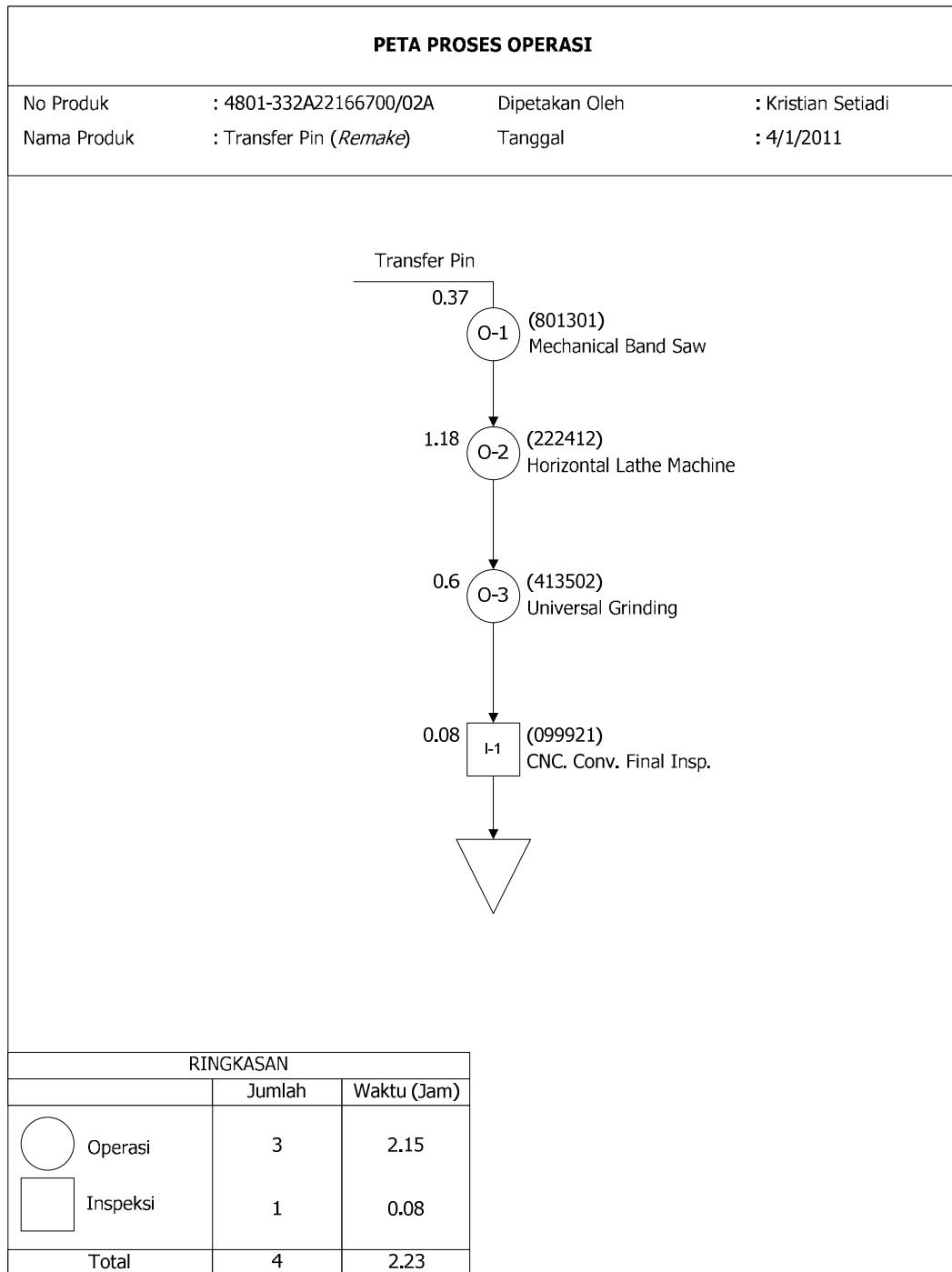
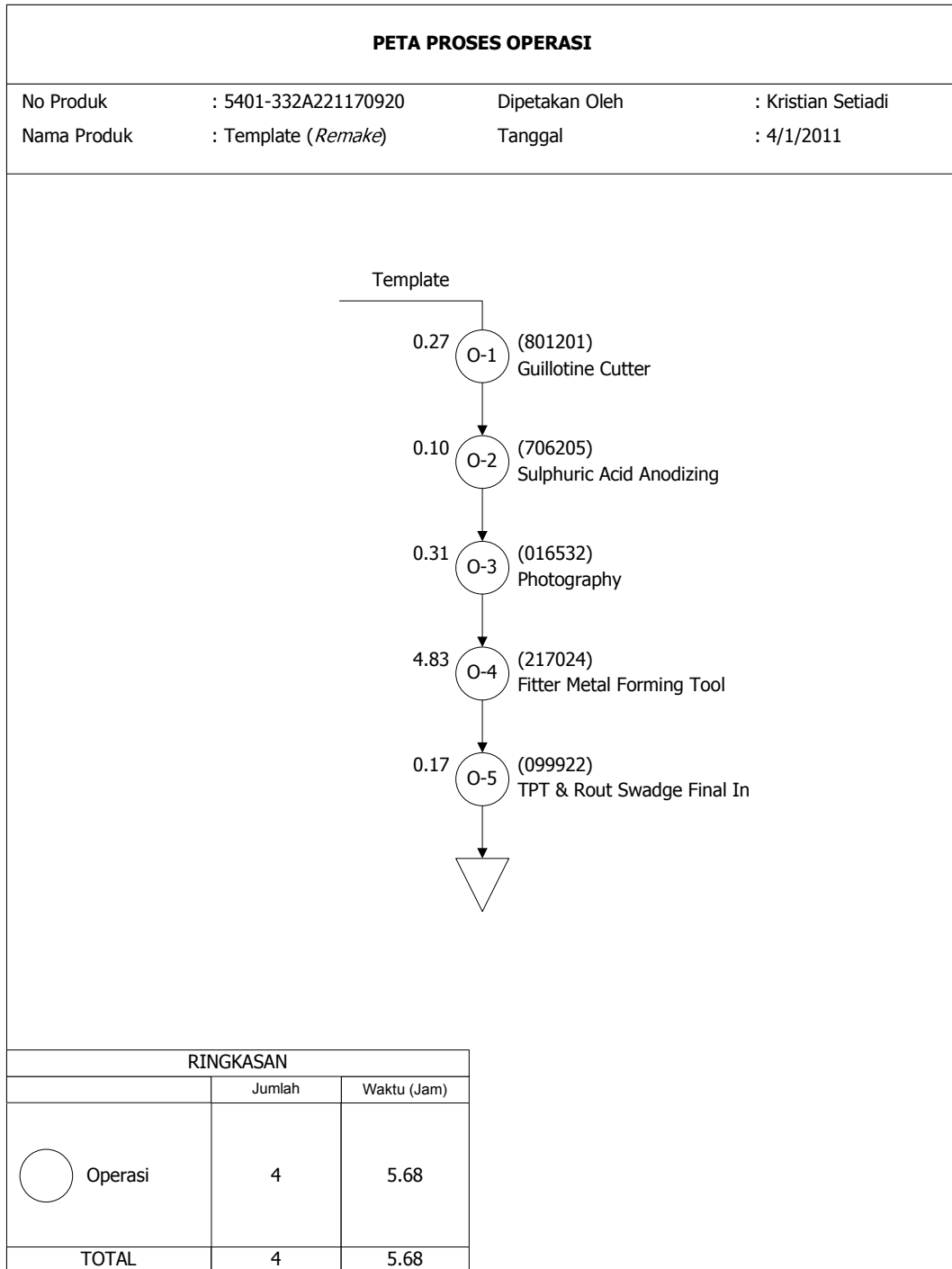


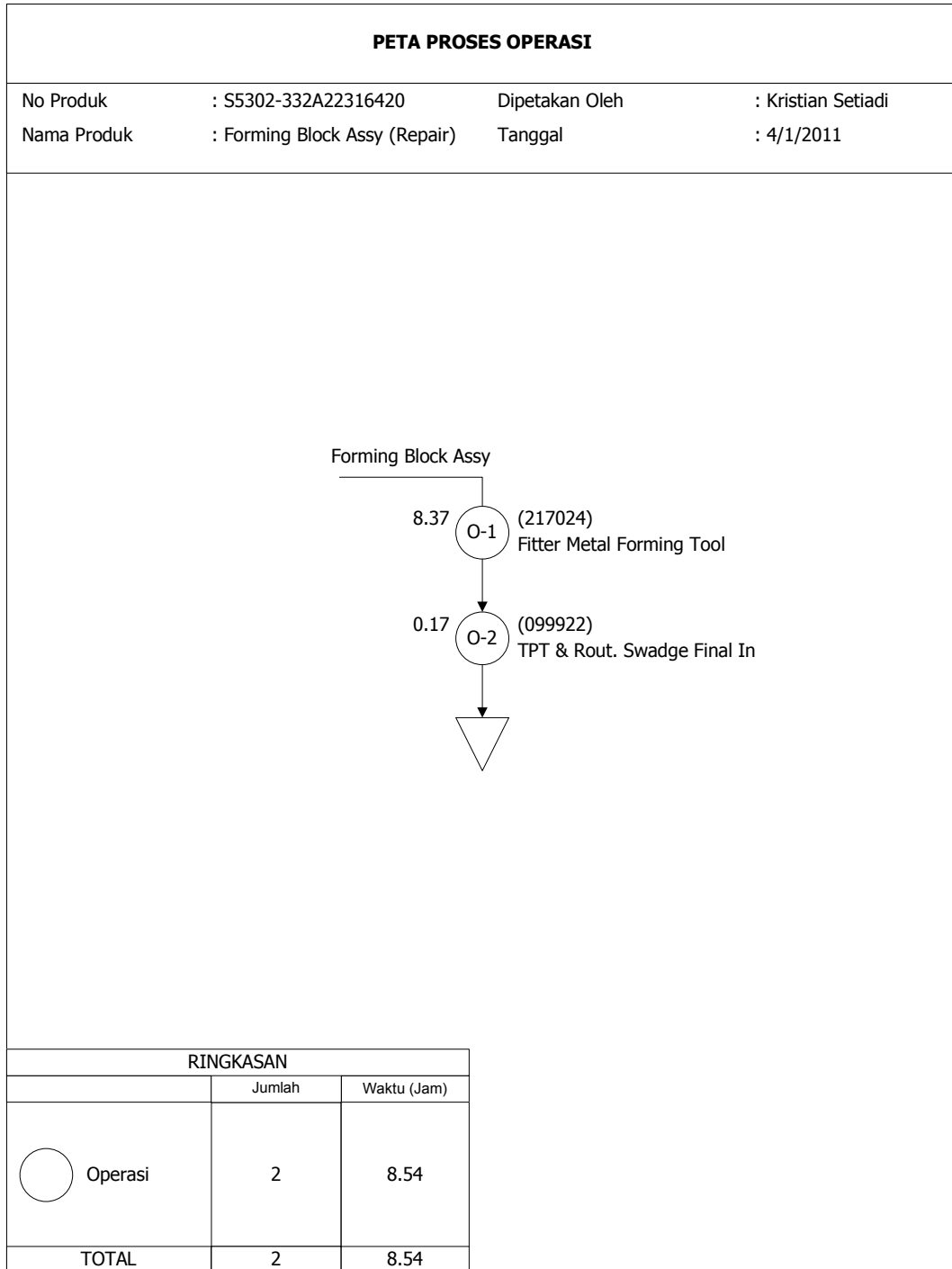
RIWAYAT PENULIS

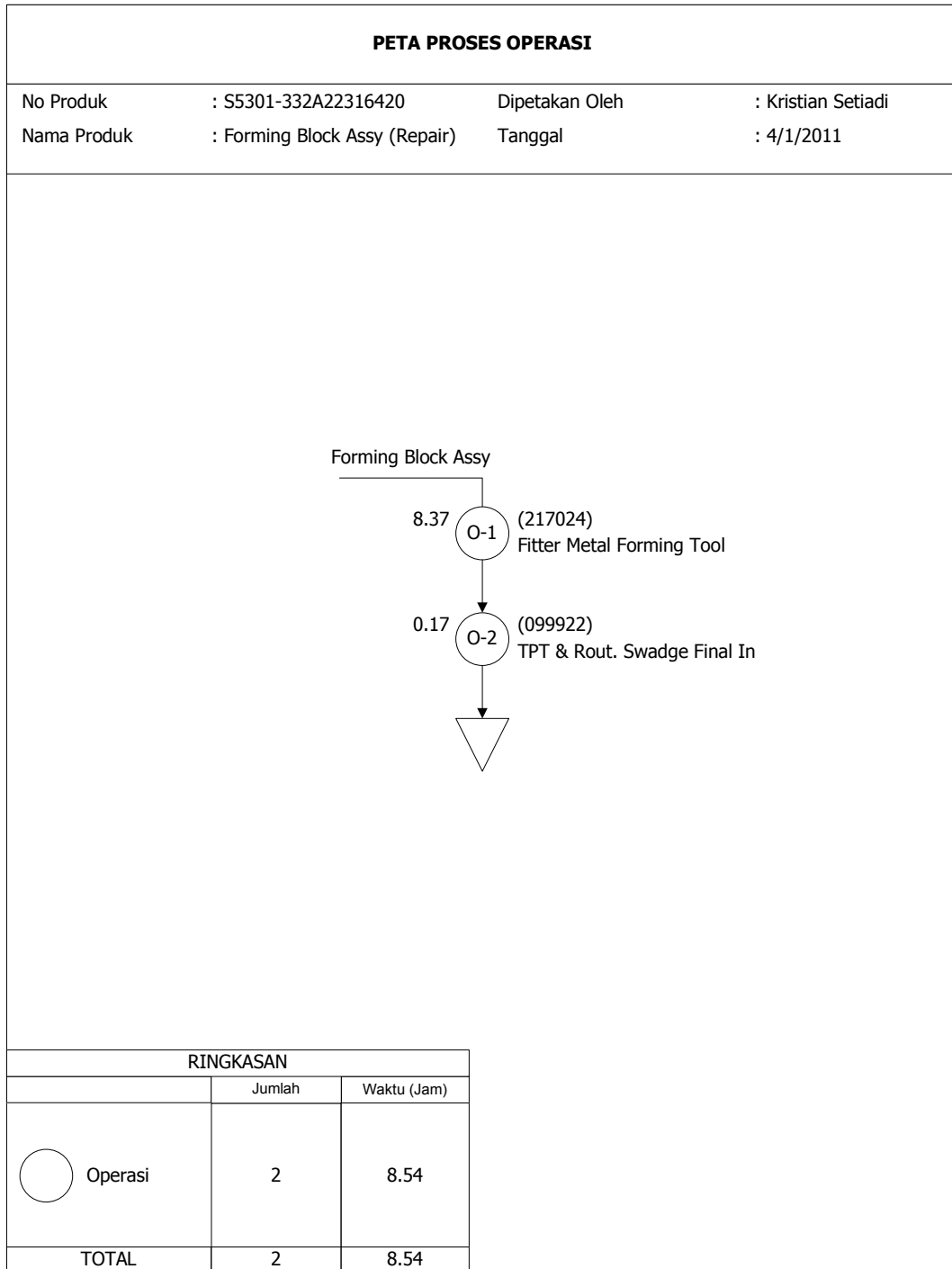
Nama : Kristian Setiadi
Alamat : Sumber Mekar 33-11 Bandung 40222
No. Telp. : 022- 6007060
No. Handphone : 0819-10-341990
Alamat E-mail : kristian.setiadi@hotmail.com
Pendidikan : Jurusan Teknik Industri Universitas Kristen Maranatha
Nilai Tugas Akhir : A
Tanggal USTA : 2 Agustus 2011

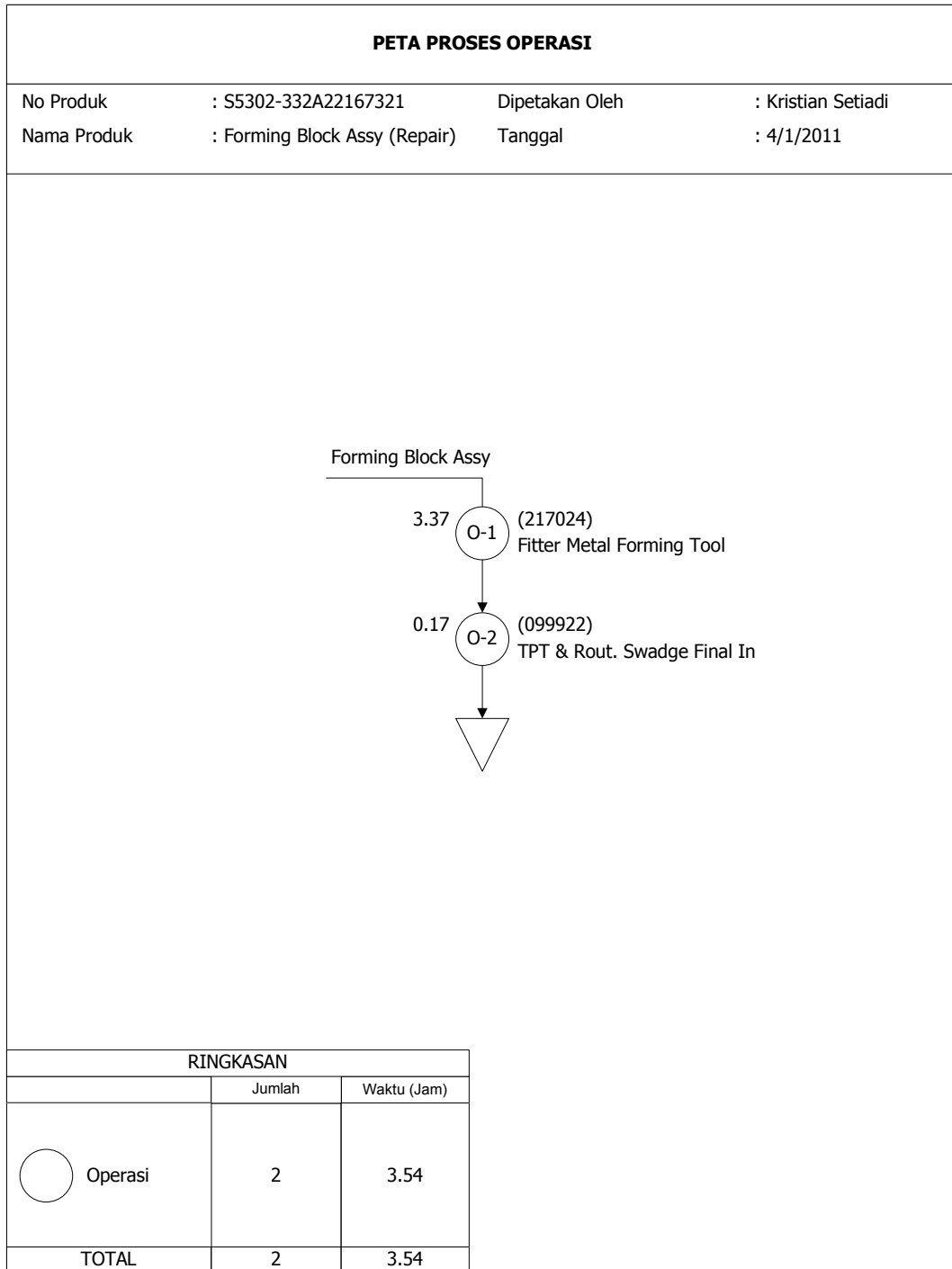
LAMPIRAN A
PETA PROSES OPERASI

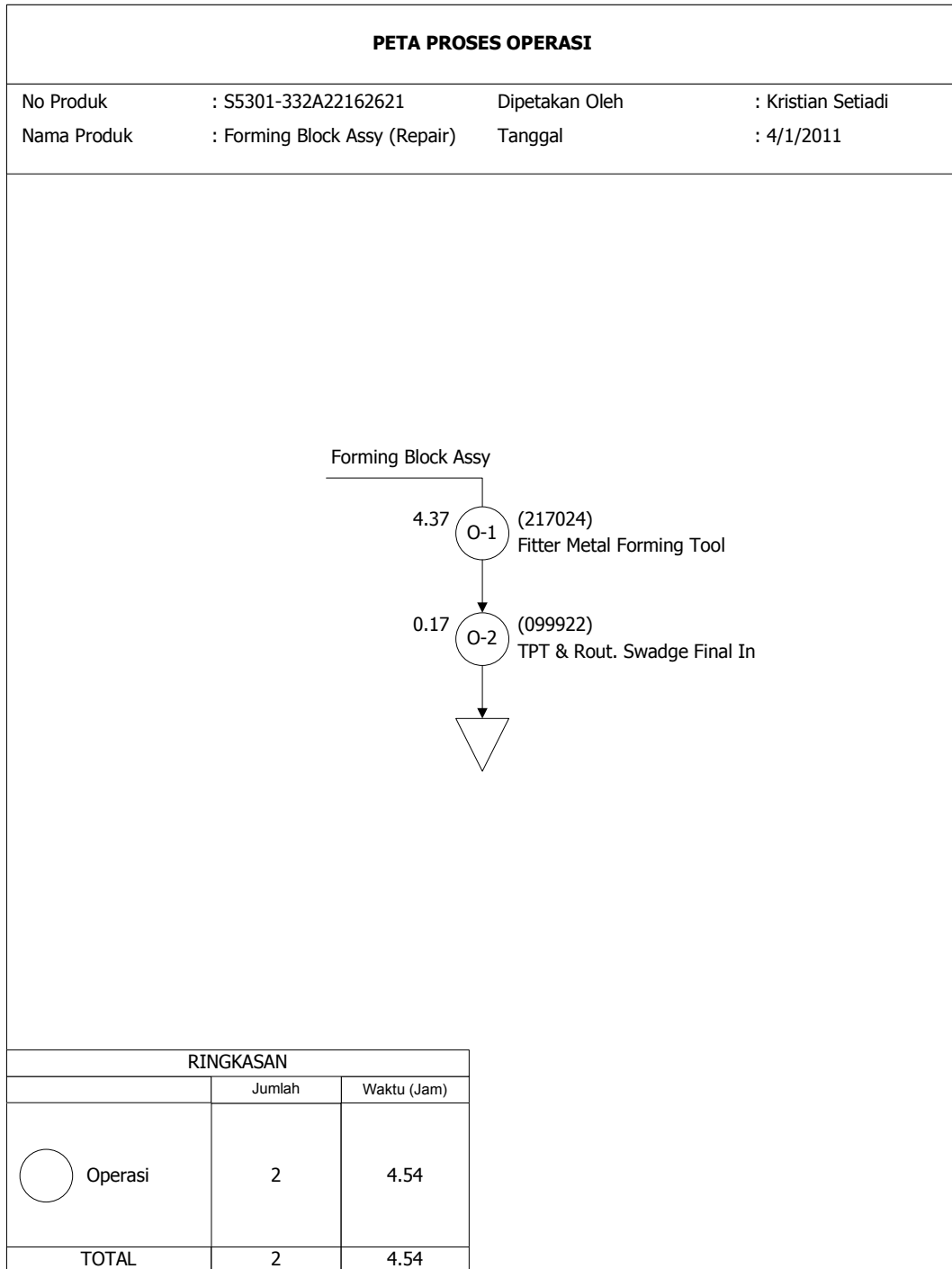


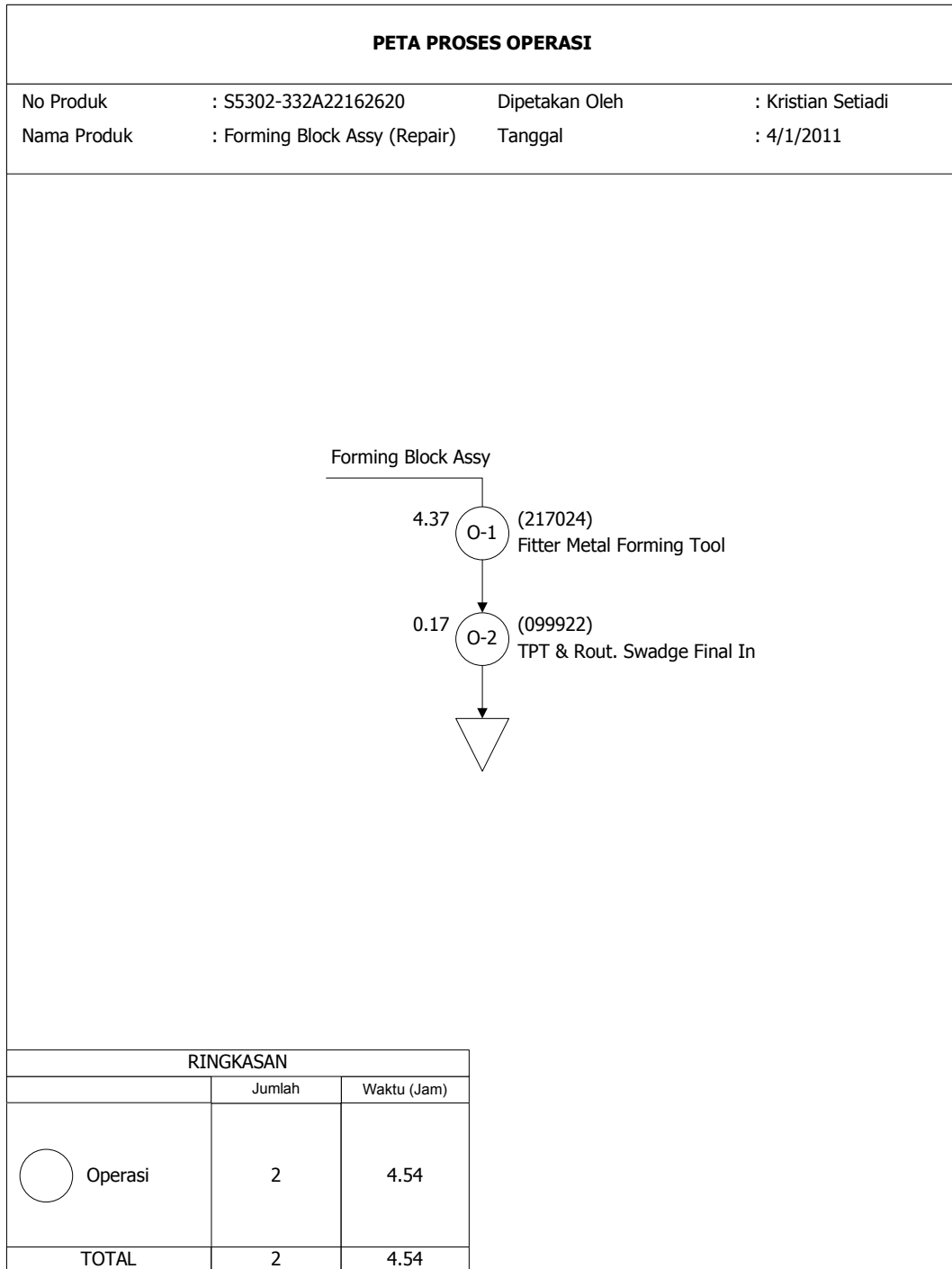


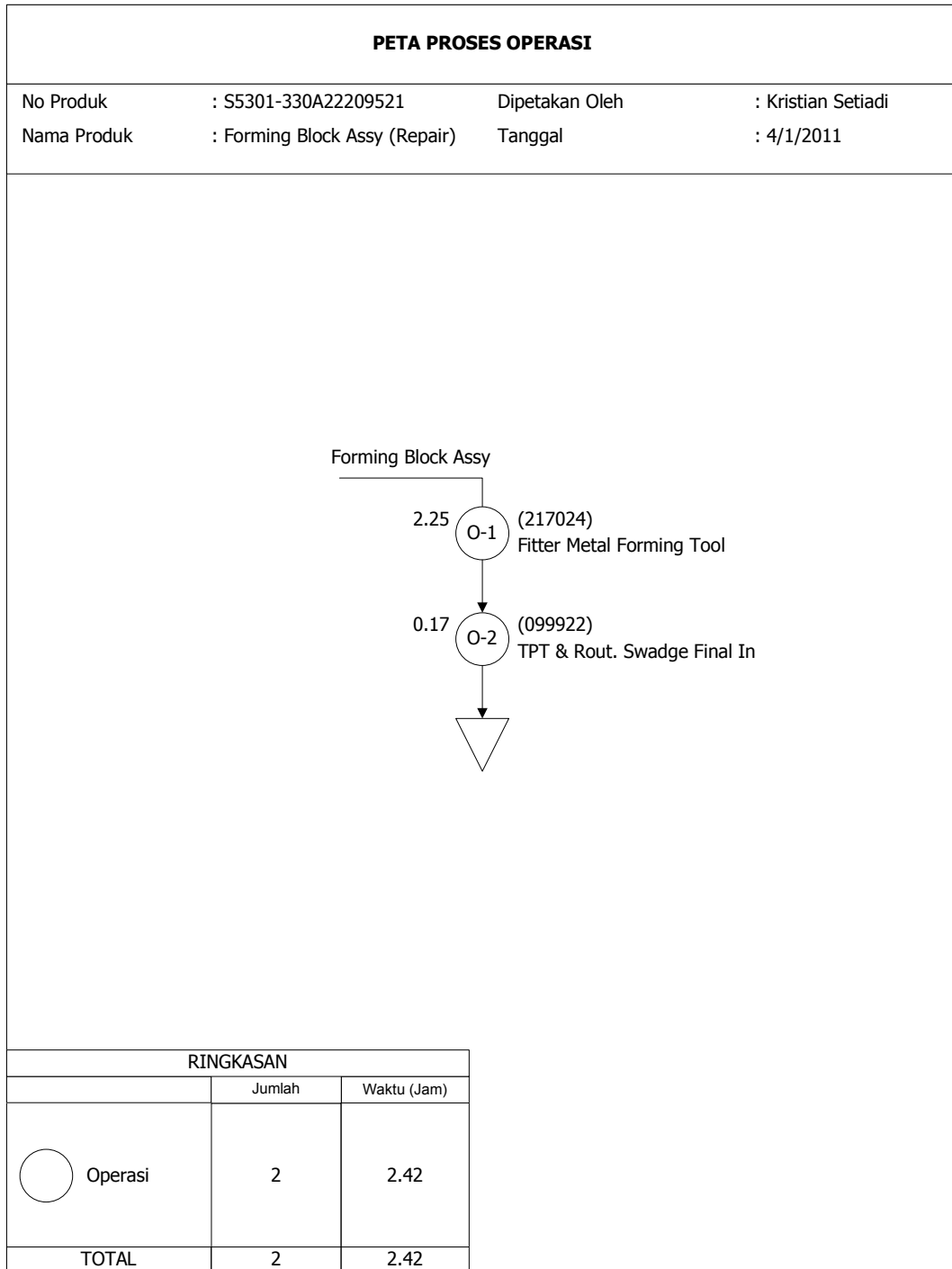


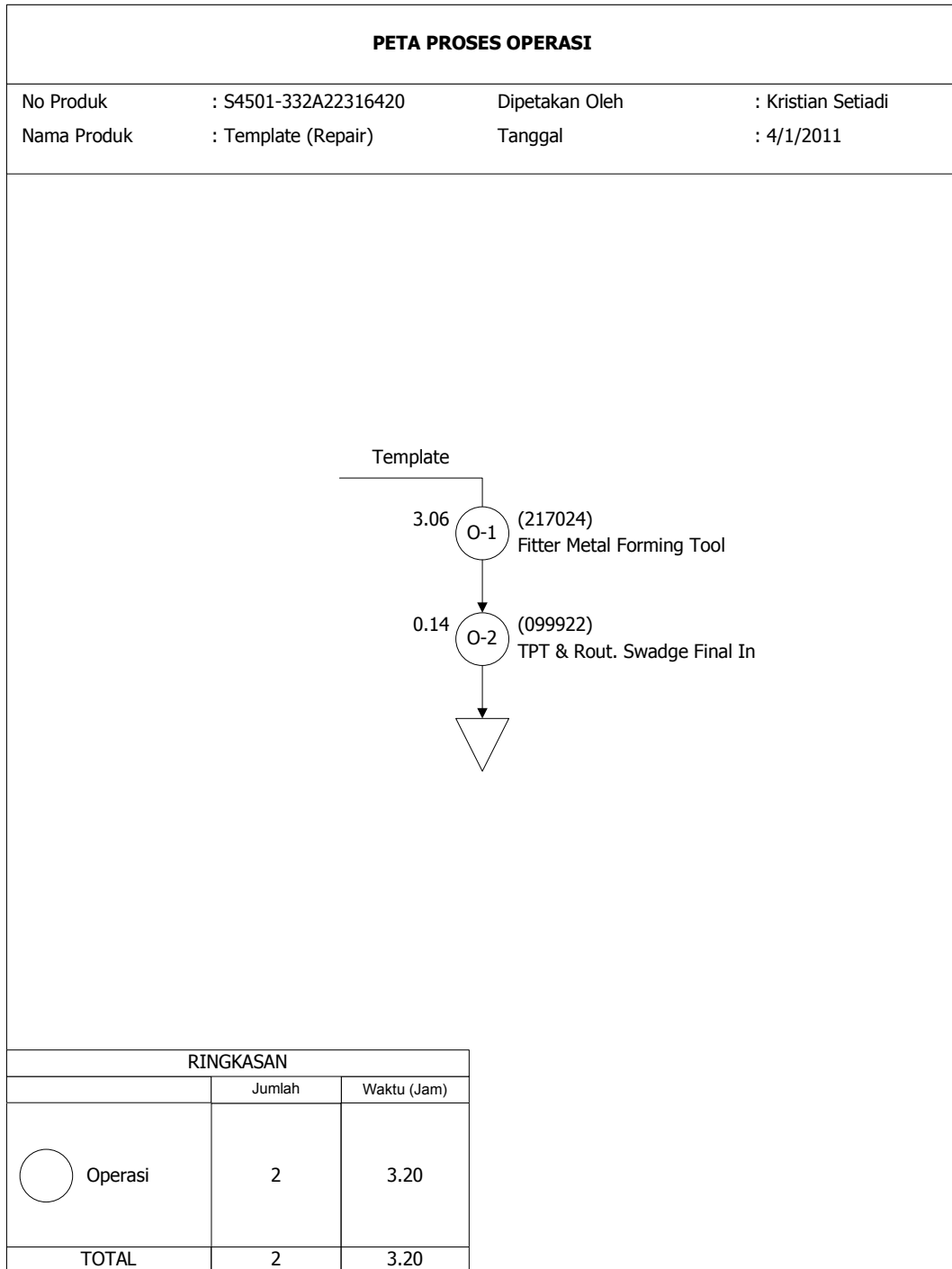


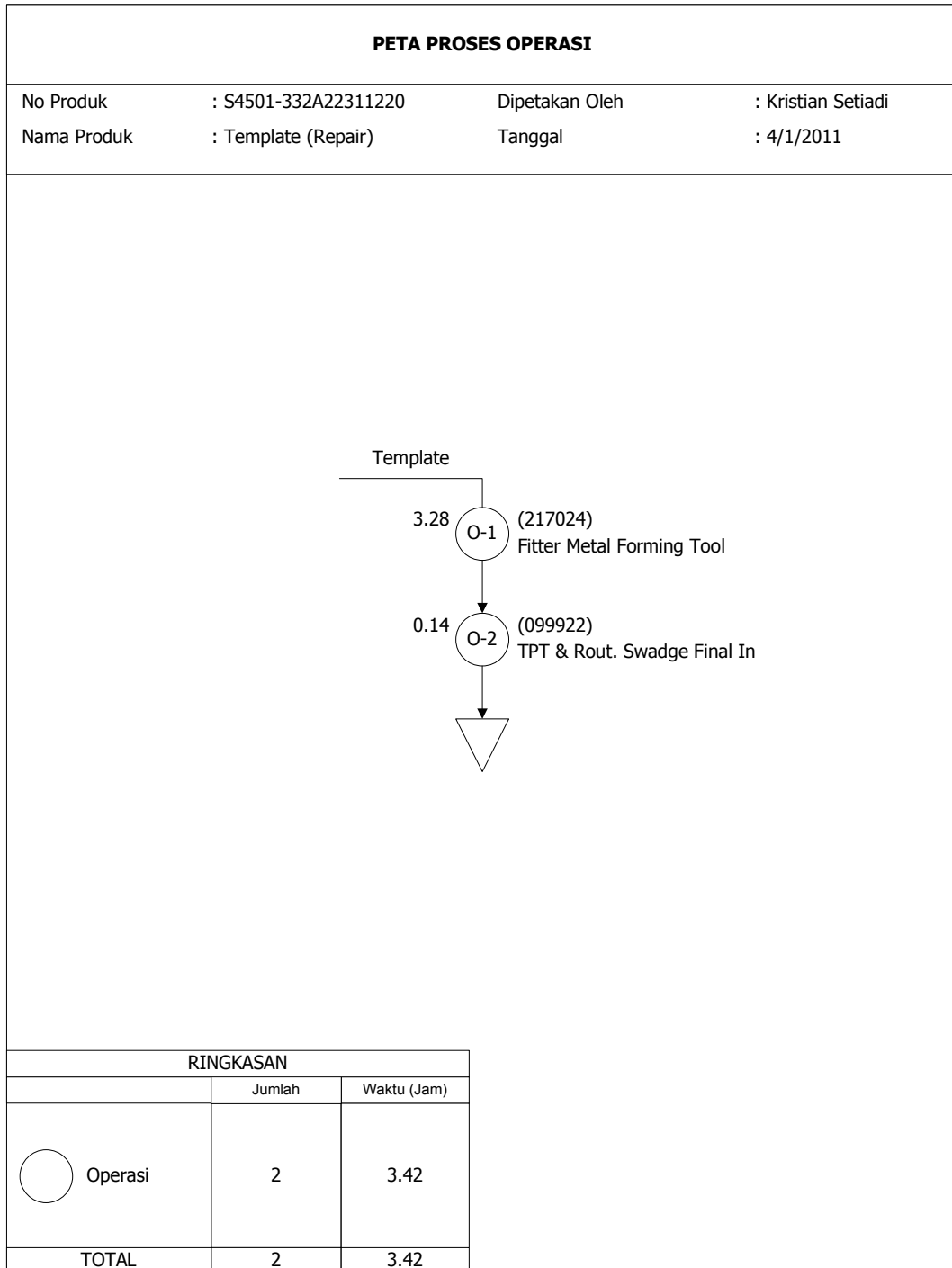


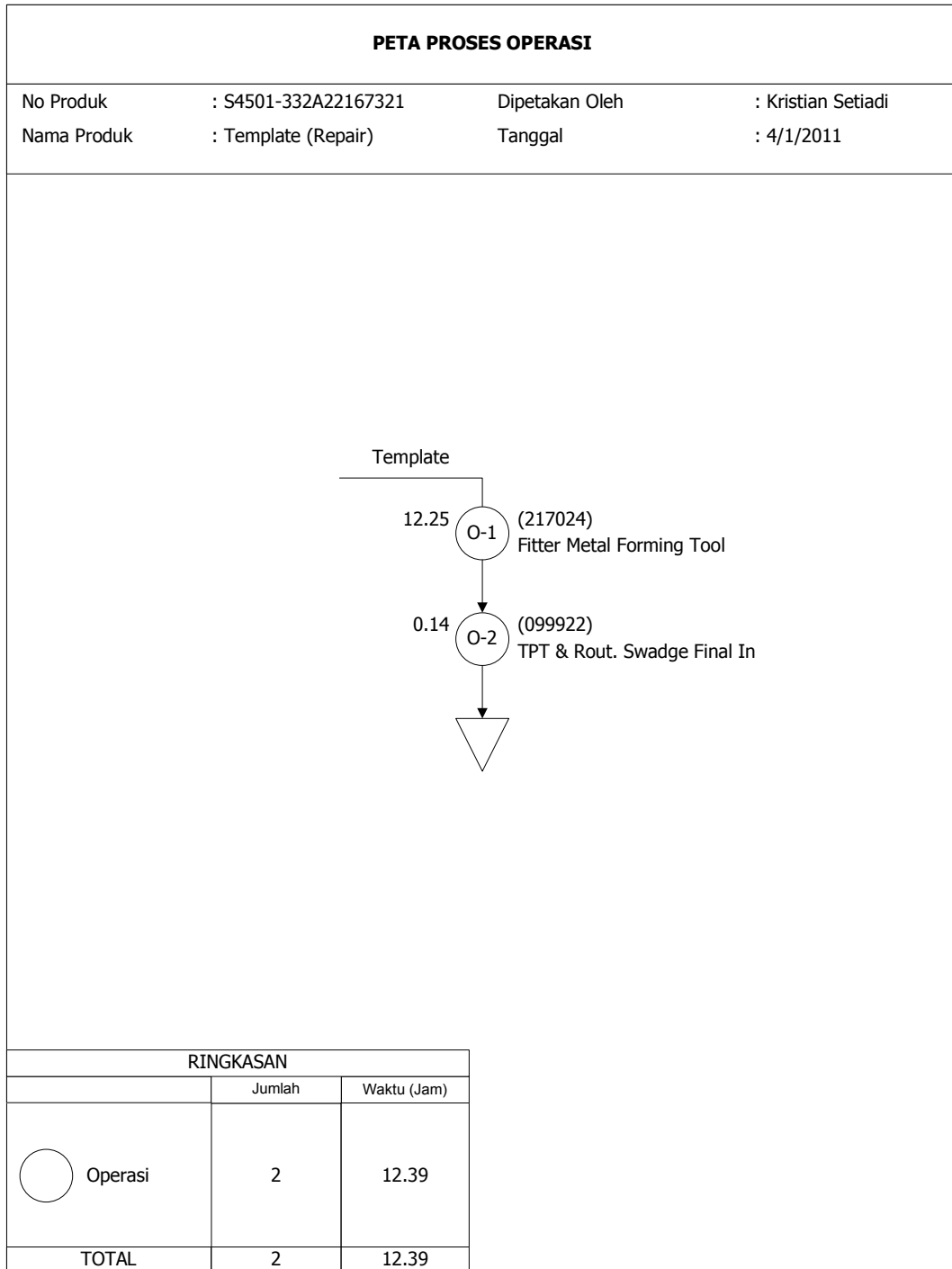


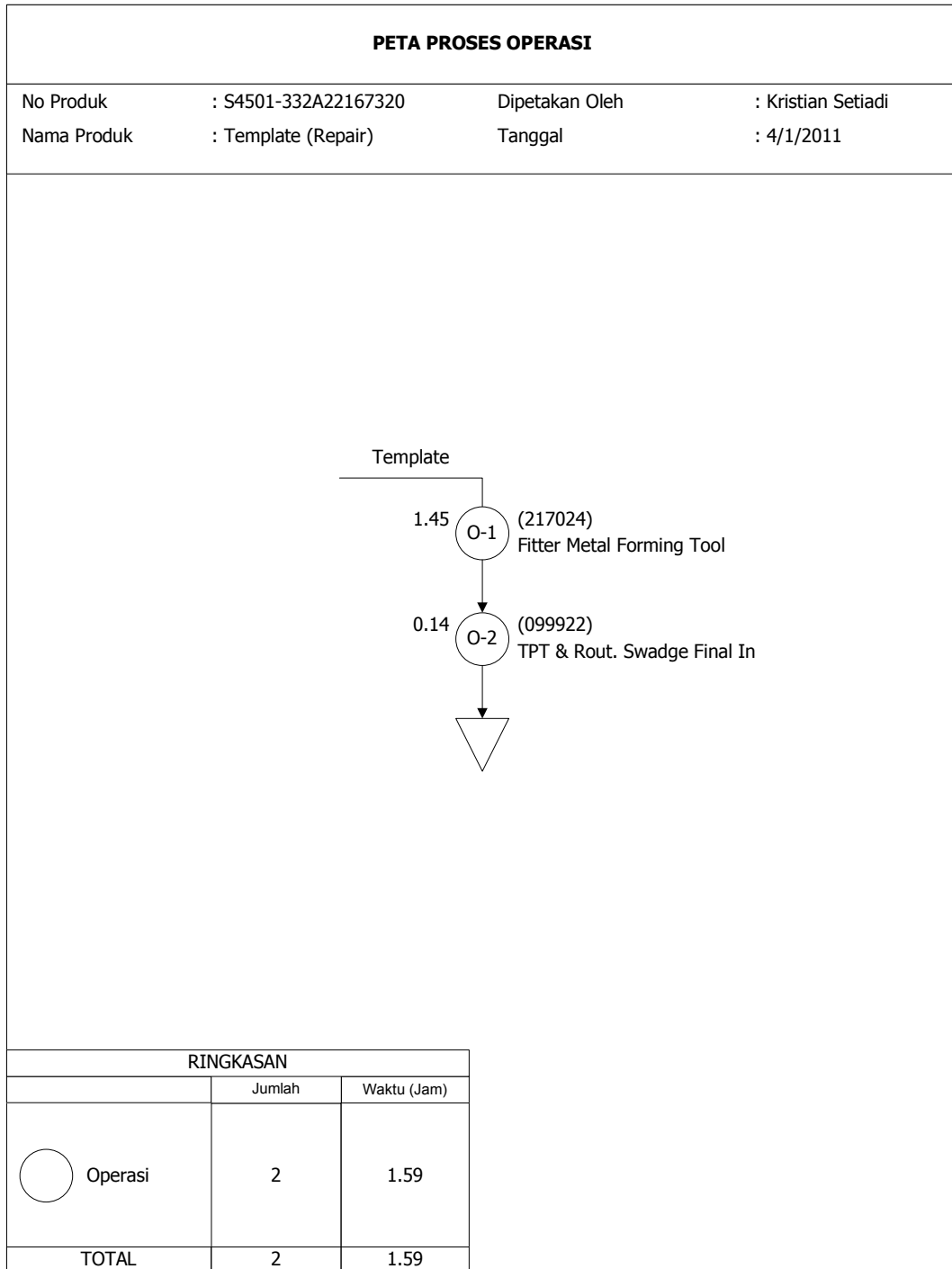


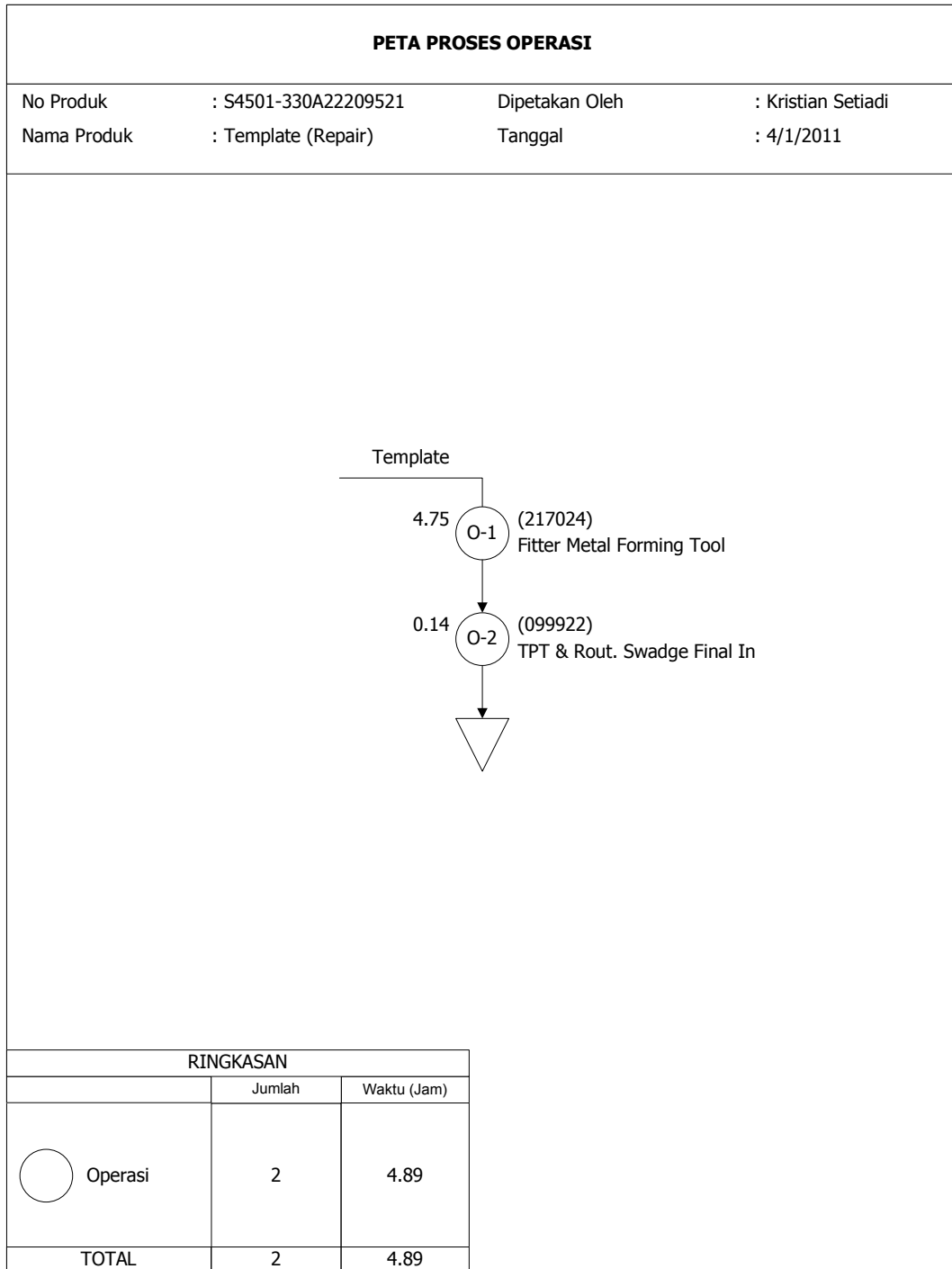


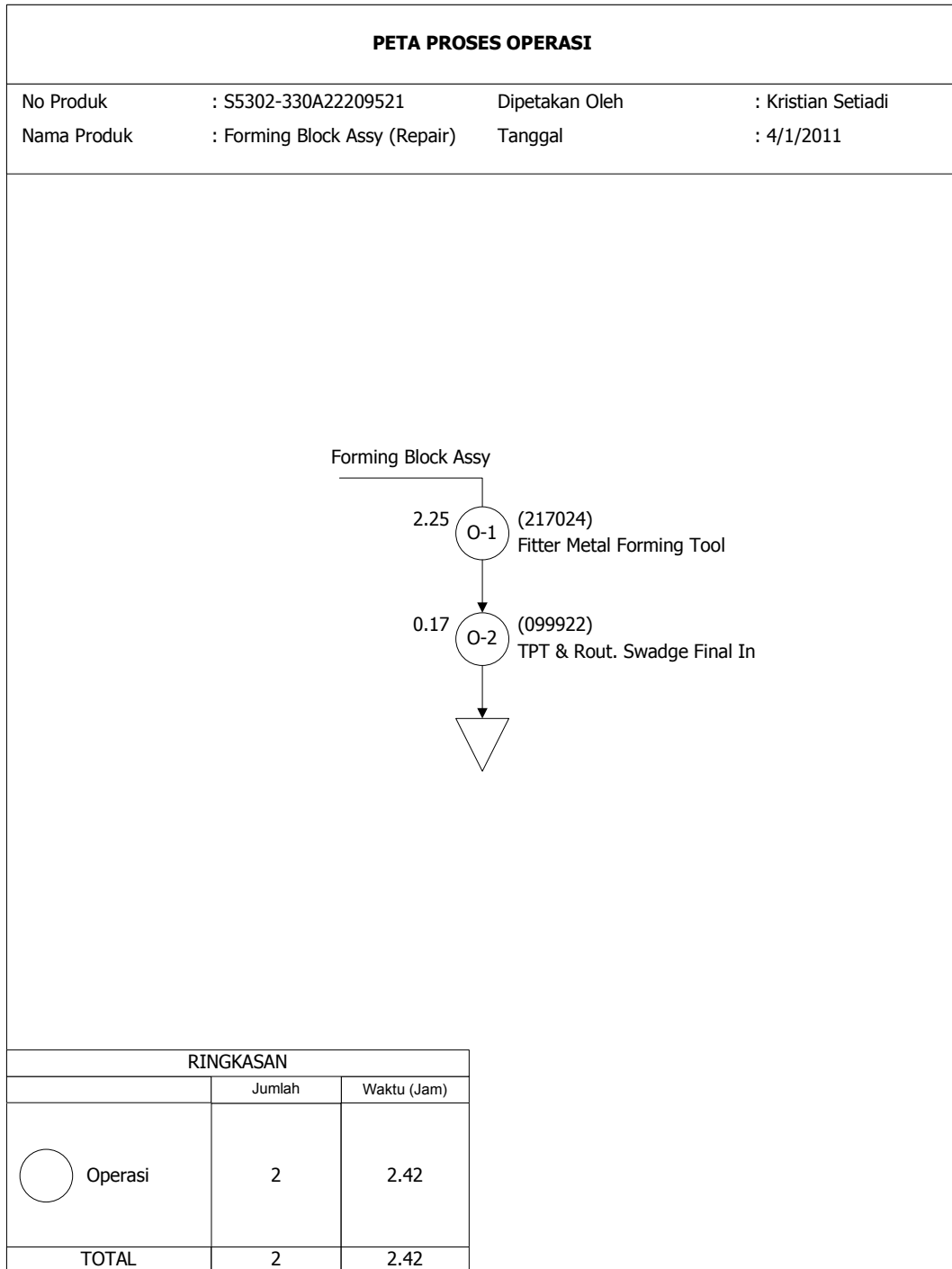


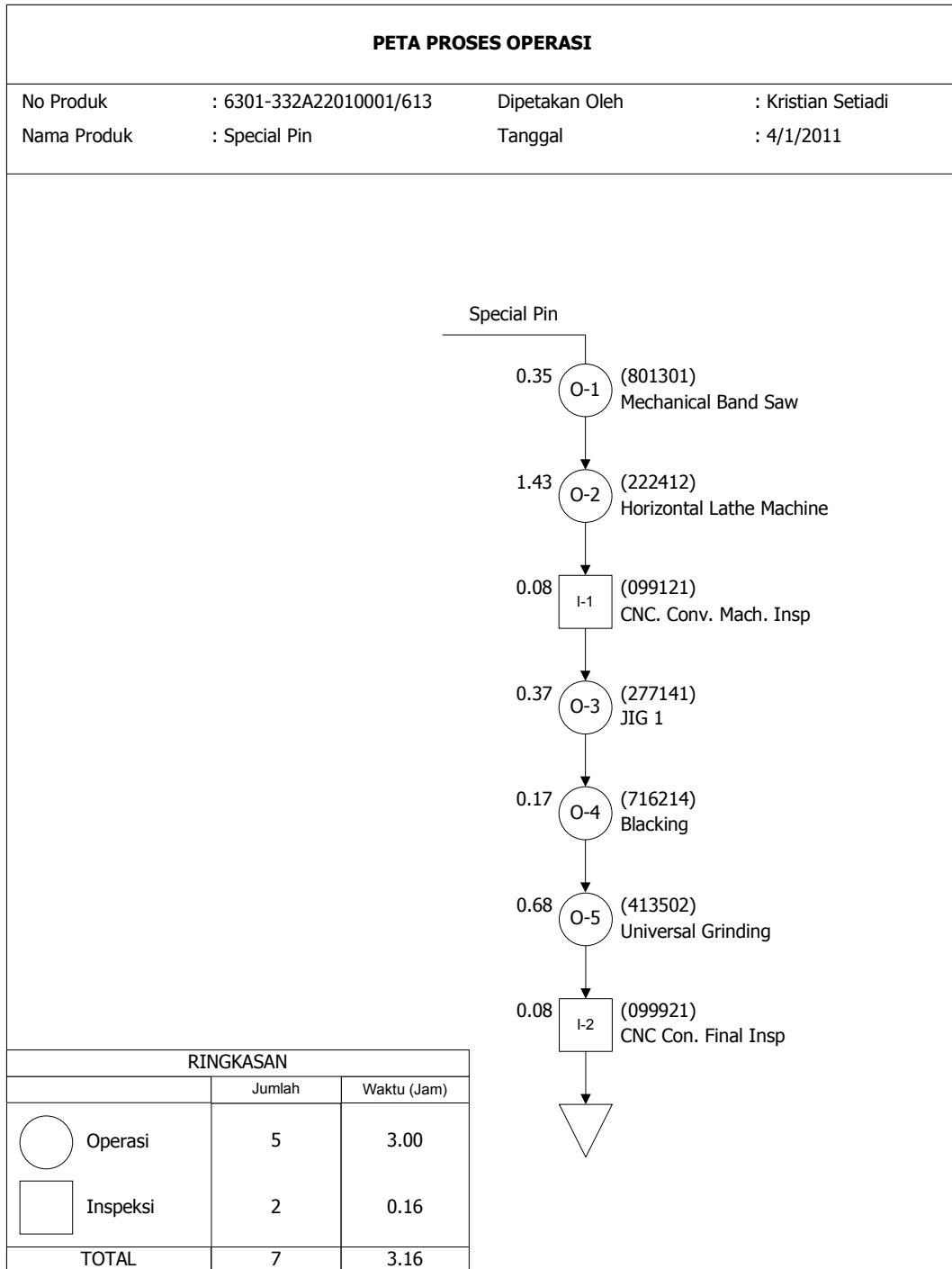


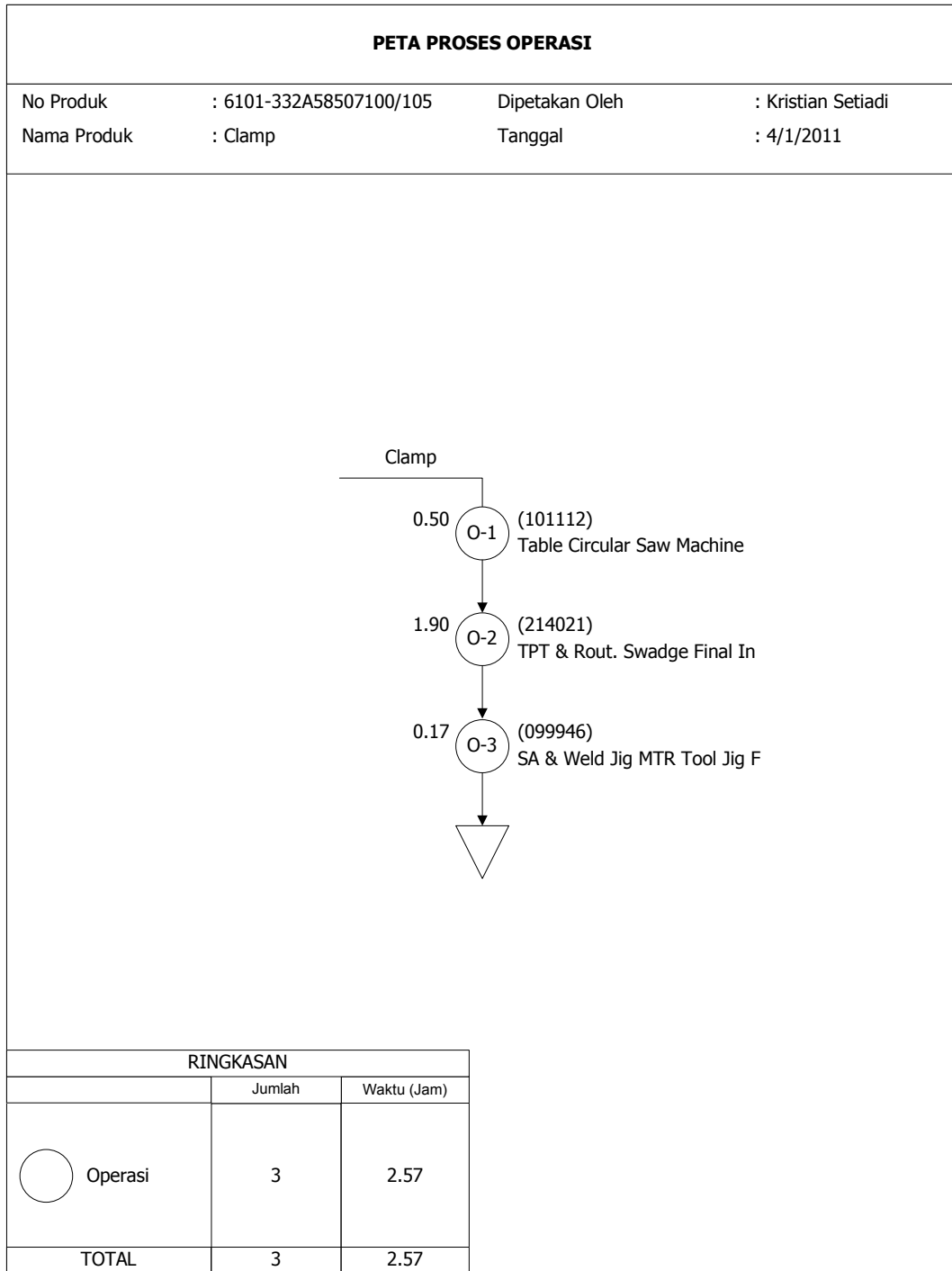


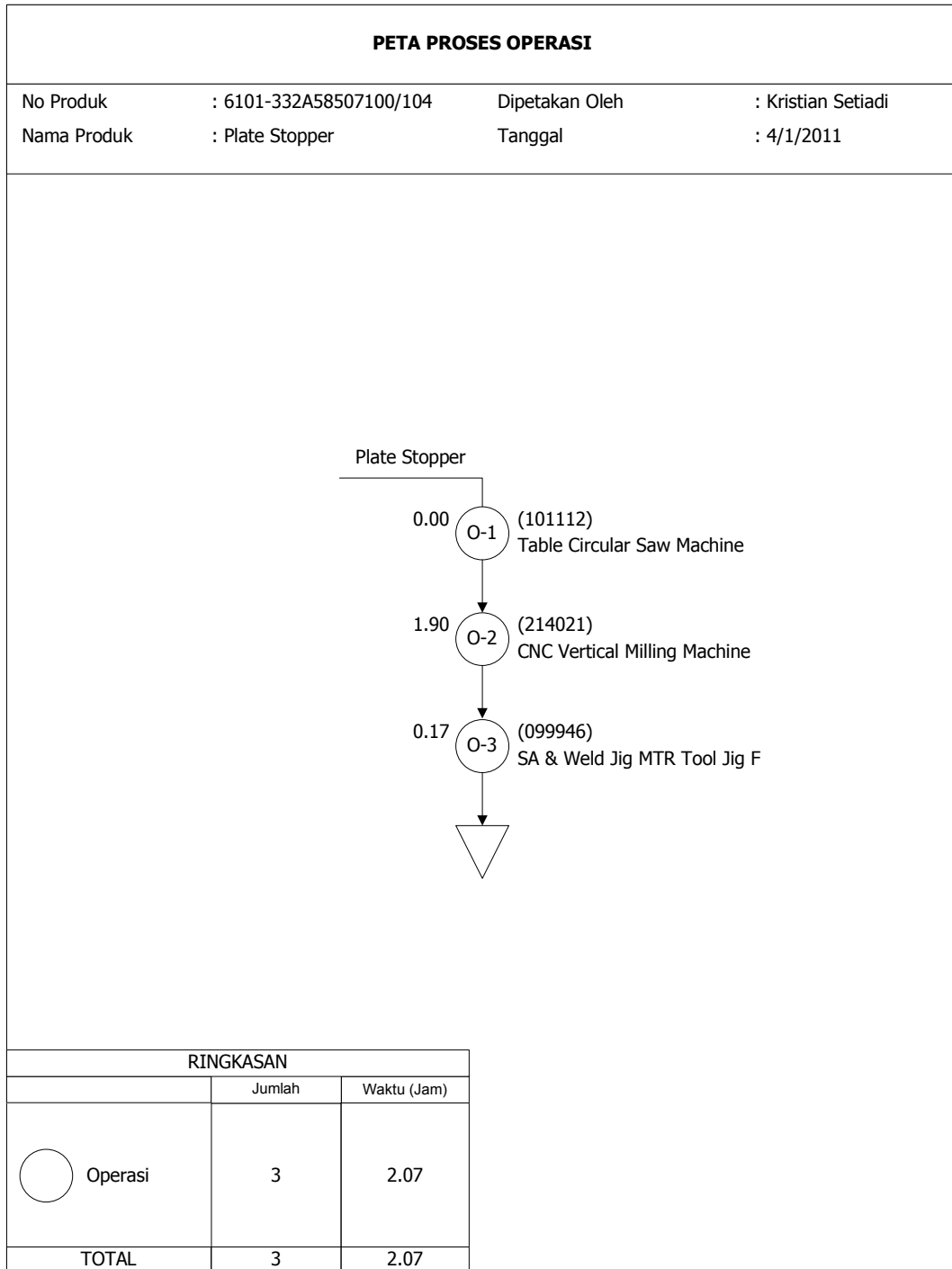


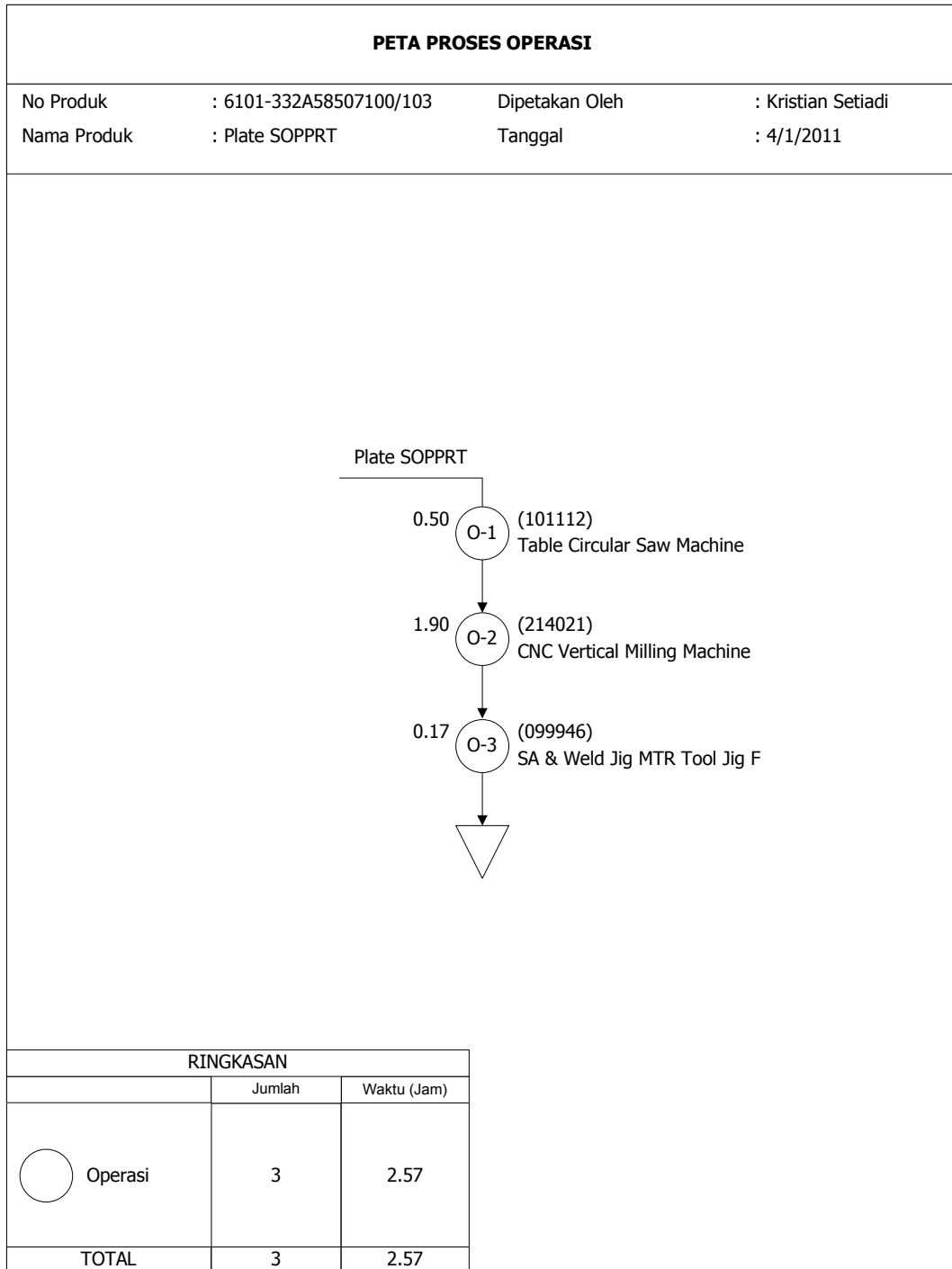


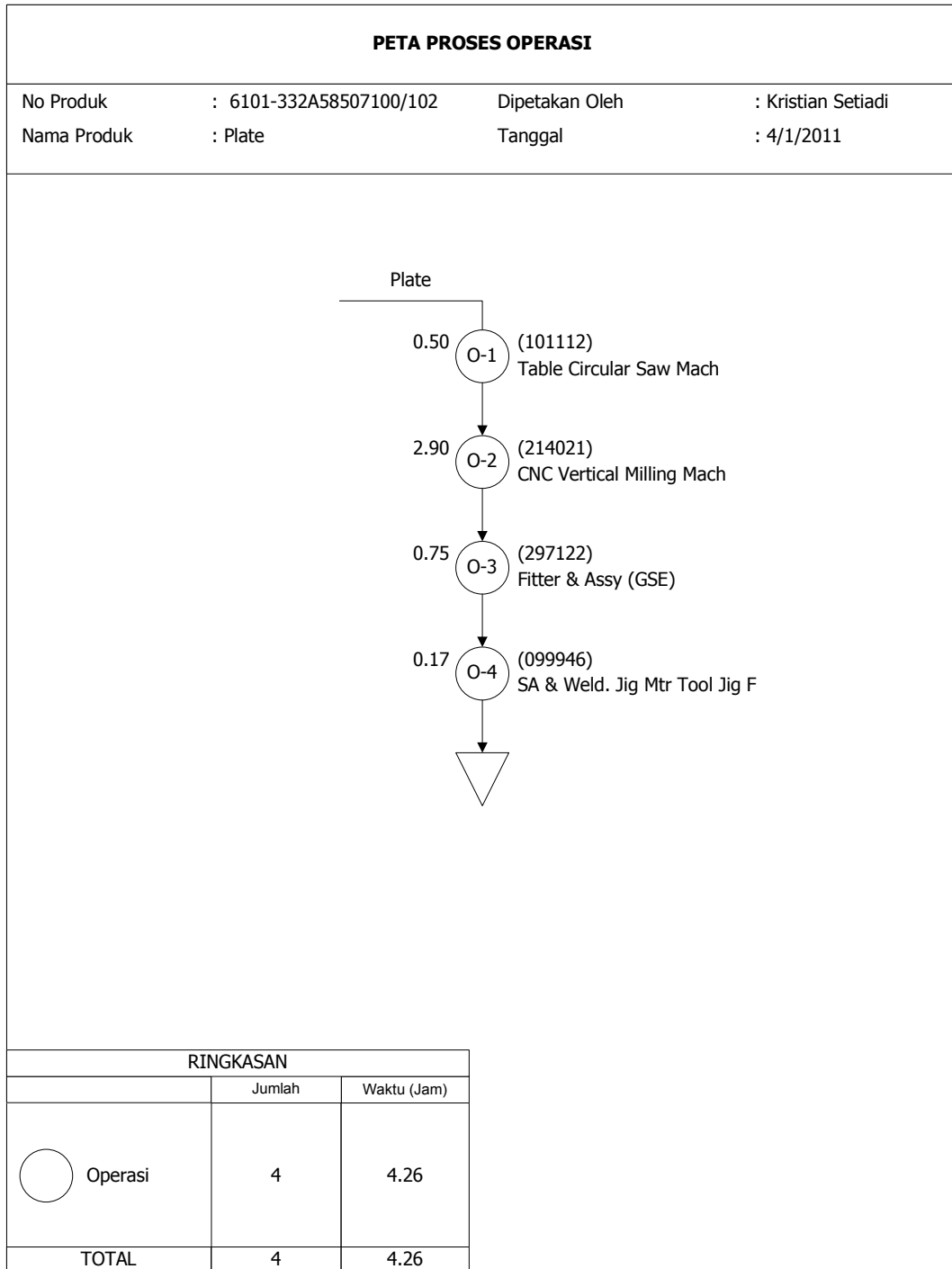


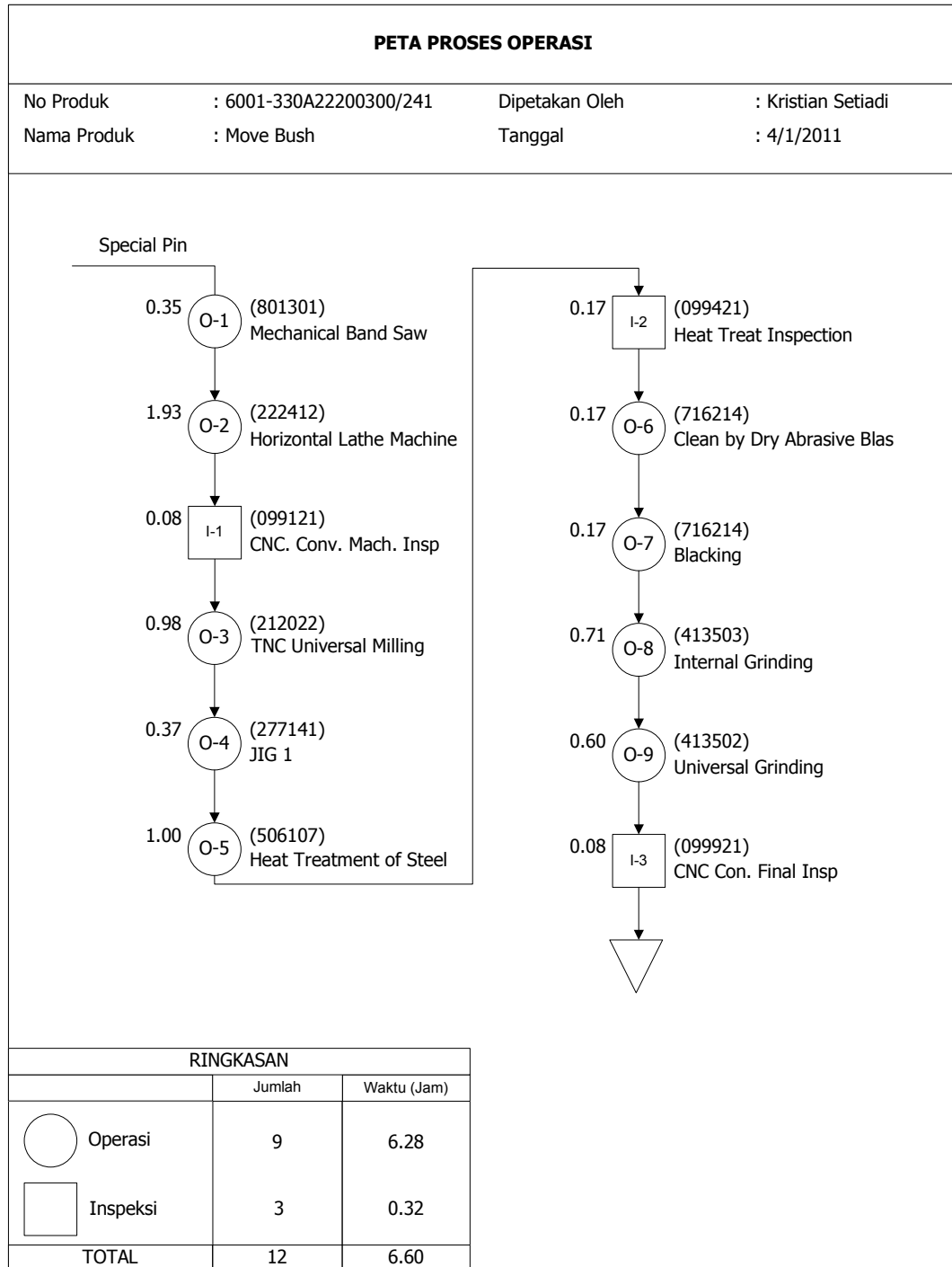












LAMPIRAN B
SOFTWARE

```
import javax.swing.DefaultCellEditor;
import javax.swing.JComboBox;
import javax.swing.JOptionPane;
import javax.swing.SpinnerModel;
import javax.swing.SpinnerNumberModel;
import javax.swing.table.DefaultTableModel;
import javax.swing.table.TableColumn;

public class MainFrame extends javax.swing.JFrame {

    DefaultTableModel model;
    DefaultTableModel modelMesin;
    DefaultTableModel modelFeromon;
    DefaultTableModel modelProbabilitas;
    int proses, job, mesin;
    int[] visit;
    String[] tabelProb = new String[]{"", "", "", "", "", ""};
    String[][] tabelProses;
    double[][] mfa;
    double[] makespan;

    public MainFrame() {
        initComponents();
        setLocationRelativeTo(null);
        jPanel1.setVisible(false);

        jTableProses.getSelectionModel();
        model = (DefaultTableModel) jTableProses.getModel();
        jTableMesin.getSelectionModel();
        modelMesin = (DefaultTableModel) jTableMesin.getModel();
        jTableFeromon.getSelectionModel();
        modelFeromon = (DefaultTableModel) jTableFeromon.getModel();
        jTableProbabilitas.getSelectionModel();
        modelProbabilitas = (DefaultTableModel) jTableProbabilitas.getModel();
    }

    public void printArray(String[][] array){
        for (int i = 0; i < array.length; i++) {
            for (int j = 0; j < array[i].length; j++) {
                JTextAreaResult.append(array[i][j]);
                if(j < array[i].length-1){
                    JTextAreaResult.append(",");
                }
            }
            JTextAreaResult.append("\n");
        }
        JTextAreaResult.append("\n");
    }
}
```



```

public String printArray(int[] array){
    String hasil = "";
    for (int i = 0; i < array.length; i++) {
        hasil += array[i];
        if(i < array.length-1){
            hasil += ",";
        }
    }
    //jTextAreaResult.append("prop1 = "+hasil+"\n");
    return hasil;
}

public String printArray(double[] array){
    String hasil = "";
    for (int i = 0; i < array.length; i++) {
        hasil += array[i];
        if(i < array.length-1){
            hasil += ",";
        }
    }
    //jTextAreaResult.append("prop2 = "+hasil+"\n");
    return hasil;
}

public double[] hitProp(int operation, int[] proses){
    //printArray(proses);
    double[] prop = new double[proses.length];
    double temp = 0;
    for (int i = 0; i < prop.length; i++) {
        if(proses[i]-1>=0){
            double temp1 = mfa[operation][proses[i]-
1]*Math.pow(1/Double.parseDouble(tabelProses[proses[i]-
1][2]),(Double)jSpinnerBeta.getValue());
            temp += temp1;
        }
    }
    for (int i = 0; i < prop.length; i++) {
        if(proses[i]-1>=0){
            double temp1 = mfa[operation][proses[i]-
1]*Math.pow(1/Double.parseDouble(tabelProses[proses[i]-
1][2]),(Double)jSpinnerBeta.getValue());
            prop[i] = Math.round(temp1/temp*1000);
            prop[i] = prop[i]/1000;
        }
    }
    return prop;
}

```

```

public int[] isiProb(){
    modelProbabilitas.getDataVector().removeAllElements();
    int[] urutanJob = new int[proses];
    String temp = "";
    int operation = 0;
    tabelProb[1]="0";
    tabelProb[2] = "";
    tabelProses = new String[proses][5];
    for (int i = 0; i < proses; i++) {
        for (int j = 0; j < 4; j++) {
            tabelProses[i][j] = jTableProses.getValueAt(i, j).toString();
        }
        tabelProses[i][4] = "0";
    }
    for (int n = 0; n < proses; n++) {
        tabelProb[0] = ""+(n+1);
        tabelProb[1] += temp+", ";
        int[] prop1 = new int[job];
        double[] prop2 = new double[job];
        for (int i = 0; i < job; i++) {
            prop1[i] = 0;
            prop2[i] = 0;
        }
        for (int o = 1; o <= job; o++) {
            // jTableAreaResult.append("job "+o+"\n");
            for (int i = 0; i < proses; i++) {
                if(tabelProses[i][3].equals(""+o)&&tabelProses[i][4].equals("0")){
                    for (int j = 0; j < job; j++) {
                        if(prop1[j]==0){
                            prop1[j] = Integer.parseInt(tabelProses[i][0]);
                            // jTableAreaResult.append("data o = "+o+" :
                            "+tabelProses[i][0]+",""+
                            //         tabelProses[i][1]+",""+
                            //         tabelProses[i][2]+",""+
                            //         tabelProses[i][3]+",""+
                            //         tabelProses[i][4]+".\n");
                            break;
                        }
                    }
                }
                break;
            }
        }
        tabelProb[2] = printArray(prop1);
        if(n!=0){
            operation = Integer.parseInt(jTableProbabilitas.getValueAt(n-1, 5).toString());
        }
    }
}

```

```

prop2 = hitProp(operation, prop1);
tabelProb[3] = printArray(prop2);
double rand = Math.round(Math.random()*1000);
rand /= 1000;

double chosen = prop2[0];
int idx = 0;
for (int i = 1; i < prop2.length; i++) {
    if(Math.abs(prop2[i]-rand) < Math.abs(chosen-rand) && prop2[i] != 0){
        chosen = prop2[i];
        idx = i;
    }
}
if(prop1[idx]>0){
    tabelProses[prop1[idx]-1][4] = "1";
}
tabelProb[4] = ""+rand;
tabelProb[5] = ""+prop1[idx];
temp = tabelProb[5];

String[] prob = tabelProb[2].split(",");

urutanJob[n] = Integer.parseInt(tabelProb[5]);
modelProbabilitas.addRow(new
Object[] {tabelProb[0],tabelProb[1]+"...",tabelProb[2],tabelProb[3],tabelProb[4],tabelPr
ob[5]});

jTextAreaResult.append(tabelProb[0]+"\\t"+tabelProb[1]+"..."+"\\t"+tabelProb[2]+"\\t"+ta
belProb[3]+"\\t"+tabelProb[4]+"\\t"+tabelProb[5]+"\\n");
}
jTextAreaResult.append("\\n");
int count = 0;
for(int n = 0; n < jTableMesin.getRowCount(); n++){
    count += (Integer)jTableMesin.getValueAt(n, 1);
}
makespan = new double[count];
//jTextAreaResult.append("Mesin = "+count+"\\n");
//jTextAreaResult.append("Urutan Job = \\n");
for (int n = 0; n < urutanJob.length; n++) {
    jTextAreaResult.append("job = "+urutanJob[n]+"\\n");
    for (int i = 0; i < proses; i++) {
        if(tabelProses[i][0].equalsIgnoreCase(""+urutanJob[n])){
            jTextAreaResult.append("runtime "+tabelProses[i][2]+"\\n");
            String job1 = "null";
            String mesin1 = "null";
            for (int j = 0; j < proses; j++) {
                if(tabelProses[j][3].equalsIgnoreCase(tabelProses[i][3])){
                    if(i==j){

```

```

        break;
    } else {
        job1 = tabelProses[j][0];
        mesin1 = tabelProses[j][1];
    }
}
jTextAreaResult.append("job-1 = "+job1+"\n");
jTextAreaResult.append("mesin job-1 = "+mesin1+"\n");
try{
    double rttemp = makespan[Integer.parseInt(mesin1)-1];
    jTextAreaResult.append("runtime mesin job-1 = "+rttemp+"\n");
    makespan[Integer.parseInt(tabelProses[i][1])-1] = rttemp +
Double.parseDouble(tabelProses[i][2]);
    jTextAreaResult.append("***runtime mesin-
"+Integer.parseInt(tabelProses[i][1])+" = "+rttemp+" + rt "+tabelProses[i][2)+"\n");
} catch(Exception e){
    makespan[Integer.parseInt(tabelProses[i][1])-1] +=
Double.parseDouble(tabelProses[i][2]);
    jTextAreaResult.append("***runtime mesin-
"+Integer.parseInt(tabelProses[i][1])+" + rt "+tabelProses[i][2)+"\n");
}
//1 mesin
for (int x = 0; x < makespan.length; x++) {
    jTextAreaResult.append("Mesin-"+(x+1)+" = "+makespan[x)+"\n");
}
}
jTextAreaResult.append("-----\n");
}
jTextAreaResult.append("\n");
for (int i = 0; i < makespan.length; i++) {
    jTextAreaResult.append("Mesin-"+(i+1)+" = "+makespan[i)+"\n");
}
}
return urutanJob;
}

public double[][] matriks_feromon_awal(int proses, double min_time){
    double x = 0;
    if(min_time>0){
        x = Math.round(1/(proses*min_time)*100);
        x = x/100;
    } else {
        JOptionPane.showMessageDialog(rootPane, "runtime tidak boleh kurang atau
sama dengan 0", "Error", JOptionPane.WARNING_MESSAGE);
    }
}

mfa = new double[proses+1][proses];

```

```

modelFeromon.getDataVector().removeAllElements();
for (int i = 0; i < mfa.length; i++) {
    for (int j = 0; j < mfa[i].length; j++) {
        if((i-1)!=j){
            mfa[i][j] = x;
        } else {
            mfa[i][j] = 0;
        }
    }
    Object[] obj = new Object[mfa[i].length+1];
    obj[0] = i;
    for (int j=0; j<mfa[i].length; j++){
        obj[j+1]=mfa[i][j];
    }
    modelFeromon.addRow(obj);
}

//print
for (int i = 0; i < mfa.length; i++) {

    for (int j = 0; j < mfa[i].length; j++) {
        jTextAreaResult.append(mfa[i][j]+" ");
    }
    jTextAreaResult.append("\n");
}
return mfa;
}

public void runTabelFeromon(){
    double min_time;
    min_time = Double.parseDouble(model.getValueAt(0, 2).toString());

    for (int i=1; i<proses; i++){
        double x = Double.parseDouble(model.getValueAt(i, 2).toString());
        if(x<min_time){
            min_time = x;
        }
    }
    //jTextAreaResult.append("min_time = "+min_time+"\n");
    matriks_feromon_awal(proses, min_time);
}

public void updateTabelFeromon(int[] urutanJob){
    double rho = (Double)jSpinnerRho.getValue();
    mfa[0][urutanJob[0]-1] = (1-rho)*mfa[0][urutanJob[0]-1]-
rho*mfa[0][urutanJob[0]-1];
    mfa[0][urutanJob[0]-1] = Math.round(mfa[0][urutanJob[0]-1]*100);
    mfa[0][urutanJob[0]-1] /= 100;
}

```

```

//jTextAreaResult.append("urutan job length = "+urutanJob.length+"\n");
for (int i = 0; i < urutanJob.length-1; i++) {
    //jTextAreaResult.append("i-"+i+" = "+urutanJob[i]+" "+urutanJob[i+1]+"");
    mfa[urutanJob[i]][urutanJob[i+1]-1] = (1-
rho)*mfa[urutanJob[i]][urutanJob[i+1]-1]-rho*mfa[urutanJob[i]][urutanJob[i+1]-
1];/???

    mfa[urutanJob[i]][urutanJob[i+1]-1] =
Math.round(mfa[urutanJob[i]][urutanJob[i+1]-1]*100);
    mfa[urutanJob[i]][urutanJob[i+1]-1] /= 100;
}
//print
for (int i = 0; i < mfa.length; i++) {

    for (int j = 0; j < mfa[i].length; j++) {
        jTextAreaResult.append(mfa[i][j]+" ");
    }
    jTextAreaResult.append("\n");
}
}

@SuppressWarnings("unchecked")
// <editor-fold defaultstate="collapsed" desc="Generated Code">
private void initComponents() {

    jDialogNew = new javax.swing.JDialog();
    jLabel1 = new javax.swing.JLabel();
    jLabel2 = new javax.swing.JLabel();
    SpinnerModel smproses = new SpinnerNumberModel(1, 1, 100, 1);
    jSpinnerJmlProses = new javax.swing.JSpinner(smproses);
    SpinnerModel smjob = new SpinnerNumberModel(1, 1, 100, 1);
    jSpinnerJmlJob = new javax.swing.JSpinner(smjob);
    jButtonNewOK = new javax.swing.JButton();
    jLabel3 = new javax.swing.JLabel();
    SpinnerModel smmesin = new SpinnerNumberModel(1, 1, 100, 1);
    jSpinnerJenisMesin = new javax.swing.JSpinner(smmesin);
    jDialogParameter = new javax.swing.JDialog();
    SpinnerModel smncmax = new SpinnerNumberModel(1, 1, 100, 1);
    jSpinnerNCMax = new javax.swing.JSpinner(smncmax);
    SpinnerModel smant = new SpinnerNumberModel(2, 1, 100, 1);
    jSpinnerAnt = new javax.swing.JSpinner(smant);
    SpinnerModel smrho = new SpinnerNumberModel(0.1, 0, 10, 0.1);
    jSpinnerRho = new javax.swing.JSpinner(smrho);
    SpinnerModel smbета = new SpinnerNumberModel(2, 0, 10, 0.1);
    jSpinnerBeta = new javax.swing.JSpinner(smbета);
    SpinnerModel smalpa = new SpinnerNumberModel(0.1, 0, 10, 0.1);
    jSpinnerAlpha = new javax.swing.JSpinner(smalpa);

```

```
jLabel9 = new javax.swing.JLabel();
jLabel7 = new javax.swing.JLabel();
jLabel6 = new javax.swing.JLabel();
jLabel5 = new javax.swing.JLabel();
jLabel4 = new javax.swing.JLabel();
jScrollPane2 = new javax.swing.JScrollPane();
jTableMesin = new javax.swing.JTable();
jButtonParameterOK = new javax.swing.JButton();
jDialogTabelProbabilitas = new javax.swing.JDialog();
jScrollPane3 = new javax.swing.JScrollPane();
jTableProbabilitas = new javax.swing.JTable();
jButtonTabelProbabilitasOK = new javax.swing.JButton();
jDialogTabelFeromon = new javax.swing.JDialog();
jScrollPane4 = new javax.swing.JScrollPane();
jTableFeromon = new javax.swing.JTable();
jButtonTabelFeromonOK = new javax.swing.JButton();
jDialogResult = new javax.swing.JDialog();
jScrollPane5 = new javax.swing.JScrollPane();
jTextAreaResult = new javax.swing.JTextArea();
jButtonResultOK = new javax.swing.JButton();
jPanel1 = new javax.swing.JPanel();
jScrollPane1 = new javax.swing.JScrollPane();
jTableProses = new javax.swing.JTable();
jMenuBar1 = new javax.swing.JMenuBar();
jMenu1 = new javax.swing.JMenu();
jMenuItemNew = new javax.swing.JMenuItem();
jMenuItemExit = new javax.swing.JMenuItem();
jMenu2 = new javax.swing.JMenu();
jMenuItemParameter = new javax.swing.JMenuItem();
jMenu3 = new javax.swing.JMenu();
jMenuItemMatriksFeromon = new javax.swing.JMenuItem();
jMenuItemTabelProbabilitas = new javax.swing.JMenuItem();
jMenu4 = new javax.swing.JMenu();
jMenuItemRun = new javax.swing.JMenuItem();

jDialogNew.setTitle("New");
jDialogNew.setBackground(java.awt.Color.white);

jDialogNew.setModalityType(java.awt.Dialog.ModalityType.APPLICATION_MODAL);

jLabel1.setText("Jumlah Job");

jLabel2.setText("Jumlah Proses");

jButtonNewOK.setText("OK");
jButtonNewOK.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
```

```

        jButtonNewOKActionPerformed(evt);
    }
});

jLabel3.setText("Jenis Mesin");

javax.swing.GroupLayout jDialogNewLayout = new
javax.swing.GroupLayout(jDialogNew.getContentPane());
jDialogNew.getContentPane().setLayout(jDialogNewLayout);
jDialogNewLayout.setHorizontalGroup(

jDialogNewLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
    .addGroup(jDialogNewLayout.createSequentialGroup()
        .addGap(10, 10, 10)
        .addGroup(jDialogNewLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jDialogNewLayout.createSequentialGroup()
                .addGap(10, 10, 10)
                .addGroup(jDialogNewLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                    .addComponent(jLabel2)
                    .addComponent(jLabel1)
                    .addComponent(jLabel3))
                .addPreferredGap(LayoutStyle.ComponentPlacement.UNRELATED)
                .addGroup(jDialogNewLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                    .addComponent(jSpinnerJenisMesin)
                    .addComponent(jSpinnerJmlProses)
                    .addComponent(jSpinnerJmlJob,
                        javax.swing.GroupLayout.DEFAULT_SIZE, 45, Short.MAX_VALUE))
                .addGroup(jDialogNewLayout.createSequentialGroup()
                    .addComponent(jButtonNewOK,
                        javax.swing.GroupLayout.PREFERRED_SIZE, 77,
                        javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addGap(127, 127, 127))
            )
        )
    )
);
jDialogNewLayout.setVerticalGroup(

jDialogNewLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
    .addGroup(jDialogNewLayout.createSequentialGroup()
        .addGap(10, 10, 10)
        .addGroup(jDialogNewLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
            .addComponent(jLabel1)
            .addComponent(jSpinnerJmlJob,
                javax.swing.GroupLayout.PREFERRED_SIZE,

```



```

javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
    .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED
)
    .addGroup(jDialogNewLayout.createParallelGroup(javax.swing.GroupLayout
.Alignment.BASELINE)
        .addComponent(jLabel2)
        .addComponent(jSpinnerJmlProses,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED
)
        .addGroup(jDialogNewLayout.createParallelGroup(javax.swing.GroupLayout
.Alignment.BASELINE)
            .addComponent(jLabel3)
            .addComponent(jSpinnerJenisMesin,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
            .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED,
31, Short.MAX_VALUE)
            .addComponent(jButtonNewOK)
            .addContainerGap()
        );

jDialogParameter.setTitle("Parameter");

jDialogParameter.setModalityType(java.awt.Dialog.ModalityType.APPLICATION_M
ODAL);

jLabel9.setText("NCMax");

jLabel7.setText("a");

jLabel6.setText("rho");

jLabel5.setText("beta");

jLabel4.setText("alpha");

jTableMesin.setModel(new javax.swing.table.DefaultTableModel(
    new Object [][] {
        },
        new String [] {
            "Jenis Mesin", "Jumlah Mesin"
        }
    )

```

```

) {
    Class[] types = new Class [] {
        java.lang.Object.class, java.lang.Integer.class
    };
    boolean[] canEdit = new boolean [] {
        false, true
    };

    public Class getColumnClass(int columnIndex) {
        return types [columnIndex];
    }

    public boolean isCellEditable(int rowIndex, int columnIndex) {
        return canEdit [columnIndex];
    }
});
jTableMesin.getTableHeader().setReorderingAllowed(false);
jScrollPane2.setViewportViewView(jTableMesin);

jButtonParameterOK.setText("OK");
jButtonParameterOK.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jButtonParameterOKActionPerformed(evt);
    }
});

javax.swing.GroupLayout jDialogParameterLayout = new
javax.swing.GroupLayout(jDialogParameter.getContentPane());
jDialogParameter.getContentPane().setLayout(jDialogParameterLayout);
jDialogParameterLayout.setHorizontalGroup(

jDialogParameterLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
    .addGroup(jDialogParameterLayout.createSequentialGroup()
        .add(jDialogParameterLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .add(jDialogParameterLayout.createSequentialGroup()
                .add(jLabel9)
                .add(jLabel6)
                .add(jLabel5)
                .add(jLabel4)
                .add(jLabel7)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                .add(jDialogParameterLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                    .add(jSpinnerNCMax)
                    .add(jSpinnerAnt)
                    .add(jSpinnerRho)
                )
            )
        )
    )

```

```

        .addComponent(jSpinnerBeta)
        .addComponent(jSpinnerAlpha,
javafx.swing.GroupLayout.DEFAULT_SIZE, 45, Short.MAX_VALUE))
        .addGap(18, 18, 18)
        .addComponent(jScrollPane2, javafx.swing.GroupLayout.PREFERRED_SIZE,
229, javafx.swing.GroupLayout.PREFERRED_SIZE)
        .addContainerGap(javafx.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
        .addGroup(javafx.swing.GroupLayout.Alignment.TRAILING,
jDialogParameterLayout.createSequentialGroup())
        .addContainerGap(307, Short.MAX_VALUE)
        .addComponent(jButtonParameterOK)
        .addContainerGap()
    );
    jDialogParameterLayout.setVerticalGroup(

jDialogParameterLayout.createParallelGroup(javafx.swing.GroupLayout.Alignment.LE
ADING)
        .addGroup(jDialogParameterLayout.createSequentialGroup())
        .addContainerGap()
        .addGroup(jDialogParameterLayout.createParallelGroup(javafx.swing.GroupL
ayout.Alignment.TRAILING, false)
        .addComponent(jScrollPane2,
javafx.swing.GroupLayout.Alignment.LEADING, 0, 0, Short.MAX_VALUE)
        .addGroup(javafx.swing.GroupLayout.Alignment.LEADING,
jDialogParameterLayout.createSequentialGroup())
        .addGroup(jDialogParameterLayout.createParallelGroup(javafx.swing.Gr
oupLayout.Alignment.BASELINE)
        .addComponent(jLabel4)
        .addComponent(jSpinnerAlpha,
javafx.swing.GroupLayout.PREFERRED_SIZE,
javafx.swing.GroupLayout.DEFAULT_SIZE,
javafx.swing.GroupLayout.PREFERRED_SIZE))
        .addPreferredGap(javafx.swing.LayoutStyle.ComponentPlacement.RELA
TED)
        .addGroup(jDialogParameterLayout.createParallelGroup(javafx.swing.Gr
oupLayout.Alignment.BASELINE)
        .addComponent(jLabel5)
        .addComponent(jSpinnerBeta,
javafx.swing.GroupLayout.PREFERRED_SIZE,
javafx.swing.GroupLayout.DEFAULT_SIZE,
javafx.swing.GroupLayout.PREFERRED_SIZE))
        .addPreferredGap(javafx.swing.LayoutStyle.ComponentPlacement.RELA
TED)
        .addGroup(jDialogParameterLayout.createParallelGroup(javafx.swing.Gr
oupLayout.Alignment.BASELINE)
        .addComponent(jLabel6)

```

```

        .addComponent(jSpinnerRho,
javafx.swing.GroupLayout.PREFERRED_SIZE,
javafx.swing.GroupLayout.DEFAULT_SIZE,
javafx.swing.GroupLayout.PREFERRED_SIZE))
        .addPreferredGap(javafx.swing.LayoutStyle.ComponentPlacement.RELA
TED)
        .addGroup(jDialogParameterLayout.createParallelGroup(javafx.swing.Gr
oupLayout.Alignment.BASELINE)
        .addComponent(jLabel7)
        .addComponent(jSpinnerAnt,
javafx.swing.GroupLayout.PREFERRED_SIZE,
javafx.swing.GroupLayout.DEFAULT_SIZE,
javafx.swing.GroupLayout.PREFERRED_SIZE))
        .addPreferredGap(javafx.swing.LayoutStyle.ComponentPlacement.RELA
TED)
        .addGroup(jDialogParameterLayout.createParallelGroup(javafx.swing.Gr
oupLayout.Alignment.BASELINE)
        .addComponent(jLabel9)
        .addComponent(jSpinnerNCMax,
javafx.swing.GroupLayout.PREFERRED_SIZE,
javafx.swing.GroupLayout.DEFAULT_SIZE,
javafx.swing.GroupLayout.PREFERRED_SIZE))))
        .addPreferredGap(javafx.swing.LayoutStyle.ComponentPlacement.RELATED,
8, Short.MAX_VALUE)
        .addComponent(jButtonParameterOK)
        .addContainerGap()
    );

    jDialogTabelProbabilitas.setTitle("Tabel Probabilitas");

jDialogTabelProbabilitas.setModalityType(java.awt.Dialog.ModalityType.APPLICATI
ON_MODAL);

    jTableProbabilitas.setModel(new javafx.swing.table.DefaultTableModel(
        new Object [][] {

        },
        new String [] {
            "No", "Tabu", "Omega", "Probabilitas", "Bil Random", "Operasi yg
dijadwalkan"
        }
    ) {
        Class[] types = new Class [] {
            java.lang.Integer.class, java.lang.Object.class, java.lang.Object.class,
java.lang.Object.class, java.lang.Object.class, java.lang.Object.class
        };

        public Class getColumnClass(int columnIndex) {

```

```

        return types [columnIndex];
    }
});
jTableProbabilitas.getTableHeader().setReorderingAllowed(false);
jScrollPane3.setViewportView(jTableProbabilitas);
jTableProbabilitas.getColumnModel().getColumn(0).setPreferredWidth(2);
jTableProbabilitas.getColumnModel().getColumn(1).setPreferredWidth(100);
jTableProbabilitas.getColumnModel().getColumn(2).setPreferredWidth(15);
jTableProbabilitas.getColumnModel().getColumn(3).setPreferredWidth(90);
jTableProbabilitas.getColumnModel().getColumn(4).setPreferredWidth(40);
jTableProbabilitas.getColumnModel().getColumn(5).setResizable(false);
jTableProbabilitas.getColumnModel().getColumn(5).setPreferredWidth(120);

jButtonTabelProbabilitasOK.setText("OK");
jButtonTabelProbabilitasOK.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jButtonTabelProbabilitasOKActionPerformed(evt);
    }
});

javax.swing.GroupLayout jDialogTabelProbabilitasLayout = new
javax.swing.GroupLayout(jDialogTabelProbabilitas.getContentPane());

jDialogTabelProbabilitas.getContentPane().setLayout(jDialogTabelProbabilitasLayout);
jDialogTabelProbabilitasLayout.setHorizontalGroup(

jDialogTabelProbabilitasLayout.createParallelGroup(javax.swing.GroupLayout.Alignm
ent.LEADING)
    .addGroup(jDialogTabelProbabilitasLayout.createSequentialGroup()
        .addGroup(jDialogTabelProbabilitasLayout.createParallelGroup(
javax.swing.
GroupLayout.Alignment.LEADING)
            .addComponent(jScrollPane3, javax.swing.GroupLayout.DEFAULT_SIZE,
543, Short.MAX_VALUE)
            .addComponent(jButtonTabelProbabilitasOK,
javax.swing.GroupLayout.Alignment.TRAILING))
        .addGap(10, 10, 10)
    );
jDialogTabelProbabilitasLayout.setVerticalGroup(

jDialogTabelProbabilitasLayout.createParallelGroup(javax.swing.GroupLayout.Alignm
ent.LEADING)
    .addGroup(jDialogTabelProbabilitasLayout.createSequentialGroup()
        .addComponent(jScrollPane3, javax.swing.GroupLayout.PREFERRED_SIZE,
348, javax.swing.GroupLayout.PREFERRED_SIZE)

```

```

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED
    )
        .addComponent(jButtonTabelProbabilitasOK)
        .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
    );

    jDialogTabelFeromon.setTitle("Tabel Feromon");

jDialogTabelFeromon.setModalityType(java.awt.Dialog.ModalityType.APPLICATION
_MODAL);

    jTableFeromon.setModel(new javax.swing.table.DefaultTableModel(
        new Object [][] {

            },
            new String [] {
                "Pheromone"
            }
        ));
    jTableFeromon.getTableHeader().setReorderingAllowed(false);
    jScrollPane4.setViewportView(jTableFeromon);

    jButtonTabelFeromonOK.setText("OK");
    jButtonTabelFeromonOK.addActionListener(new java.awt.event.ActionListener()
    {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            jButtonTabelFeromonOKActionPerformed(evt);
        }
    });

    javax.swing.GroupLayout jDialogTabelFeromonLayout = new
javax.swing.GroupLayout(jDialogTabelFeromon.getContentPane());
    jDialogTabelFeromon.getContentPane().setLayout(jDialogTabelFeromonLayout);
    jDialogTabelFeromonLayout.setHorizontalGroup(

jDialogTabelFeromonLayout.createParallelGroup(javax.swing.GroupLayout.Alignment
.LEADING)
        .addGroup(jDialogTabelFeromonLayout.createSequentialGroup()
            .addGroup(jDialogTabelFeromonLayout.createParallelGroup(javax.swing. Gr
oupLayout.Alignment.LEADING)
                .addComponent(jScrollPane4, javax.swing.GroupLayout.DEFAULT_SIZE,
543, Short.MAX_VALUE)
                .addComponent(jButtonTabelFeromonOK,
javax.swing.GroupLayout.Alignment.TRAILING))
            .addGap(0, 0, Short.MAX_VALUE))
    );

```

```
jDialogTabelFeromonLayout.setVerticalGroup(

jDialogTabelFeromonLayout.createParallelGroup(javax.swing.GroupLayout.Alignment
.LEADING)
    .addGroup(jDialogTabelFeromonLayout.createSequentialGroup()
        .addContainerGap()
        .addComponent(jScrollPane4, javax.swing.GroupLayout.PREFERRED_SIZE,
348, javax.swing.GroupLayout.PREFERRED_SIZE)
        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED
)
        .addComponent(jButtonTabelFeromonOK)
        .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
    );

jDialogResult.setTitle("Result");

jDialogResult.setModalityType(java.awt.Dialog.ModalityType.APPLICATION_MODAL);

jTextAreaResult.setColumns(20);
jTextAreaResult.setRows(5);
jScrollPane5.setViewportView(jTextAreaResult);

jButtonResultOK.setText("OK");
jButtonResultOK.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jButtonResultOKActionPerformed(evt);
    }
});

javax.swing.GroupLayout jDialogResultLayout = new
javax.swing.GroupLayout(jDialogResult.getContentPane());
jDialogResult.getContentPane().setLayout(jDialogResultLayout);
jDialogResultLayout.setHorizontalGroup(

jDialogResultLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
    .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
jDialogResultLayout.createSequentialGroup()
        .addContainerGap()
        .addGroup(jDialogResultLayout.createParallelGroup(javax.swing.GroupLayout
.Alignment.TRAILING)
            .addComponent(jScrollPane5,
javax.swing.GroupLayout.Alignment.LEADING,
javax.swing.GroupLayout.DEFAULT_SIZE, 380, Short.MAX_VALUE)
            .addComponent(jButtonResultOK))
        .addContainerGap())
```

```

);
jDialogResultLayout.setVerticalGroup(

jDialogResultLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
    .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
jDialogResultLayout.createSequentialGroup()
    .addContainerGap()
    .addComponent(jScrollPane5, javax.swing.GroupLayout.DEFAULT_SIZE,
250, Short.MAX_VALUE)
    .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED
)
    .addComponent(jButtonResultOK)
    .addContainerGap()
);

setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
setTitle("ACS");

jTableProses.setModel(new javax.swing.table.DefaultTableModel(
    new Object [][] {

        },
    new String [] {
        "Proses", "Mesin", "Run Time", "Job"
    }
) {
    Class[] types = new Class [] {
        java.lang.Integer.class, java.lang.Integer.class, java.lang.Double.class,
java.lang.Object.class
    };
    boolean[] canEdit = new boolean [] {
        false, true, true, true
    };

    public Class getColumnClass(int columnIndex) {
        return types [columnIndex];
    }

    public boolean isCellEditable(int rowIndex, int columnIndex) {
        return canEdit [columnIndex];
    }
});
jTableProses.getTableHeader().setReorderingAllowed(false);
jScrollPane1.setViewportView(jTableProses);

javax.swing.GroupLayout jPanel1Layout = new
javax.swing.GroupLayout(jPanel1);

```



```
jPanel1.setLayout(jPanel1Layout);
jPanel1Layout.setHorizontalGroup(

jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
    .addGroup(jPanel1Layout.createSequentialGroup()
        .addContainerGap()
        .addComponent(jScrollPane1, javax.swing.GroupLayout.DEFAULT_SIZE,
579, Short.MAX_VALUE)
        .addContainerGap())
    );
jPanel1Layout.setVerticalGroup(

jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
    .addGroup(jPanel1Layout.createSequentialGroup()
        .addContainerGap()
        .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE,
280, javax.swing.GroupLayout.PREFERRED_SIZE)
        .addContainerGap(83, Short.MAX_VALUE))
    );

jMenu1.setText("File");

jMenuItemNew.setText("New");
jMenuItemNew.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jMenuItemNewActionPerformed(evt);
    }
});
jMenu1.add(jMenuItemNew);

jMenuItemExit.setText("Exit");
jMenuItemExit.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jMenuItemExitActionPerformed(evt);
    }
});
jMenu1.add(jMenuItemExit);

jMenuBar1.add(jMenu1);

jMenu2.setText("Edit");

jMenuItemParameter.setText("Parameter");
jMenuItemParameter.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jMenuItemParameterActionPerformed(evt);
    }
});
```

```
jMenu2.add(jMenuItemParameter);

jMenuBar1.add(jMenu2);

jMenu3.setText("View");

jMenuItemMatriksFeromon.setText("Matriks Feromon");
jMenuItemMatriksFeromon.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jMenuItemMatriksFeromonActionPerformed(evt);
    }
});
jMenu3.add(jMenuItemMatriksFeromon);

jMenuItemTabelProbabilitas.setText("Tabel Probabilitas");
jMenuItemTabelProbabilitas.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jMenuItemTabelProbabilitasActionPerformed(evt);
    }
});
jMenu3.add(jMenuItemTabelProbabilitas);

jMenuBar1.add(jMenu3);

jMenu4.setText("Run");

jMenuItemRun.setText("Run");
jMenuItemRun.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        jMenuItemRunActionPerformed(evt);
    }
});
jMenu4.add(jMenuItemRun);

jMenuBar1.add(jMenu4);

setJMenuBar(jMenuBar1);

javax.swing.GroupLayout layout = new
javax.swing.GroupLayout(getContentPane());
getContentPane().setLayout(layout);
layout.setHorizontalGroup(
    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
);
```

```

        layout.setVerticalGroup(
            layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE,
                    javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );

        pack();
    }// </editor-fold>

    private void jMenuItemNewActionPerformed(java.awt.event.ActionEvent evt) {
        jDialogNew.pack();
        jDialogNew.setLocationRelativeTo(this);
        jDialogNew.setVisible(true);
    }

    private void jButtonNewOKActionPerformed(java.awt.event.ActionEvent evt) {
        jDialogNew.setVisible(false);
        jPanel1.setVisible(true);
        proses = Integer.parseInt(jSpinnerJmlProses.getValue().toString());
        job = Integer.parseInt(jSpinnerJmlJob.getValue().toString());
        mesin = Integer.parseInt(jSpinnerJenisMesin.getValue().toString());

        Object ObjectJob[] = new Object[job];
        for (int i=1; i<=job; i++){
            ObjectJob[i-1]=i;
        }
        JComboBox cbJob = new JComboBox(ObjectJob);

        Object ObjectMesin[] = new Object[mesin];
        for (int i=1; i<=mesin; i++){
            ObjectMesin[i-1]=i;
        }
        JComboBox cbMesin = new JComboBox(ObjectMesin);

        model.getDataVector().removeAllElements();
        for (int i=1; i<=proses; i++){
            model.addRow(new Object[]{i,1,null,1});
            TableColumn jobColumn = jTableProses.getColumnModel().getColumn(3);
            jobColumn.setCellEditor(new DefaultCellEditor(cbJob));
            TableColumn mesinColumn = jTableProses.getColumnModel().getColumn(1);
            mesinColumn.setCellEditor(new DefaultCellEditor(cbMesin));
        }

        modelMesin.getDataVector().removeAllElements();
        for (int i=1; i<=mesin; i++){
            modelMesin.addRow(new Object[]{i,1});
        }
    }

```

```

        modelFeromon.getDataVector().removeAllElements();
        modelFeromon.setColumnCount(1);
        for (int i=1; i<=proses; i++){
            modelFeromon.addColumn(""+i);
        }

        visit = new int[proses];
    }

    private void jMenuItemParameterActionPerformed(java.awt.event.ActionEvent evt)
    {
        if(proses>0){
            jDialogParameter.pack();
            jDialogParameter.setLocationRelativeTo(this);
            jDialogParameter.setVisible(true);
        }
    }

    private void jMenuItemExitActionPerformed(java.awt.event.ActionEvent evt) {
        System.exit(0);
    }

    private void
    jMenuItemTabelProbabilitasActionPerformed(java.awt.event.ActionEvent evt) {
        if(tabelProses!=null){
            jDialogTabelProbabilitas.pack();
            jDialogTabelProbabilitas.setLocationRelativeTo(this);
            jDialogTabelProbabilitas.setVisible(true);
        } else if(proses>0){
            JOptionPane.showMessageDialog(rootPane, "Lakukan Run terlebih dahulu",
            "Error", JOptionPane.WARNING_MESSAGE);
        }
    }

    private void
    jButtonTabelProbabilitasOKActionPerformed(java.awt.event.ActionEvent evt) {
        jDialogTabelProbabilitas.setVisible(false);
    }

    private void jButtonParameterOKActionPerformed(java.awt.event.ActionEvent evt)
    {
        jDialogParameter.setVisible(false);
    }

    private void
    jMenuItemMatriksFeromonActionPerformed(java.awt.event.ActionEvent evt) {
        if(tabelProses!=null){

```

```

        jDialogTabelFeromon.pack();
        jDialogTabelFeromon.setLocationRelativeTo(this);
        jDialogTabelFeromon.setVisible(true);
    } else if(proses>0){
        JOptionPane.showMessageDialog(rootPane, "Lakukan Run terlebih dahulu",
"Error", JOptionPane.WARNING_MESSAGE);
    }
}

private void jButtonTabelFeromonOKActionPerformed(java.awt.event.ActionEvent
evt) {
    jDialogTabelFeromon.setVisible(false);
}

private void jMenuItemRunActionPerformed(java.awt.event.ActionEvent evt) {
//    try{
        jTextAreaResult.setText("");
        jTextAreaResult.append("Parameter\n");
        jTextAreaResult.append("-----\n");
        jTextAreaResult.append("alpha = "+jSpinnerAlpha.getValue()+"\n");
        jTextAreaResult.append("beta = "+jSpinnerBeta.getValue()+"\n");
        jTextAreaResult.append("rho = "+jSpinnerRho.getValue()+"\n");
        jTextAreaResult.append("ant = "+jSpinnerAnt.getValue()+"\n");
        jTextAreaResult.append("NCMax = "+jSpinnerNCMax.getValue()+"\n");
        jTextAreaResult.append("\n");
        jTextAreaResult.append("Matriks Feromon Awal\n");
        jTextAreaResult.append("-----\n");
        runTabelFeromon();
        jTextAreaResult.append("\n");
        for (int i = 0; i < (Integer)jSpinnerAnt.getValue(); i++) {
            jTextAreaResult.append("Tabel Probabilitas Semut "+(i+1)+"\n");
            jTextAreaResult.append("-----\n");
            int[] urutanJob = isiProb();
            jTextAreaResult.append("\n");
            jTextAreaResult.append("Local Pheromone Update Semut "+(i+1)+"\n");
            jTextAreaResult.append("-----\n");
            updateTabelFeromon(urutanJob);
            jTextAreaResult.append("\n");
        }
        jTextAreaResult.append("Global Pheromone Update NC 1\n");
        jTextAreaResult.append("-----\n");
        runTabelFeromon();
        jTextAreaResult.append("\n");
        //JOptionPane.showMessageDialog(rootPane, "Run ACS Completed", "Run",
JOptionPane.INFORMATION_MESSAGE);
        jDialogResult.pack();
        jDialogResult.setLocationRelativeTo(this);
        jDialogResult.setVisible(true);
    }
}

```

```
//    } catch(Exception e) {
//        if(proses>0){
//            JOptionPane.showMessageDialog(rootPane, "Isi Runtime terlebih dahulu",
//            "Error", JOptionPane.WARNING_MESSAGE);
//        }
//    }
//    }
}

private void jButtonResultOKActionPerformed(java.awt.event.ActionEvent evt) {
    jDialogResult.setVisible(false);
}

public static void main(String args[]) {
    java.awt.EventQueue.invokeLater(new Runnable() {
        public void run() {
            new MainFrame().setVisible(true);
        }
    });
}

// Variables declaration - do not modify
private javax.swing.JButton jButtonNewOK;
private javax.swing.JButton jButtonParameterOK;
private javax.swing.JButton jButtonResultOK;
private javax.swing.JButton jButtonTabelFeromonOK;
private javax.swing.JButton jButtonTabelProbabilitasOK;
private javax.swing.JDialog jDialogNew;
private javax.swing.JDialog jDialogParameter;
private javax.swing.JDialog jDialogResult;
private javax.swing.JDialog jDialogTabelFeromon;
private javax.swing.JDialog jDialogTabelProbabilitas;
private javax.swing.JLabel jLabel1;
private javax.swing.JLabel jLabel2;
private javax.swing.JLabel jLabel3;
private javax.swing.JLabel jLabel4;
private javax.swing.JLabel jLabel5;
private javax.swing.JLabel jLabel6;
private javax.swing.JLabel jLabel7;
private javax.swing.JLabel jLabel9;
private javax.swing.JMenu jMenuItem1;
private javax.swing.JMenu jMenuItem2;
private javax.swing.JMenu jMenuItem3;
private javax.swing.JMenu jMenuItem4;
private javax.swing.JMenuBar jMenuItemBar1;
private javax.swing.JMenuItem jMenuItemExit;
private javax.swing.JMenuItem jMenuItemMatriksFeromon;
private javax.swing.JMenuItem jMenuItemNew;
```

```
private javax.swing.JMenuItem jMenuItemParameter;
private javax.swing.JMenuItem jMenuItemRun;
private javax.swing.JMenuItem jMenuItemTabelProbabilitas;
private javax.swing.JPanel jPanel1;
private javax.swing.JScrollPane jScrollPane1;
private javax.swing.JScrollPane jScrollPane2;
private javax.swing.JScrollPane jScrollPane3;
private javax.swing.JScrollPane jScrollPane4;
private javax.swing.JScrollPane jScrollPane5;
private javax.swing.JSpinner jSpinnerAlpha;
private javax.swing.JSpinner jSpinnerAnt;
private javax.swing.JSpinner jSpinnerBeta;
private javax.swing.JSpinner jSpinnerJenisMesin;
private javax.swing.JSpinner jSpinnerJmlJob;
private javax.swing.JSpinner jSpinnerJmlProses;
private javax.swing.JSpinner jSpinnerNCMax;
private javax.swing.JSpinner jSpinnerRho;
private javax.swing.JTable jTableFeromon;
private javax.swing.JTable jTableMesin;
private javax.swing.JTable jTableProbabilitas;
private javax.swing.JTable jTableProses;
private javax.swing.JTextArea jTextAreaResult;
// End of variables declaration

}
```

LAMPIRAN C
HASIL UJI PERFORMANSI

C1. Uji Performansi 1

No	Jidno	Start Date	Compl Date	Step Operation	WCn Plant	Act Time
15	1834689	03-12-2010	08-12-2010	1000	7	0.417
19	1834033	08-11-2010	09-11-2010	1000	6	0.750
20	1834033	08-11-2010	09-11-2010	2000	3	0.083
11	1834354	03-12-2010	07-12-2010	1000	8	0.370
12	1834354	03-12-2010	07-12-2010	2000	9	0.230
1	1834904	01-12-2010	06-12-2010	1000	7	0.400
4	1834683	02-12-2010	07-12-2010	1000	7	0.450
23	1833793	08-11-2010	11-11-2010	1000	7	0.500
13	1834354	03-12-2010	07-12-2010	3000	10	0.600
14	1834354	03-12-2010	07-12-2010	4000	3	0.083
16	1834689	03-12-2010	08-12-2010	2000	8	0.503
21	1834037	08-11-2010	09-11-2010	1000	6	0.750
22	1834037	08-11-2010	09-11-2010	2000	3	0.083
5	1834683	02-12-2010	07-12-2010	2000	8	0.570
6	1834683	02-12-2010	07-12-2010	3000	4	2.700
2	1834904	01-12-2010	06-12-2010	2000	4	2.767
17	1834689	03-12-2010	08-12-2010	3000	4	1.633
3	1834904	01-12-2010	06-12-2010	3000	1	0.050
7	1834683	02-12-2010	07-12-2010	4000	1	0.050
8	1834178	03-12-2010	09-12-2010	1000	7	1.817
9	1834178	03-12-2010	09-12-2010	2000	8	8.050
10	1834178	03-12-2010	09-12-2010	3000	1	0.050
18	1834689	03-12-2010	08-12-2010	4000	1	0.050
24	1833793	08-11-2010	11-11-2010	2000	5	3.900
25	1833793	08-11-2010	11-11-2010	3000	2	0.167

C2. Uji Performansi 2

No	Part Number	Start Date	Compl Date	Step Operation	WCn Plant	Act Time
17	SDAG01-212-51141.5/115	08-12-2010	13-12-2010	1000	9	0.35
1	FAT11-35-51000/112		09-12-2010	1000	10	0.42
2	FAT11-35-51000/112		09-12-2010	2000	4	0.08
3	U-212-13050-2M/107		09-12-2010	1000	8	0.75
4	U-212-13050-2M/107		09-12-2010	2000	4	0.08
7	TG-330A22212800/C		09-12-2010	1000	5	0.40
18	SDAG01-212-51141.5/115		13-12-2010	2000	6	2.67
8	TG-330A22212800/C		09-12-2010	2000	11	0.35
5	U-212-13050-2M/107		09-12-2010	1000	8	0.75
9	TG-330A22212800/C		09-12-2010	3000	1	0.50
14	S5502-332A21100326/102		11-12-2010	1000	9	0.50
6	U-212-13050-2M/107		09-12-2010	2000	4	0.08
15	S5502-332A21100326/102		11-12-2010	2000	6	3.90
16	S5502-332A21100326/102		11-12-2010	3000	3	0.17
12	FTE02-35-46210		10-12-2010	1000	7	2.10
13	FTE02-35-46210		10-12-2010	2000	3	0.08
10	TG-330A22212800/C		09-12-2010	4000	8	2.67
11	TG-330A22212800/C		09-12-2010	5000	4	0.17
19	SDAG01-212-51141.5/115		13-12-2010	3000	10	0.37
20	SDAG01-212-51141.5/115		13-12-2010	4000	2	0.05

C3. Uji Performansi 3

No	Jidno	Start Date	Compl Date	Step Operation	WCn Plant	Act Time
20	1828589	16-11-2010	19-11-2010	1000	14	0.27
8	1834005		18-11-2010	1000	14	0.27
9	1834005		18-11-2010	2000	6	0.27
10	1834005		18-11-2010	3000	12	0.11
11	1834005		18-11-2010	4000	1	0.31
12	1834005		18-11-2010	5000	9	10.43
5	1834270		18-11-2010	1000	5	0.50
1	1834624		18-11-2010	1000	13	0.37
21	1828589		19-11-2010	2000	6	0.46
22	1828589		19-11-2010	3000	12	0.11
23	1828589		19-11-2010	4000	1	0.31
14	1834623		18-11-2010	1000	13	0.47
2	1834624		18-11-2010	2000	7	0.98
15	1834623		18-11-2010	2000	14	0.19
16	1834623		18-11-2010	3000	9	0.57
3	1834624		18-11-2010	3000	11	0.42
4	1834624		18-11-2010	4000	4	0.08
6	1834270		18-11-2010	2000	10	2.50
7	1834270		18-11-2010	3000	3	0.17
17	1834623		18-11-2010	4000	8	3.83
18	1834623		18-11-2010	5000	9	8.93
19	1834623		18-11-2010	6000	2	0.17
24	1828589		19-11-2010	5000	9	15.43
13	1834005		18-11-2010	6000	2	0.17
25	1828589		19-11-2010	6000	2	0.17