

Establishing databases based on computer experiments on key characteristics of continuous gas lift wells

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ABSTRACT

Program becomes matured via Design method. Utilized concepts of this stage are BDE, Data Access and Data controls Data Access plays a prominent role through all this process, moreover, it consists Data Source as well as Data Set. Data Field is irreplaceable related part of listed concepts and particularly of Data Access The result of whole process at this stage majorly rely on constructive and physical parameters. Q (V) curve directly influences the database. Q (V) curve has comprehensive structure, according to this, Microsoft Excel facilitates to the forming of its structure. All the calculations and obtained results are represented via tables Computer experiments and trials play role of source for Q(V) curve indicators and calculations.

Keywords– BDE, Data Access, Data Controls, Data Field, Data Set, Data Source, Q (V) curve.

Date of Submission: 18-08-2017

Date of acceptance: 09-09-2017

I. INTRODUCTION

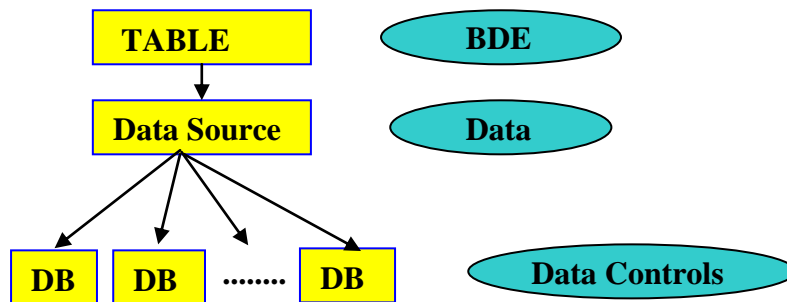
It is suggested that the main characteristics of the wells are based on computer experiments based on the average operating mode of the continuous gas lift wells. Program is developed by the method of Design. In this case, the sections of **BDE**, **Data Access**, **Data controls** are used. **Data Source** component in the Data Access section should be placed in the form and connected to **Data Set** feature. After this, components placed in Data Controls panel can be placed in the form and those components should be associated to Data Source components and **Data Field** is closed. After the parameters have been set, the establishment of BDE technology based database is built and reflected in the program. Other parameters from the database are included for the report. Theoretical basis of the work is based on the determination of wells' operating modes according to the dynamic level proposed by us. To report data on the base, the numbers of platform and well are entered and "Search" button is pressed. As a result, "Constructive and physical parameters of layer – well system" and "Values taken from database from report" are displayed on the screen. Then, it is possible to fulfill reporting pressing "Report" button. Pressing "Dynamic analysis" button, **Q (V) curve** can be started to be formed. "Report" button is pressed from the opened window. The Q (V) curve's results are reflected in the database. To analyze the obtained results precisely, you need to press the "Excel Analysis" button. The data in the

database is transmitted to "Microsoft Excel". The nucleus of the proposed system consists of a database where its indefinite indications are determined by the surface date of the well and allows the Q (V) adjustment curve of the wells based on computer experiments. The amount of working agent in the optimized and maximum modes of each well and the well production efficiency is calculated, and allowable working ranges of the wells are determined.

As is known, based on the main characteristics of gas wells, their specific operating modes (optimum and maximal), i.e., appropriate range for each well is determined and the technological regime is specified based on them depending on the technological condition and the size of the working agent. At present, active experiments are used to determine the main characteristics of the wells, which in turn results in a decrease in the productivity of the well along with certain costs. In some cases, interference with the operating mode of the well is inadmissible.

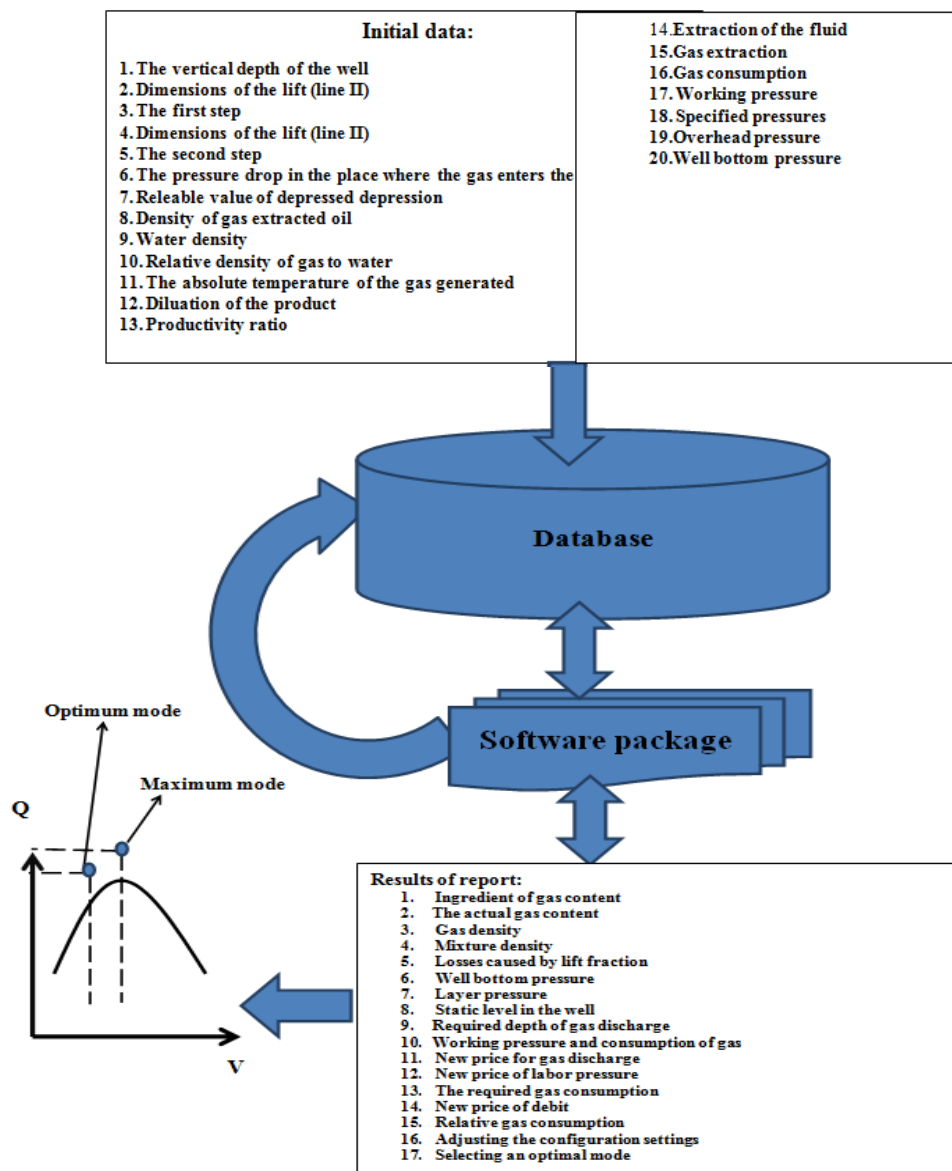
Taking into account the above mentioned, it is suggested that the main characteristics of the wells are based on computer experiments based on the average operating mode of the continuous gas lift wells.

Program is developed by the method of Design. In this case, the sections of BDE, Data Access, Data controls are used. These components' structure can be shows as follows:



First of all, the component of Table must be placed in the form. For this, 3 parameters must be determined:

- I. Database Name
- II. Table Name
- III. Active = True



At the next stage, **Data Source** component in the Data Access section should be placed in the form and connected to **Data Set** feature. After this, components placed in **Data Controls** panel can be placed in the form and those components should be associated to **Data Source** components and Data Field is closed. For the formation of the database, first of all, the constructive and physical parameters of the layer - well system should be included. These parameters include:

1. The vertical depth of the well
2. Dimensions of the lift (line II)
3. First step
4. Dimensions of the lift (line II)

5. The second step
6. The pressure drop in the place where the gas is brought into the lift
7. Allowable value of depression made into layer
8. Density of gas extracted oil
9. Layer water density
10. Relative density of gas to air
11. Absolute temperature of gas pumped
12. Dilution of the product
13. Productivity ratio

After the parameters have been set, the establishment of BDE technology based database is built and reflected in the program. As a result, the following form of database is obtained.

At the next stage, other parameters from the database are included for the report. These options include:

1. Extraction of the fluid
2. Gas extraction
3. Gas consumption

4. Working pressure
5. The mentioned pressures
6. Overhead pressure
7. Well bottom pressure

As a result, the following form of database is obtained.

Platforma	Quyunomeşi	H	D1	D2	L1	L2	Pgir	Play	Roneft	Rosu	Ronızi	T	S
DD0-10	83	1023	1,5	2,5	811	1399	0,1	2	860	1030	0,631	310	
DD0-5	94	2875,5	1,5	2,5	804	998	0,1	2	860	1030	0,631	360	
DD-17	115	2975	2	4	1503	1312	0,1	2	860	1020	0,631	310	
DD0-20	125	2987	1,5	3	1689	1235	0,1	2	860	1030	0,631	320	
DD0-10	126	3000	1	2,5	698	1104	0,1	1,5	860	1020	0,631	310	
DD0-10	185	2975	2,5	3	1659	1242	0,1	1,5	860	1020	0,631	310	
DD0-17	190	2907	1,5	2,5	1391	2824	0,1	2,2	860	1030	0,631	310	

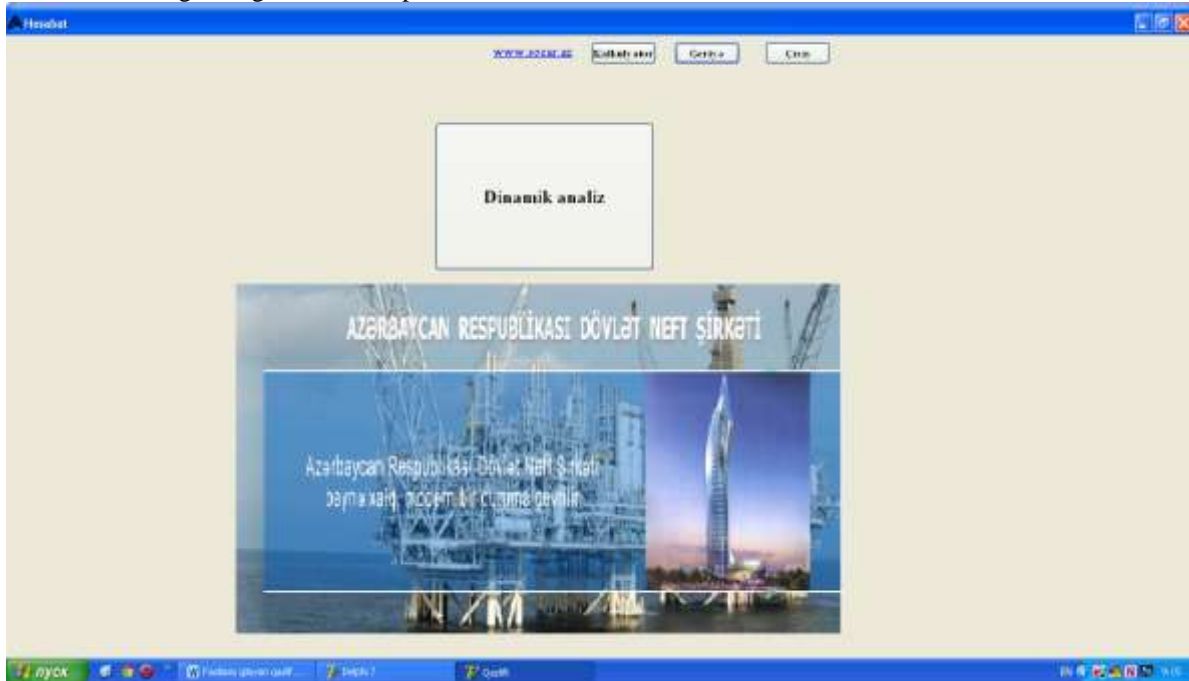
Theoretical basis of the work is based on the determination of wells' operating modes according to the dynamic level proposed by us. To report data on the base, the numbers of platform and well are entered and "Search" button is pressed. As a result, "Constructive and physical parameters of layer – well system" and "Values taken from database from report" are displayed on the screen. Then, it

is possible to fulfill reporting pressing "Report" button. As a result, the following parameters are calculated:

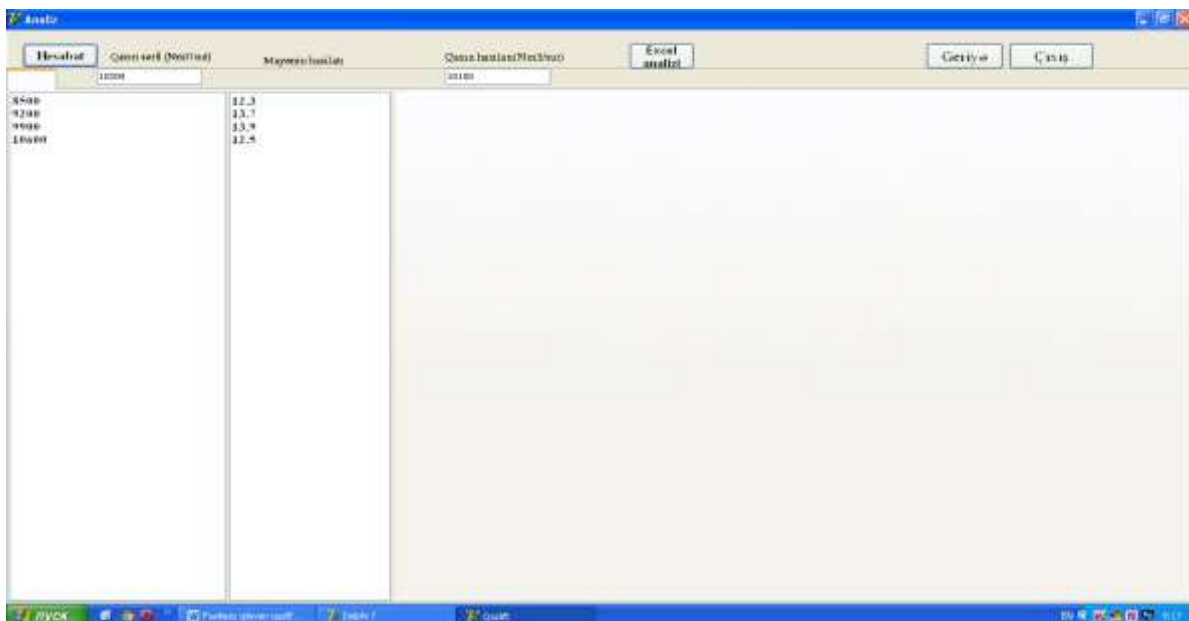
1. The diameter of the lift (line II) and its length
2. An average consumption volume of gas in the lift during the isothermal expansion
3. Phase of liquid density
4. Consumed gas content

- | | |
|--|---|
| 5. The actual gas content | 13. Working pressure and pumped gas consumption |
| 6. Gas density | 14. New value for gas discharge place |
| 7. Density of mixture | 15. New value of working pressure |
| 8. Losses in the lift caused by friction | 16. Required gas consumption |
| 9. Well bottom pressure | 17. New value of the debit |
| 10. Layer pressure | 18. Relative consumption of gas |
| 11. Static level in the well | 19. Adjusting the configuration settings |
| 12. Required discharge depth of gas | 20. Selection of optimal mode |

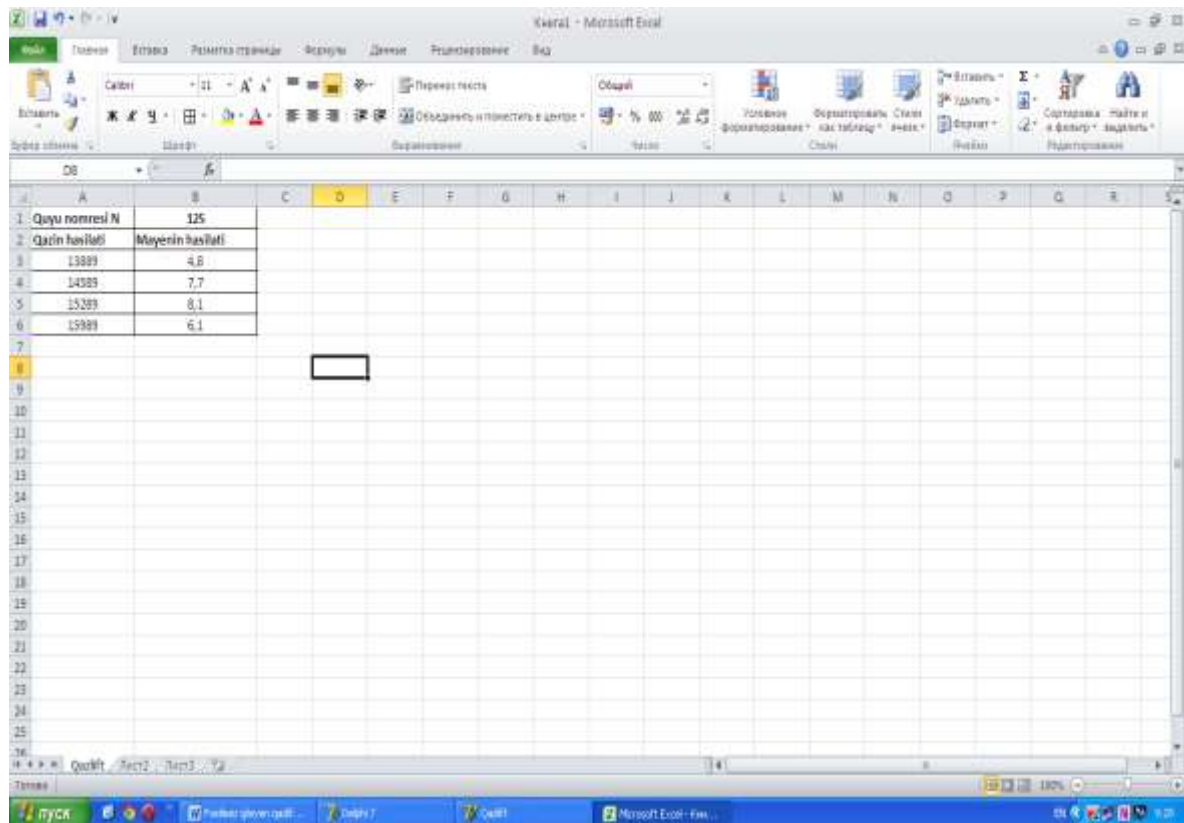
And the following dialog window is opened:



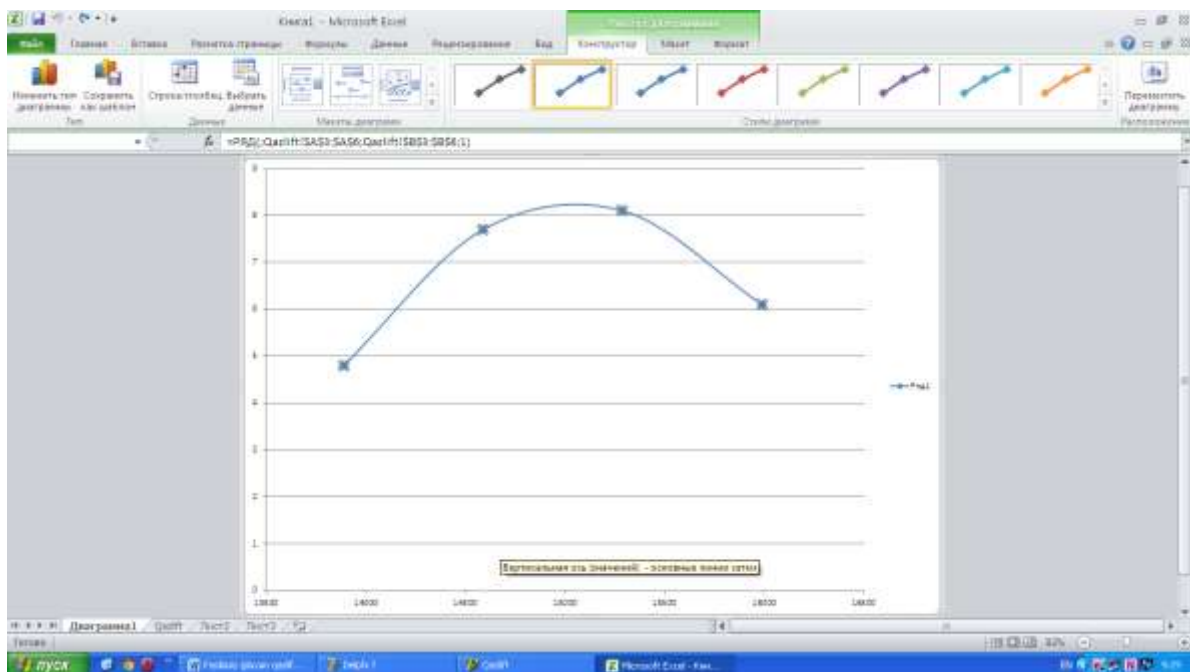
Pressing “Dynamic analysis” button, Q (V) curve can be started to be formed. As a result, “Analysis” form is opened.



“Report” button is pressed from the opened window. As a result, the Q (V) curve's results are reflected in the database. To analyze the obtained results precisely, you need to press the "Excel Analysis" button. At this time, the data in the database is transmitted to “Microsoft Excel”.



Q (V) curve is formed based on the obtained results.



A trend line is formed to analyze the curve. To do this, the context menu is opened on the curve and the "Add a trend Line" ("Добавить линию тренда") operation is performed. The "Polynom" parameter is selected from the opened window. As a result, the approximation curve of the obtained Q (V)

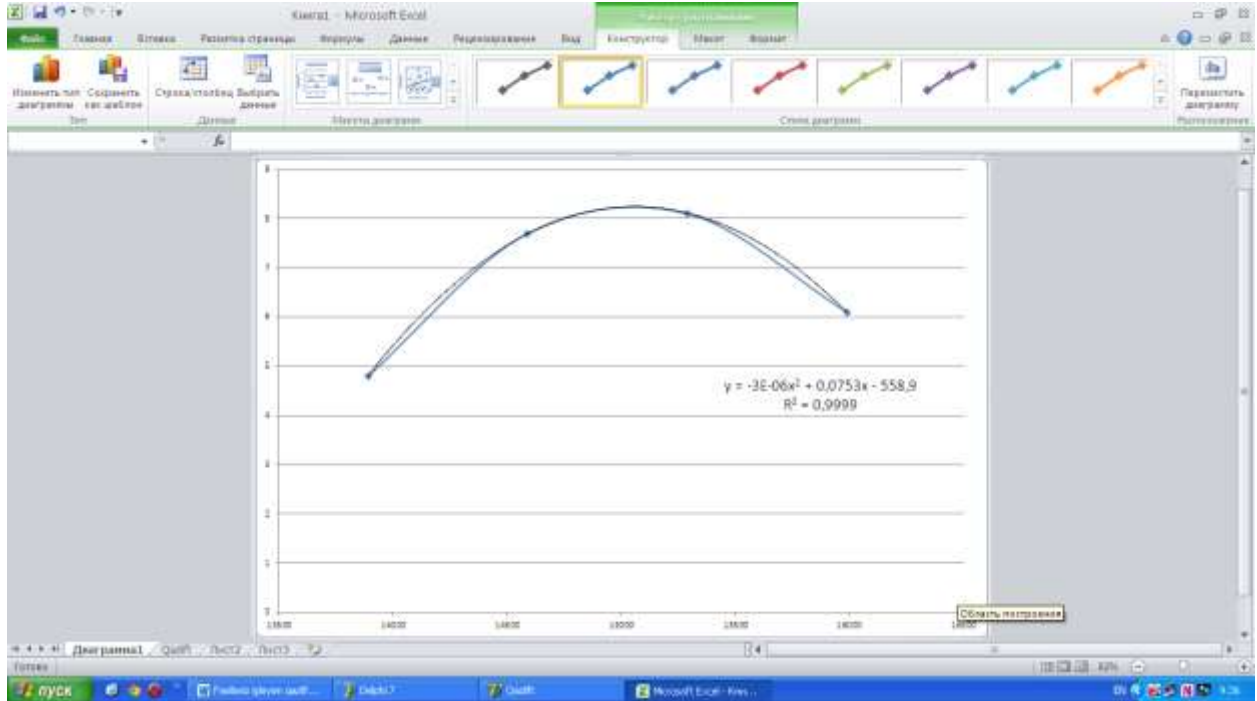
curve, its polynomial expression and the accuracy coefficient is determined.

The nucleus of the proposed system consists of a database where its indefinite indications are determined by the surface date of the well and allows the Q (V) adjustment curve of the wells based on computer experiments. As a result, the amount of

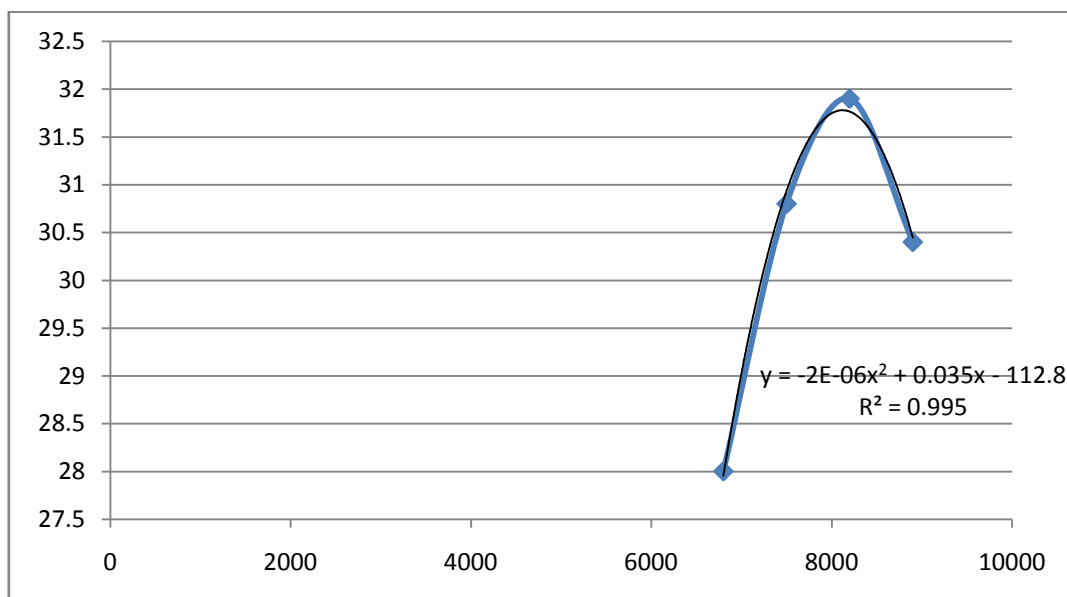
working agent in the optimized and maximum modes of each well and the well production efficiency is calculated, and allowable working

ranges of the wells are determined. Test reports indicate that the proposed method is useful.

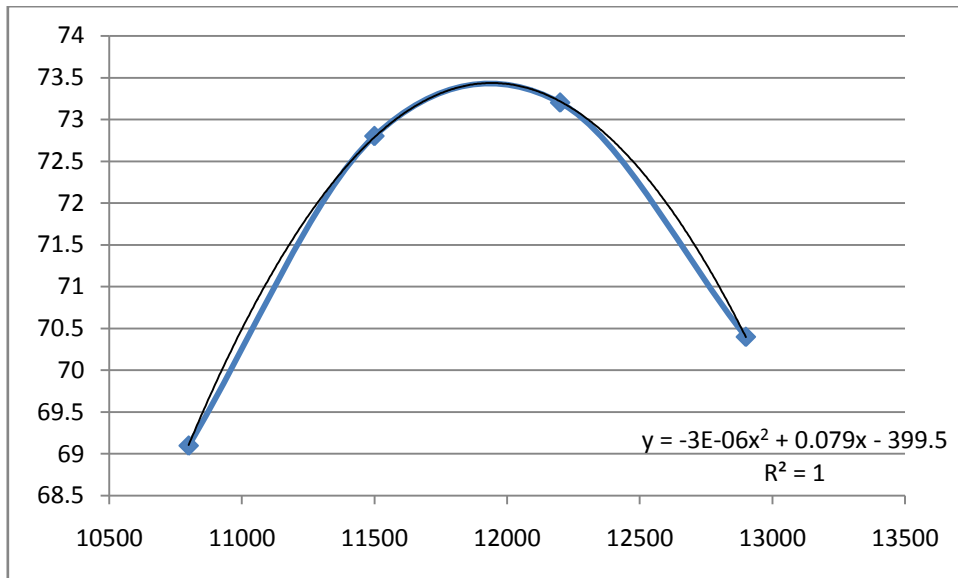
The results obtained for different wells are as follows:



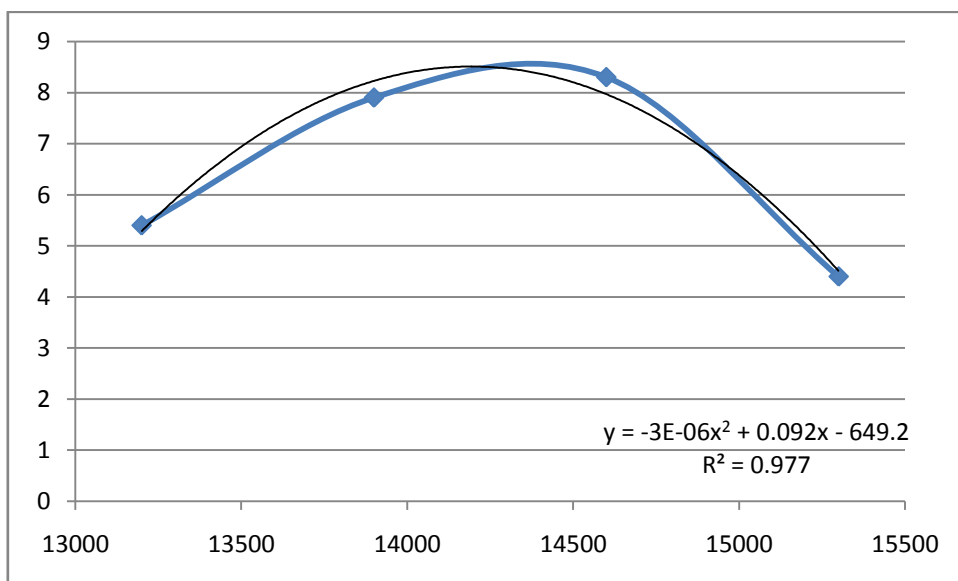
Well number	126
Gas extraction	Fluid extraction
6800	28
7500	30,8
8200	31,9
8900	30,4



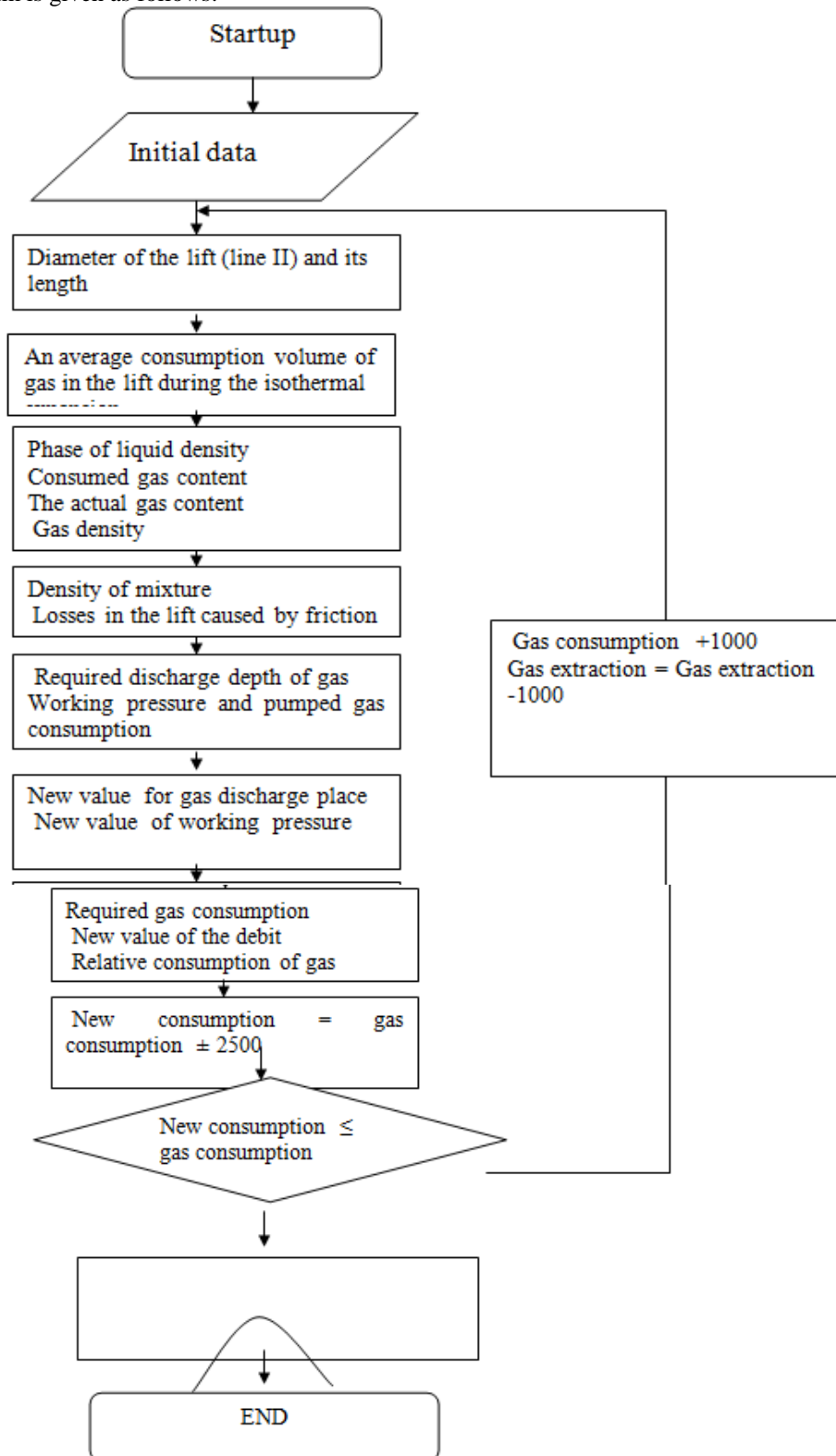
Well number	185
Gas extraction	Fluid extraction
10800	69,1
11500	72,8
12200	74,2
12900	70,4



Well number	3
Gas extraction	Fluid extraction
13200	5,4
13900	7,8
14600	8,3
15300	4,4



The calculation algorithm is given as follows:



The list of software package is given below:

```
unit Unit2;  
interface  
uses  
  Windows, Messages, Classes, SysUtils, Graphics,  
  Controls, StdCtrls, Forms,  
  Dialogs, DBCtrls, DB, Mask, DBTables, ExtCtrls,  
  Grids, DBGrids,  
  RpRenderRTF, RpRenderHTML, RpRender,  
  RpRenderPDF, RpCon, RpConDS,  
  RpConBDE, RpDefine, RpRave, ComCtrls,  
  XPMan;
```

type

```
TForm2 = class(TForm)  
  Table1H: TFloatField;  
  Table1D1: TFloatField;  
  Table1D2: TFloatField;  
  Table1L1: TFloatField;  
  Table1L2: TFloatField;  
  Table1Pgir: TFloatField;  
  Table1Play: TFloatField;  
  Table1Roneft: TFloatField;  
  Table1Rosu: TFloatField;  
  Table1Ronisbi: TFloatField;  
  Table1T: TFloatField;  
  Table1S: TFloatField;  
  Table1K: TFloatField;  
  Table1May_has: TFloatField;  
  Table1Qaz_has: TFloatField;  
  Table1Qaz_serf: TFloatField;  
  Table1Isci_teyziq: TFloatField;  
  Table1Qustu_teyziq: TFloatField;  
  Table1Qdibi_teyziq: TFloatField;  
  DataSource1: TDataSource;  
  Table1: TTable;  
  GroupBox2: TGroupBox;  
  Label6: TLabel;  
  Label7: TLabel;  
  Label8: TLabel;  
  Label9: TLabel;  
  Label10: TLabel;  
  Label11: TLabel;  
  Label12: TLabel;  
  Label13: TLabel;  
  Label14: TLabel;  
  DBEdit6: TDBEdit;  
  DBEdit7: TDBEdit;  
  DBEdit8: TDBEdit;  
  DBEdit9: TDBEdit;  
  DBEdit10: TDBEdit;  
  DBEdit11: TDBEdit;  
  DBEdit12: TDBEdit;  
  DBEdit13: TDBEdit;  
  DBEdit14: TDBEdit;  
  Label1: TLabel;  
  DBEdit1: TDBEdit;  
  DBEdit2: TDBEdit;
```

```
Label2: TLabel;  
Label3: TLabel;  
DBEdit3: TDBEdit;  
Label4: TLabel;  
DBEdit4: TDBEdit;  
GroupBox1: TGroupBox;  
DBEdit5: TDBEdit;  
Label5: TLabel;  
DBEdit16: TDBEdit;  
Label16: TLabel;  
DBEdit17: TDBEdit;  
Label17: TLabel;  
DBEdit18: TDBEdit;  
Label18: TLabel;  
DBEdit20: TDBEdit;  
Label20: TLabel;  
DBEdit21: TDBEdit;  
Label21: TLabel;  
Label15: TLabel;  
Label19: TLabel;  
DBEdit15: TDBEdit;  
Table1Quyonomresi: TFloatField;  
Table1Field1_1: TFloatField;  
Table1Field1_2: TFloatField;  
Table1Field1_3: TFloatField;  
Table1Field1_4: TFloatField;  
Table1Field1_5: TFloatField;  
Table1Field1_6: TFloatField;  
Table1Field1_7: TFloatField;  
Table1Field1_8: TFloatField;  
Table1Field1_9: TFloatField;  
Table1Field1_10: TFloatField;  
Table1Field1_11: TFloatField;  
Table1Field1_12: TFloatField;  
Table1Field1_13: TFloatField;  
DBGrid1: TDBGrid;  
Button1: TButton;  
Edit1: TEdit;  
Button2: TButton;  
Label22: TLabel;  
Table1Field1_14: TFloatField;  
Table1Field1_15: TFloatField;  
Table1Field1_16: TFloatField;  
Table1Field1_17: TFloatField;  
Table1Field1_18: TFloatField;  
Table1Field1_19: TFloatField;  
Panel1: TPanel;  
DBNavigator: TDBNavigator;  
Button4: TButton;  
Table1Field1_20: TFloatField;  
StatusBar1: TStatusBar;  
Button3: TButton;  
DBEdit19: TDBEdit;  
Table1Platforma: TStringField;  
Label23: TLabel;  
Edit2: TEdit;  
Label24: TLabel;  
DBEdit22: TDBEdit;
```

```
Label25: TLabel;
Table1Pzab: TFloatField;
GroupBox3: TGroupBox;
XPManifest1: TXPManifest;
procedure FormCreate(Sender: TObject);
procedure Table1CalcFields(DataSet: TDataSet);
procedure Button1Click(Sender: TObject);
procedure Button2Click(Sender: TObject);
procedure Button4Click(Sender: TObject);
procedure Button5Click(Sender: TObject);
procedure FormActivate(Sender: TObject);
procedure FormClose(Sender: TObject; var
Action: TCloseAction);
procedure Button3Click(Sender: TObject);
private
{ private declarations }
public
{ public declarations }
end;

var
Form2: TForm2;
implementation
uses Unit3, Unit1;
{$R *.DFM}

procedure TForm2.FormCreate(Sender: TObject);
begin
Table1.Open;
end;
procedure TForm2.Table1CalcFields(DataSet:
TDataSet);
var rzab,rsre,psr,P0,a,b,alb,a1,a2,a3,pu:real;
begin
a1:=((table1['d1']*table1['L1']+table1['d2']*table1['
L2']));
a2:=((table1['L1']+table1['L2']));
table1['1_1']:=a1/a2;
p0:=0.1;
a:=(table1['qaz_has']*P0*ln(table1['isci_teyziq']/tabl
e1['Qustu_teyziq']));
b:= ((table1['isci_teyziq']-table1['Qustu_teyziq']));
table1['1_2']:=a/b;
alb:=table1['s']/100;
table1['1_3']:=table1['roneft']*(1-
alb)+table1['rosu']*alb;
table1['1_4']:=table1['1_2']/(Table1['1_2']+table1['m
ay_has']);
table1['1_5']:=0.833*table1['1_4'];
psr:=(table1['isci_teyziq']+table1['Qustu_teyziq'])/2;
table1['1_6']:=table1['ronisbi']*1.29*psr*273/(0.1*ta
ble1['T']);
table1['1_7']:=1-
table1['1_5']*table1['1_3']+table1['1_5']*table1['1_
6'];
table1['1_8']:=0.12*table1['may_has']*table1['1_2']
*table1['1_3']*9.8)/(2.7*2.7*2.7*2.7*2.7*86.4*86.4
);
table1['1_9']:=1000000*(table1['Isci_teyziq']-
table1['Qustu_teyziq']-
table1['Pgir'])/(table1['1_7']*9.8+table1['1_8']-
(table1['Isci_teyziq']*(1+1.22*table1['ronisbi'])));
rzab:=table1['1_7']*table1['Qaz_has']/(table1['Qaz_h
as']-table1['Qaz_serf']);
rsre:=(table1['1_7']+rzab)/2;
a3:=exp(6*ln(10))*table1['Isci_teyziq']*(1+1.22*ex
p(-
4*ln(10))*table1['1_9']*table1['ronisbi'])+(table1['H
']-table1['1_9'])*rsre;
table1['1_10']:=a3/1000000;
table1['1_11']:=table1['1_10']*1000000/(rsre*9.8);
table1['1_12']:=table1['1_10']+(table1['May_has']/ta
ble1['K']);
Table1['1_13']:=table1['1_12']*1000000/(Table1['1_
3']*9.8);
//Neticeler
table1['1_14']:=table1['1_12']-(Table1['Play']+0.5);
Pu:=5;
Table1['1_15']:=table1['1_14']-
Pu+table1['H']*table1['1_7']*9.8-
table1['Pgir']/(rsre*9.8-
table1['Isci_teyziq']*1.22*exp(-
4*ln(10))*table1['ronisbi']+table1['1_8']);
Table1['1_16']:=table1['1_14']+(((table1['H']-
table1['1_15'])*table1['1_7']*9.8)/1000000)+table1['
Pgir']/(1+1.22*exp(-
4*ln(10))*table1['ronisbi']*table1['1_15']);
Table1['1_17']:=table1['K']*(table1['1_12']-
table1['1_14']);
table1['1_18']:=table1['1_16']*table1['Qaz_serf']/tabl
e1['Isci_teyziq'];
table1['1_19']:=table1['1_18']/table1['1_17'];
table1['1_20']:=1000000*(table1['1_14']-
TABLE1['Qdibi_teyziq'])/(RSRE*9.8)
}
end;
procedure TForm2.Button1Click(Sender: TObject);
begin
form3.showmodal;
form3.Table1.Close ;
form3.Table1.Open ;
end;
procedure TForm2.Button2Click(Sender: TObject);
VAR A,B,C:STRING;
begin
a:=(Platforma='+'''+edit2.text+'');
b:= ('Quyunomresi='+edit1.Text );
c:=(a)+' and '+'(b);
table1.Filter :=c;
table1.Filtered :=true;
end;
procedure TForm2.Button4Click(Sender: TObject);
begin
form1.close;
end;
procedure TForm2.Button5Click(Sender: TObject);
```

```
begin
table1.Filtered :=false;
end;
procedure TForm2.FormActivate(Sender: TObject);
begin
//statusbar1.Panels[1].Text :=timetostr(time);
statusbar1.Panels[1].Text :=datetostr(date);
end;
procedure TForm2.FormClose(Sender: TObject; var
Action: TCloseAction);
begin
form1.close;
end;
procedure TForm2.Button3Click(Sender: TObject);
begin
table1.Filtered :=false;
end;
end.

unit Unit3;
interface
uses
Windows, Messages, SysUtils, Variants, Classes,
Graphics, Controls, Forms,
Dialogs, StdCtrls, Grids, DBGrids, DB, DBTables,
Mask, DBCtrls,
RpRenderHTML, RpRenderPDF, RpRender,
RpRenderRTF, RpCon, RpConDS,
RpConBDE, RpDefine, RpRave,
XPMan,MATH,shellapi, ActnMan,
ActnColorMaps;

type
TForm3 = class(TForm)
DBGrid1: TDBGrid;
Button1: TButton;
Button2: TButton;
Label15: TLabel;
Label16: TLabel;
Label18: TLabel;
DBEdit1: TDBEdit;
DBEdit2: TDBEdit;
Label1: TLabel;
DBEdit3: TDBEdit;
Label17: TLabel;
DBEdit5: TDBEdit;
Label2: TLabel;
DBEdit6: TDBEdit;
DBEdit7: TDBEdit;
Label3: TLabel;
Label4: TLabel;
DBEdit8: TDBEdit;
Button3: TButton;
XPManifest1: TXPManifest;
Table1: TTable;
Table1H: TFloatField;
Table1D1: TFloatField;
Table1D2: TFloatField;
Table1L1: TFloatField;
Table1L2: TFloatField;
Table1Pgir: TFloatField;
Table1Play: TFloatField;
Table1Roneft: TFloatField;
Table1Rosu: TFloatField;
Table1Ronisbi: TFloatField;
Table1T: TFloatField;
Table1S: TFloatField;
Table1K: TFloatField;
Table1May_has: TFloatField;
Table1Qaz_has: TFloatField;
Table1Qaz_serf: TFloatField;
Table1Isci_teyziq: TFloatField;
Table1Qustu_teyziq: TFloatField;
Table1Qdibi_teyziq: TFloatField;
Table1Quyunomresi: TFloatField;
Table1Field1_1: TFloatField;
Table1Field1_2: TFloatField;
Table1Field1_3: TFloatField;
Table1Field1_4: TFloatField;
Table1Field1_5: TFloatField;
Table1Field1_6: TFloatField;
Table1Field1_7: TFloatField;
Table1Field1_8: TFloatField;
Table1Field1_9: TFloatField;
Table1Field1_10: TFloatField;
Table1Field1_11: TFloatField;
Table1Field1_12: TFloatField;
Table1Field1_13: TFloatField;
Table1Field1_14: TFloatField;
Table1Field1_15: TFloatField;
Table1Field1_16: TFloatField;
Table1Field1_17: TFloatField;
Table1Field1_18: TFloatField;
Table1Field1_19: TFloatField;
Table1Field1_20: TFloatField;
DataSource1: TDataSource;
Label5: TLabel;
DBEdit9: TDBEdit;
Table1Platforma: TStringField;
Button4: TButton;
Label6: TLabel;
Table1Pzab: TFloatField;
Table1Field1_21: TFloatField;
Table1Field1_22: TFloatField;
XPColorMap1: TXPColorMap;
Button6: TButton;
DBEdit4: TDBEdit;
procedure Button1Click(Sender: TObject);
procedure Button2Click(Sender: TObject);
procedure Button3Click(Sender: TObject);
procedure Table1CalcFields(DataSet: TDataSet);
procedure FormActivate(Sender: TObject);
procedure Button4Click(Sender: TObject);
procedure Label6Click(Sender: TObject);
procedure Button6Click(Sender: TObject);
private
```

```

    { Private declarations }
public
    { Public declarations }
end;
var
    Form3: TForm3;
implementation
uses Unit2, Unit1, Unit4;
{$R *.dfm}
procedure TForm3.Button1Click(Sender: TObject);
begin
    form3.Close;
    table1.Close;
    form2.show;
end;
procedure TForm3.Button2Click(Sender: TObject);
begin
    form1.close;
end;
procedure TForm3.Button3Click(Sender: TObject);
begin
    //RvProject1.ExecuteReport('Report3');
end;
procedure TForm3.Table1CalcFields(DataSet:
TDataSet);
var
    rzab,rsre,psr,P0,a,b,c,d,aa,bb,alb,a1,a2,a3,pu:real;
begin
    a1:=((table1['d1']*table1['L1']+table1['d2']*table1['L
    2']));
    a2:=((table1['L1']+table1['L2']));
    table1['1_1']:=ROUNDTO((a1/a2),-2);
    P0:=0.1;
    a:=(table1['qaz_has']*P0)*(ln(table1['isci_teyziq']/ta
    ble1['Qustu_teyziq']));
    b:= ((table1['isci_teyziq']-table1['Qustu_teyziq']));
    table1['1_2']:=roundto(a/b,-2);
    alb:=table1['s']/100;
    table1['1_3']:=roundto(table1['roneft']*(1-
    alb)+table1['rosu']*alb,-2);
    table1['1_4']:=roundto(table1['1_2']/(Table1['1_2']+t
    able1['may_has']),-2);
    table1['1_5']:=roundto(0.833*table1['1_4'],-2);
    psr:=((table1['isci_teyziq']+table1['Qustu_teyziq']/2
    )*10; //edit1.text:=floattoastr(psr);
    table1['1_6']:=roundto(table1['ronisbi']*1.29*psr*27
    3/(1*table1['T']),-2);
    table1['1_7']:=roundto((1-
    table1['1_5'])*table1['1_3']+table1['1_5']*table1['1_
    6'],-2);
    table1['1_8']:=roundto((0.12*table1['may_has']*tabl
    e1['1_2']*table1['1_3']*9.8)/(table1['1_1']*table1['1_
    1']*table1['1_1']*table1['1_1']*table1['1_1']*
    86.4*86.4),-2);
    //table1['1_9']:=roundto((1000000*(table1['Isci_teyz
    iq']- table1['Qustu_teyziq']-
    table1['Pgir']))/(table1['1_7']*9.8+table1['1_8']-

```

```

    (table1['Isci_teyziq']*1000000*(1+1.22*0.1*0.1*0.1
    *0.1*table1['ronisbi'])), -2);
    a :=( 1000000*(table1['Isci_teyziq']-
    table1['Qustu_teyziq']-table1['Pgir']));
    b:=((table1['1_7']*9.8)+table1['1_8']);
    c:=((table1['Isci_teyziq']*1000000*(1.22*0.1*0.1*0.
    1*0.1*table1['ronisbi']));
    table1['1_9']:=roundto(a/(b-c),-2);
    rzab:=table1['1_7']*table1['Qaz_has']/(table1['Qaz_s
    erf']);
    rsre:=(table1['1_7']+rzab)/2;
    a3:=exp(6*ln(10))*table1['Isci_teyziq']*(1+1.22*ex
    p(-
    4*ln(10))*table1['1_9']*table1['ronisbi'])+(table1['H
    ']-table1['1_9'])*rsre*9.8;
    table1['1_10']:=roundto(a3/1000000,-2);
    table1['1_11']:=roundto(table1['1_10']*1000000/(rsr
    e*9.8),-2);
    table1['1_12']:=roundto(table1['1_10']+(table1['May
    _has']/table1['K']),-2);
    Table1['1_13']:=roundto(table1['1_12']*1000000/(T
    able1['1_3']*9.8),-2);
    //Neticeler
    table1['1_14']:=table1['1_10']-Table1['Play'];
    //Pu:=5;
    Pu:=table1['Qustu_teyziq'];
    aa:=((table1['1_14']-Pu-
    table1['Pgir'])*exp(6*ln(10))+table1['H']*ta
    ble1['1_7']*9.8) ;
    //edit1.Text :=floattoastr(aa);
    bb:=((rsre*9.8-table1['Isci_teyziq']*1.22*exp(-
    4*ln(10))*table1['ronisbi']+table1['1_8']));
    //edit2.Text :=floattoastr(bb);
    //edit3.Text :=floattoastr(rsre);
    Table1['1_15']:=roundto(aa/bb,-2);
    Table1['1_16']:=((table1['1_14']+((table1['H']-
    table1['1_15'])*table1['1_7']*9.8)/1000000)+table1['
    Pgir']/(1+1.22*exp(-
    4*ln(10))*table1['ronisbi']*table1['1_15']));
    Table1['1_17']:=roundto(table1['K']*(table1['1_12']-
    table1['1_14']),-3);
    table1['1_18']:=roundto(table1['1_16']*(table1['qaz_
    has']-table1['Qaz_serf'])/table1['Isci_teyziq'],-3);
    table1['1_19']:=roundto(table1['1_18']/table1['1_17']
    ,-3);
    table1['1_20']:=roundto(1000000*(table1['1_14']-
    TABLE1['isci_teyziq'])/(RSRE*9.8),-3);
    table1['1_21']:=roundto((table1['1_12']*1000000)/(r
    zab*9.8),-3);
    //table1['1_22']:=roundto(((table1['1_14']-
    table1['Pzab'])*1000000)/(rzab*9.8),-3);
end;

procedure TForm3.FormActivate(Sender: TObject);
VAR A,B,C:STRING;
begin
    form3.Table1.Close ;
    form3.Table1.Open ;

```

```
a:=(Platforma='+'''+form2.edit2.text+'');
b:=(Quyunomresi='+form2.edit1.Text);
c:=(a)+' and '(b);
table1.Filter :=c;
table1.Filtered :=true;
dbedit9.Refresh ; dbedit8.Refresh ; dbedit1.Refresh
;
//dbedit2.Refresh ; dbedit3.Refresh ;
dbedit4.Refresh ;
dbedit5.Refresh ; dbedit6.Refresh ; dbedit7.Refresh ;
//dbedit10.Refresh ; dbedit11.Refresh ;
form3.Refresh ;
end;
procedure TForm3.Button4Click(Sender: TObject);
begin
winexec('calc',sw_show);
end;
procedure TForm3.Label6Click(Sender: TObject);
begin
```

```
shellexecute(handle,'open','www.socar.az',0,0,sw_sh
ow);
end;
procedure TForm3.Button6Click(Sender: TObject);
begin
form4.showmodal;
end;
end.
```

```
unit Unit4;
interface
uses
Windows, Messages, SysUtils, Variants, Classes,
Graphics, Controls, Forms,
Dialogs, DB, DBTables, StdCtrls, math, TeEngine,
Series, ExtCtrls,
TeeProcs, Chart, ComCtrls, Mask,
DBCtrls, shellapi, comobj, OleServer,
XPMan ;
```

```
type
TForm4 = class(TForm)
Panel1: TPanel;
Button1: TButton;
PageControl1: TPageControl;
TabSheet2: TTabSheet;
Label17: TLabel;
Label16: TLabel;
Edit1: TEdit;
Edit2: TEdit;
Button5: TButton;
Memo1: TMemo;
Memo2: TMemo;
Memo3: TMemo;
Memo4: TMemo;
Splitter1: TSplitter;
Splitter2: TSplitter;
Splitter3: TSplitter;
```

```
Chart1: TChart;
Series1: TLineSeries;
Series2: TLineSeries;
Series3: TLineSeries;
XPManifest1: TXPManifest;
procedure Button1Click(Sender: TObject);
procedure FormActivate(Sender: TObject);
procedure FormClose(Sender: TObject; var
Action: TCloseAction);
procedure Button5Click(Sender: TObject);
private
{ Private declarations }
public
{ Public declarations }
end;
```

```
var
Form4: TForm4;
t11,t12,t13,t14,t15,t16,t17,t18,t19,t110:real;
```

```
t111,t112,t113,t114,t115,t116,t117,t118,t119,t120,t1
00,t200:real;
implementation
uses Unit3;
{$R *.dfm}
```

```
procedure TForm4.Button1Click(Sender: TObject);
var rzab,rsre,psr,P0,a,b,alb,a1,a2,a3,pu:real;
begin
// form3.Table1.Edit ;
// repeat
// repeat
{a1:=((form3.table1['d1']*form3.table1['L1']+form3.
table1['d2']*form3.table1['L2']));
a2:=((form3.table1['L1']+form3.table1['L2']));
form3.table1['1_1']:=ROUNDTO((a1/a2),-2);
p0:=0.1;
a:=(form3.table1['qaz_has']*P0*ln(form3.table1['isc
i_teyziq']/form3.table1['Qustu_teyziq']));
b:= ((form3.table1['isci_teyziq']-
form3.table1['Qustu_teyziq']));
t12:=roundto(a/b,-2);
//t12:=form3.table1['1_18']-2000;
t11:=0;t13:=0;t14:=0;t15:=0;t16:=0;t17:=0;t18:=0;t1
9:=0;t110:=0;
t111:=0;t112:=0;t113:=0;t114:=0;t115:=0;t116:=0;t
117:=0;t119:=0;t120:=0;
//while t12<= form3.table1['1_18']+1000 do
//begin
//memo1.Lines.add(floattostr(t12)+'+'floattostr(t114
)+ '+'floattostr(t117)+'+' + floattostr(T119));;
alb:=form3.table1['s']/100;
t13:=(form3.table1['roneft']*(1-
alb)+form3.table1['rosu']*alb);
t14:=(t12/(t12+form3.table1['may_has']));
t15:=0.833*t14;
psr:=(form3.table1['isci_teyziq']+form3.table1['Qust
u_teyziq']/2;
```

```

t16:=form3.table1['ronisbi']*1.29*psr*273/(0.1*for
m3.table1['T']);
t17:=(1-t15)*t13+t15*t16;
t18:=(0.12*form3.table1['may_has']*t12*t13*9.8)/(
2.7*2.7*2.7*2.7*2.7*86.4*86.4);
t19:=(1000000*(form3.table1['Isci_teyziq']-
form3.table1['Qustu_teyziq']-
form3.table1['Pgir'])/(t17*9.8+t18-
(form3.table1['Isci_teyziq']*(1+1.22*form3.table1['r
onisbi']))););
rzab:=t17*form3.table1['Qaz_has']/(form3.table1['Q
az_has']-form3.table1['Qaz_serf']);
rsre:=(t17+rzab)/2;
a3:=exp(6*ln(10))*form3.table1['Isci_teyziq']*(1+1.
22*exp(-
4*ln(10))*t19*form3.table1['ronisbi']+(form3.table
1['H']-t19)*rsre;
t110:=(a3/1000000);
t111:=t110*1000000/(rsre*9.8);
t112:=(t110+(form3.table1['May_has']/form3.table1
['K']));
T113:=(t112*1000000/(T13*9.8));
//Neticeler
t114:=t112-(form3.table1['Play']+0.5);
Pu:=5;
T115:=(t114-Pu+form3.table1['H']*t17*9.8-
form3.table1['Pgir'])/(rsre*9.8-
form3.table1['Isci_teyziq']*1.22*exp(-
4*ln(10))*form3.table1['ronisbi']+t18);
T116:=(t114+(((form3.table1['H']-
t115)*t17*9.8)/1000000)+form3.table1['Pgir']/(1+1
.22*exp(-4*ln(10))*form3.table1['ronisbi']*t115);
T117:=(form3.table1['K']*(t112-t114));
//form3.table1['1_18']:=roundto(form3.table1['1_16'
]*form3.table1['Qaz_serf']/form3.table1['Isci_teyziq'
],-3);
t119:=(t12/t117);
//form3.table1['1_20']:=roundto(1000000*(form3.ta
ble1['1_14']-
form3.table1['Qdibi_teyziq'])/(RSRE*9.8),-3);
//form3.table1['1_21']:=roundto((form3.table1['1_14
']*1000000)/(rzab*9.8),-3);
//form3.table1['1_22']:=roundto(((form3.table1['1_1
4']-form3.table1['Pzab'])*1000000)/(rzab*9.8),-3);
series1.Add(t117,floattostr(t12),clred);
series2.Add(t114,floattostr(t12),clblue);
series3.Add(t119,floattostr(t12),clgreen);
//t12:=t12+1000;;
form3.Table1.Edit ;
form3.Table1.Insert ;
table1['qaz_has']:=table1['qaz_has']+1000;
form3.Table1.Insert ;
table1['Qaz_serf']:= table1['Qaz_serf']+1000;
until table1['qaz_has']>=table1['qaz_has']+2000;
until table1['Qaz_serf'] >= table1['Qaz_serf'] +2000;
}
memo1.Clear ;
memo2.Clear ;

```

```

memo3.Clear;
memo4.Clear;
t11:=0;t13:=0;t14:=0;t15:=0;t16:=0;t17:=0;t18:=0;t1
9:=0;t110:=0;
t111:=0;t112:=0;t113:=0;t114:=0;t115:=0;t116:=0;t
117:=0;t119:=0;t120:=0;
form3.Table1.Edit ;
t100:=form3.table1['qaz_has']-2500;
t200:=form3.table1['Qaz_serf']-2500;
while t200<=form3.table1['Qaz_serf'] do
begin
while t100<=form3.table1['qaz_has'] do
begin
a1:=((form3.table1['d1']*form3.table1['L1']+form3.t
able1['d2']*form3.table1['L2']));
a2:=((form3.table1['L1']+form3.table1['L2']));
form3.table1['1_1']:=((a1/a2));
p0:=0.1;
a:=(t100*P0*ln(form3.table1['isciteyziq']/form3.ta
ble1['Qustu_teyziq']));
b:= ((form3.table1['isciteyziq']-
form3.table1['Qustu_teyziq']));
form3.table1['1_2']:=a/b;
alb:=form3.table1['s']/100;
form3.table1['1_3']:=((form3.table1['roneft']*(1-
alb)+form3.table1['rosu']*alb);
form3.table1['1_4']:=form3.table1['1_2']/(form3.tabl
e1['1_2']+form3.table1['may_has']);
form3.table1['1_5']:=((0.833*form3.table1['1_4']));
psr:=(form3.table1['isciteyziq']+form3.table1['Qust
u_teyziq']/2;
form3.table1['1_6']:=((form3.table1['ronisbi']*1.29*ps
r*273/(0.1*form3.table1['T']));
form3.table1['1_7']:=((1-
form3.table1['1_5'])*form3.table1['1_3']+form3.tabl
e1['1_5'])*form3.table1['1_6']);
form3.table1['1_8']:=((0.12*form3.table1['may_has']
*form3.table1['1_2']*form3.table1['1_3']*9.8)/(2.7*
2.7*2.7*2.7*2.7*86.4*86.4));
form3.table1['1_9']:=((1000000*(form3.table1['Isci_t
eyziq']- form3.table1['Qustu_teyziq']-
form3.table1['Pgir'])/(form3.table1['1_7']*9.8+form
3.table1['1_8']-
(form3.table1['Isci_teyziq']*(1+1.22*form3.table1['r
onisbi']))););
rzab:=form3.table1['1_7']*t100/(t100-t200);
rsre:=(form3.table1['1_7']+rzab)/2;
a3:=exp(6*ln(10))*form3.table1['Isci_teyziq']*(1+1.
22*exp(-
4*ln(10))*form3.table1['1_9']*form3.table1['ronisbi'
])+(form3.table1['H']-form3.table1['1_9'])*rsre;
form3.table1['1_10']:=a3/1000000;
form3.table1['1_11']:=((form3.table1['1_10']*100000
0/(rsre*9.8));
form3.table1['1_12']:=((form3.table1['1_10']+(form3.
table1['May_has']/form3.table1['K']));
form3.table1['1_13']:=((form3.table1['1_12']*100000
0/(form3.table1['1_3']*9.8));

```

```
//Neticeler
form3.table1['1_14']:=form3.table1['1_12']-
(form3.table1['Play']+0.5);
//Pu:=5;
Pu:=form3.Table1['Qustu_teyziq'];
form3.table1['1_15']:=((form3.table1['1_14']-
Pu+form3.table1['H']*form3.table1['1_7']*9.8-
form3.table1['Pgir'])/(rsre*9.8-
form3.table1['Isci_teyziq']*1.22*exp(-
4*ln(10))*form3.table1['ronisbi']+form3.table1['1_8'
]));
form3.table1['1_16']:=((form3.table1['1_14']+(((form
3.table1['H']-
form3.table1['1_15'])*form3.table1['1_7']*9.8)/1000
000)+form3.table1['Pgir'])/(1+1.22*exp(-
4*ln(10))*form3.table1['ronisbi']*form3.table1['1_1
5']));
form3.table1['1_17']:=((form3.table1['K']*(form3.tab
le1['1_12']-form3.table1['1_14']));
form3.table1['1_18']:=((form3.table1['1_16']*t200/fo
rm3.table1['Isci_teyziq']);
form3.table1['1_19']:=((form3.table1['1_18']/form3.t
able1['1_17']));
form3.table1['1_20']:=((1000000*(form3.table1['1_1
4']-form3.table1['Qdibi_teyziq'])/(RSRE*9.8));
t100:=t100+1000;
t200:=t200+1000;
series1.Add(form3.table1['1_17'],floatostr(t200),clr
ed);
series2.Add(form3.table1['1_16'],floatostr(t200),clr
ed);
series3.Add(form3.table1['1_19'],floatostr(t200),clr
ed);
memo1.Lines.Add(floatostr(t200));
memo2.lines.add(floatostr(form3.table1['1_17']));
memo3.lines.add(floatostr(form3.table1['1_16']));
memo4.lines.add(floatostr(form3.table1['1_19']));
end;
end;
//form3.table1['1_21']:=roundto(((form3.table1['1_14
']*1000000)/(rzab*9.8),-3);
//form3.table1['1_22']:=roundto(((form3.table1['1_1
4']-form3.table1['Pzab'])*1000000)/(rzab*9.8),-3);
end;
procedure TForm4.FormActivate(Sender: TObject);
var rzab,rsre,psr,P0,a,b,alb,a1,a2,a3,pu:real;
begin
form3.Table1.Edit ;
a1:=((form3.table1['d1']*form3.table1['L1']+form3.t
able1['d2']*form3.table1['L2']));
a2:=((form3.table1['L1']+form3.table1['L2']));
form3.table1['1_1']:=ROUNDTO((a1/a2),-2);
p0:=0.1;
a:=(form3.table1['qaz_has']*P0*ln(form3.table1['isc
i_teyziq']/form3.table1['Qustu_teyziq']));
b:= ((form3.table1['isc_i_teyziq']-
form3.table1['Qustu_teyziq']));
form3.table1['1_2']:=roundto(a/b,-2);
```

```
alb:=form3.table1['s']/100;
form3.table1['1_3']:=roundto(form3.table1['roneft']*
(1-alb)+form3.table1['rosu']*alb,-2);
form3.table1['1_4']:=roundto(form3.table1['1_2']/(fo
rm3.table1['1_2']+form3.table1['may_has']),-2);
form3.table1['1_5']:=roundto(0.833*form3.table1['1
_4'],-2);
psr:=((form3.table1['isc_i_teyziq']+form3.table1['Qust
u_teyziq'])/2);
form3.table1['1_6']:=roundto(form3.table1['ronisbi'
]*1.29*psr*273/(0.1*form3.table1['T']),-2);
form3.table1['1_7']:=roundto(((1-
form3.table1['1_5'])*form3.table1['1_3']+form3.tabl
e1['1_5']*form3.table1['1_6'],-2);
form3.table1['1_8']:=roundto((0.12*form3.table1['m
ay_has']*form3.table1['1_2']*form3.table1['1_3']*9.
8)/(2.7*2.7*2.7*2.7*2.7*86.4*86.4),-2);
form3.table1['1_9']:=roundto(1000000*(form3.table
1['Isci_teyziq']- form3.table1['Qustu_teyziq']-
form3.table1['Pgir'])/(form3.table1['1_7']*9.8+form
3.table1['1_8']-
(form3.table1['Isci_teyziq']*(1+1.22*form3.table1['r
onisbi'])),)-2);
rzab:=form3.table1['1_7']*form3.table1['Qaz_has']/(
form3.table1['Qaz_has']-form3.table1['Qaz_serf']);
rsre:=((form3.table1['1_7']+rzab)/2);
a3:=exp(6*ln(10))*form3.table1['Isci_teyziq']*(1+1.
22*exp(-
4*ln(10))*form3.table1['1_9']*form3.table1['ronisbi'
])+((form3.table1['H']-form3.table1['1_9'])*rsre;
form3.table1['1_10']:=roundto(a3/1000000,-2);
form3.table1['1_11']:=roundto(form3.table1['1_10']*
1000000/(rsre*9.8),-2);
form3.table1['1_12']:=roundto(form3.table1['1_10']
+(form3.table1['May_has']/form3.table1['K']),-2);
form3.table1['1_13']:=roundto(form3.table1['1_12']*
1000000/(form3.table1['1_3']*9.8),-2);
//Neticeler
form3.table1['1_14']:=form3.table1['1_12']-
(form3.table1['Play']+0.5);
//Pu:=5;
Pu:=form3.Table1['Qustu_teyziq'];
form3.table1['1_15']:=((form3.table1['1_14']-
Pu+form3.table1['H']*form3.table1['1_7']*9.8-
form3.table1['Pgir'])/(rsre*9.8-
form3.table1['Isci_teyziq']*1.22*exp(-
4*ln(10))*form3.table1['ronisbi']+form3.table1['1_8'
]));
form3.table1['1_16']:=((form3.table1['1_14']+(((form
3.table1['H']-
form3.table1['1_15'])*form3.table1['1_7']*9.8)/1000
000)+form3.table1['Pgir'])/(1+1.22*exp(-
4*ln(10))*form3.table1['ronisbi']*form3.table1['1_1
5']));
form3.table1['1_17']:=roundto(form3.table1['K']*(fo
rm3.table1['1_12']-form3.table1['1_14']),-3);
```

```
form3.table1['1_18']:=roundto(form3.table1['1_16']*  
form3.table1['Qaz_serf']/form3.table1['Isci_teyziq'],  
-3);  
form3.table1['1_19']:=roundto(form3.table1['1_18']/  
form3.table1['1_17'],-3);  
form3.table1['1_20']:=roundto(1000000*(form3.tabl  
e1['1_14']-  
form3.table1['Qdibi_teyziq'])/(RSRE*9.8),-3);  
//form3.table1['1_21']:=roundto((form3.table1['1_14  
'*1000000)/(rzab*9.8),-3);  
//form3.table1['1_22']:=roundto(((form3.table1['1_1  
4']-form3.table1['Pzab'])*1000000)/(rzab*9.8),-3);  
edit1.text :=form3.Table1['Qaz_serf'];  
edit2.text :=form3.Table1['Qaz_has'];  
end;  
procedure TForm4.FormClose(Sender: TObject; var  
Action: TCloseAction);  
begin  
series1.Clear ;  
series2.Clear ;  
series3.Clear ;  
form3.Table1.Close ;  
form3.Close ;  
end;  
procedure TForm4.Button5Click(Sender: TObject);  
//shellexecute(handle,'open','excel',0,0,sw_show);  
var  
a,b,c:variant;
```

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```
i,j:integer;  
begin  
a:= createoleobject('Excel.Application');  
a.visible:=true;  
a.workbooks.add;  
b:=a.workbooks[1];  
c:=b.worksheets[1];  
c.name:='Qazlift';  
c.cells[1,1]:='Qazin hasilati';  
c.cells[1,2]:='Mayenin hasilati';  
c.cells[1,3]:='Lay teyziqi';  
c.cells[1,4]:='R0';  
for i:=0 to 2 do  
begin  
c.cells[i+2,1]:=strtofloat(memo1.Lines.Strings[i]);  
;  
c.cells[i+2,2]:=strtofloat(memo2.Lines.Strings[i])  
;  
c.cells[i+2,3]:=strtofloat(memo3.Lines.Strings[i]) ;  
c.cells[i+2,4]:=strtofloat(memo4.Lines.Strings[i]) ;  
form3.table1.Next ;  
end;  
end;  
end;  
end.
```

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