisi identitas diri sesuai surat izin ujian ini
4. Surat izin ini hanya berlaku untuk Wisuda periode berjalan (WISUDA PERIODE JULI 2022)





BERITA ACARA UJIAN SARJANA

Terhadap Mahasiswa

Nama : Muhammad Assiddiq
Stambuk : D091171013
Judul : *Simulasi Pengaturan Ballast untuk Kendali Trim pada Barge Jacket Launching*
Hari/Tanggal : Selasa, 16 Agustus 2022
Waktu : 09.00-10.00 Wita
Tempat : Ruang Sidang Teknik Sistem Perkapalan (Daring/Lur
Keputusan Sidang / Catatan : *Lulus, A (86)*

PANITIA UJIAN

No.	Susunan Panitia	Nama	Tanda Tangan
1	Ketua/Anggota	Rahimuddin, S.T., M.T., Ph.D.	1.....
2	Sekretaris/Anggota	Dr. Ir. Ganding Sitepu, Dipl.-Ing.	2.....
3	Anggota	Andi Haris Muhammad, S.T., M.T., Ph.D	3.....
4	Anggota	Haryanti Rivai, S.T., M.T..Ph.D.	4.....

Ketua Sidang,

Rahimuddin, S.T., M.T., Ph.D.
Nip. 19710825 199903 1 002

Gowa ,

2022

Sekretaris Sidang,

Dr. Ir. Ganding Sitepu, Dipl.-Ing.
Nip. 19600425 198811 1 001