СТАРООСКОЛЬСКИЙ
ТЕХНОЛОГИЧЕСКИЙ
ИНСТИТУТ им. А.А. УГАРОВА

МИСиС

НИУ БелГУ
BELGOROD STATE
UNIVERSITY (BSU)

X ВСЕРОССИЙСКАЯ НАУЧНО-ПРАКТИЧЕСКАЯ КОНФЕРЕНЦИЯ

С МЕЖДУНАРОДНЫМ УЧАСТИЕМ

«Современные проблемы горно-металлургического комплекса. Энергосбережение. Экология. Новые технологии»

II ТОМ

25–27 ноября 2013 г.
г. Старый Оскол

[illegible] 622:669
[illegible] 33:34.3
[illegible] 322

[illegible]:

[illegible] [illegible] «[illegible]», [illegible];

[illegible] [illegible] «[illegible]», [illegible];

[illegible] [illegible] «[illegible]», [illegible];

[illegible] [illegible] «[illegible]», [illegible];

[illegible] [illegible] «[illegible]», [illegible];

[illegible]

[illegible] [illegible] «[illegible]», [illegible];

[illegible] [illegible] «[illegible]», [illegible];

[illegible] [illegible] «[illegible]», [illegible];

[illegible] [illegible] «[illegible]», [illegible];

[illegible] [illegible] «[illegible]», [illegible];

[illegible] [illegible] 25-27 [illegible] 2013 [illegible] «[illegible]», 2013 [illegible] 322[illegible]

322 [illegible] [illegible] «[illegible]», [illegible].

[illegible].

[illegible] 622:669
[illegible] 33:34.3

[illegible]

[illegible] 1. [illegible]

[illegible] é é é .é ..9

[illegible] é é é é é é é é é é é é é é é é é é é ..é é 11

[illegible] 2. [illegible]

[illegible] é 15

[illegible] é 19

[illegible] é é é é é é é é é é é é é é é ..é 21

[illegible] é ..é 27

[illegible] é é é é é é é é 31

[illegible] é é é é é é é é é é é é é é é é é é .34

[illegible] é 37

[illegible] é ..40

[illegible] é .41

[illegible] é é é é é é é é é ...44

[illegible] é .47

[illegible] é ...49

[illegible] é é é é é é 52

[illegible] é é é é é é ..54

[illegible] .58

[illegible] 63

[illegible] 3. [illegible]

[illegible] 66

[illegible] ..68

[illegible] 70

[illegible] ..73

[illegible] 76

[illegible] 4. [illegible]

[illegible] IT [illegible] ..79

[illegible] .83

[illegible] .87

[illegible] .92

[illegible] ..94

[illegible] 98

[illegible] 101

[illegible] 105

[illegible] ..107

[illegible] 112

[illegible] .115

[illegible] 119

[illegible] .122

[illegible] 125

[illegible] «[illegible]» 129

[illegible] ..133

[illegible] BPWIN .137

[illegible] 141

[illegible] LONALG ..145

[illegible] 148

[illegible] ..152

[illegible] 155

[illegible] 158

[illegible] 162

[illegible] ..165

[illegible] .168

[illegible] ...170

[illegible] 173

[illegible] .176

[illegible] ...179

[illegible] 183

[illegible] 185

[illegible] 5. [illegible]

[illegible] ..187

[illegible] 191

[illegible] 195

[illegible] ..198

[illegible] ..202

[illegible] 207

[illegible] 210

[illegible] 213

[illegible] .. 216

[illegible] ..219

[illegible] .222

[illegible] ...226

[illegible] ...229

[illegible] 232

[illegible] 234

[illegible] ...239

[illegible] .242

[illegible] 245

[illegible] ..254

[illegible] 257

[illegible] 260

[illegible] 262

[illegible] ...264

[illegible] .266

[illegible] ...269

[illegible] 271

[illegible] ..274

[illegible] ..277

[illegible] ..281

[illegible] .284

[illegible] 287

[illegible] .289

[illegible] é é .292

[illegible] é ..é é 296

[illegible] é .299

[illegible] é é é é ...é 302

[illegible] é é é é é é é é é é é é é .é 305

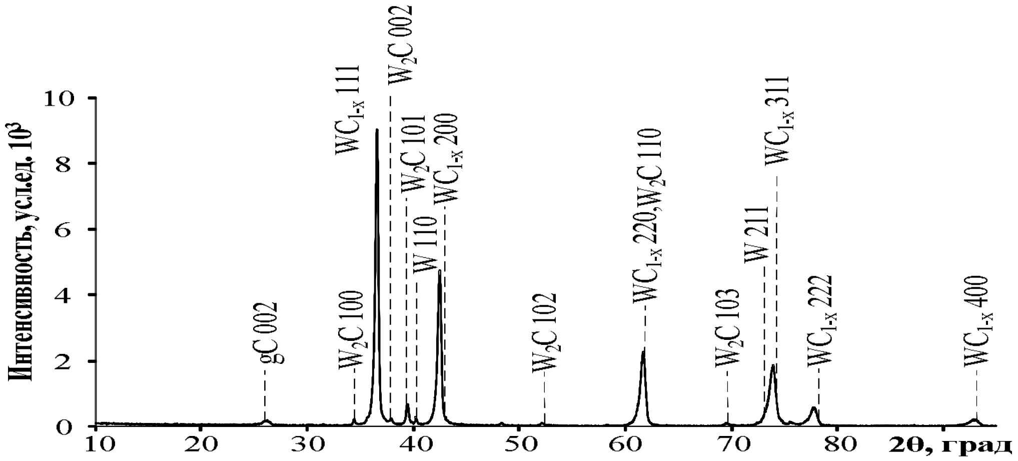
[illegible] é é é é é é é é é é é é ..308

[illegible] é 313

[illegible] é ...316

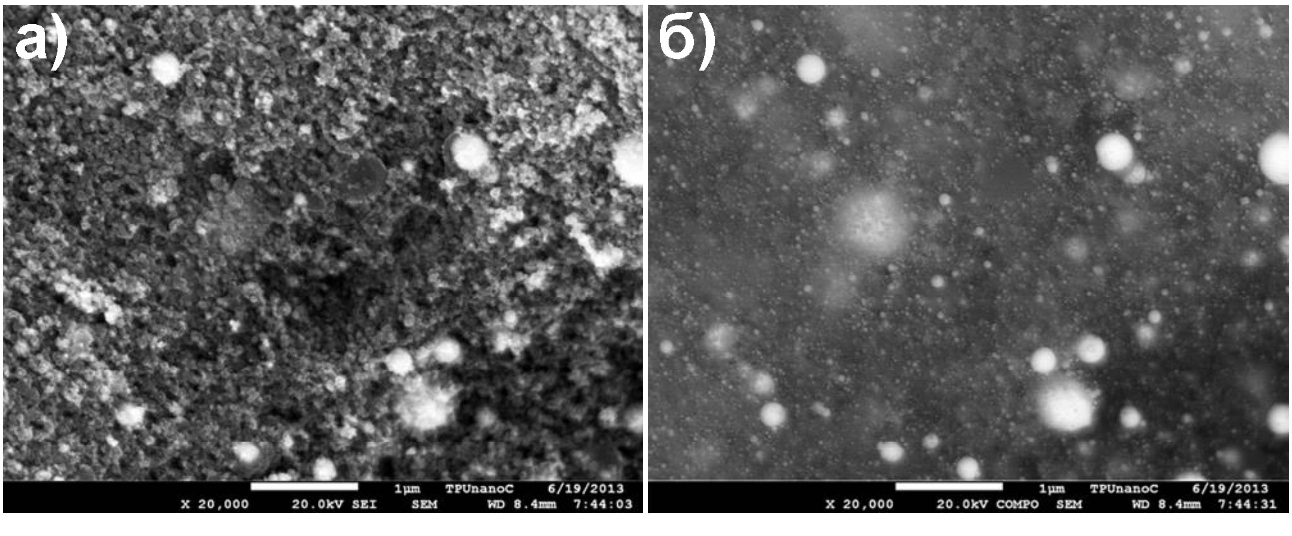
Walid Mohamed Nabih Elgohary Mahmoud The possibility of opening new markets in the arab region by exploit the mining real thoughts and strategies thereé é é é é é é é é é é é é ..319

[illegible] 1 [illegible] W, [illegible] W_2C [illegible] WC_{1-x} [illegible] gC. [illegible] PDF 2+.



[illegible] 1. [illegible]

[illegible] 2θ [illegible] 100 [illegible] (300-500 [illegible]) [illegible] 2в, [illegible]



а)
б)
1μm TPUnanoC 6/19/2013
X 20,000 20.0kV SEI SEM WD 8.4mm 7:44:03
1μm TPUnanoC 6/19/2013
X 20,000 20.0kV COMPO SEM WD 8.4mm 7:44:31

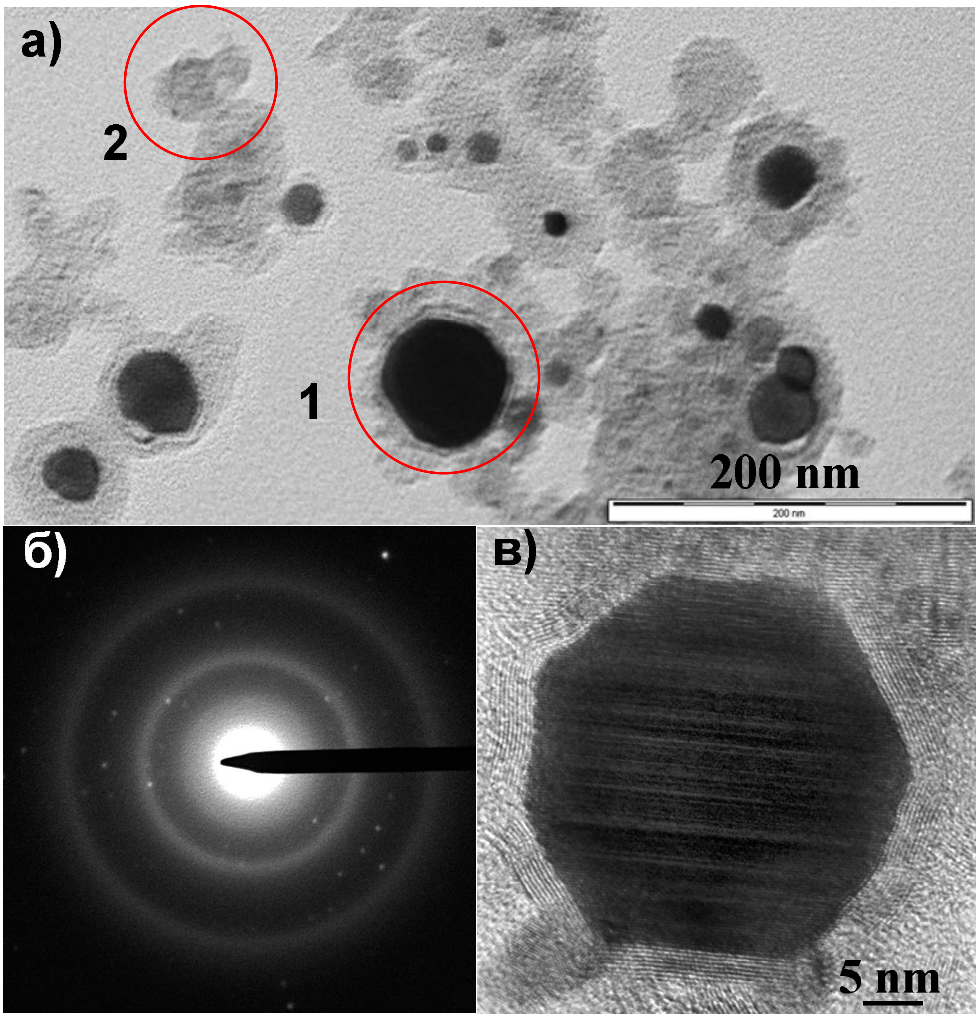
[illegible] 2. SE[illegible]-[illegible] W-C:
а) [illegible], б) [illegible]

[illegible] 3 [illegible] 2а). [illegible] 30 [illegible] 500 [illegible]

[illegible] (3в) [illegible] 2 [illegible] 1 [illegible].

[illegible] 1

[illegible] п/п	[illegible] d, Å	[illegible], Å			
		[illegible] C	W_2C	WC_{1-x}	W
1	3,299	3,395 (002)			
2	2,474			2,429 (111)	
3	2,274		2,272 (101)		2,238 (110)
4	2,103	2,139 (100)		2,107 (200)	
5	1,502		1,496 (110)	1,495 (220)	
6	1,265		1,264 (112)	1,277 (311)	1,292 (211)

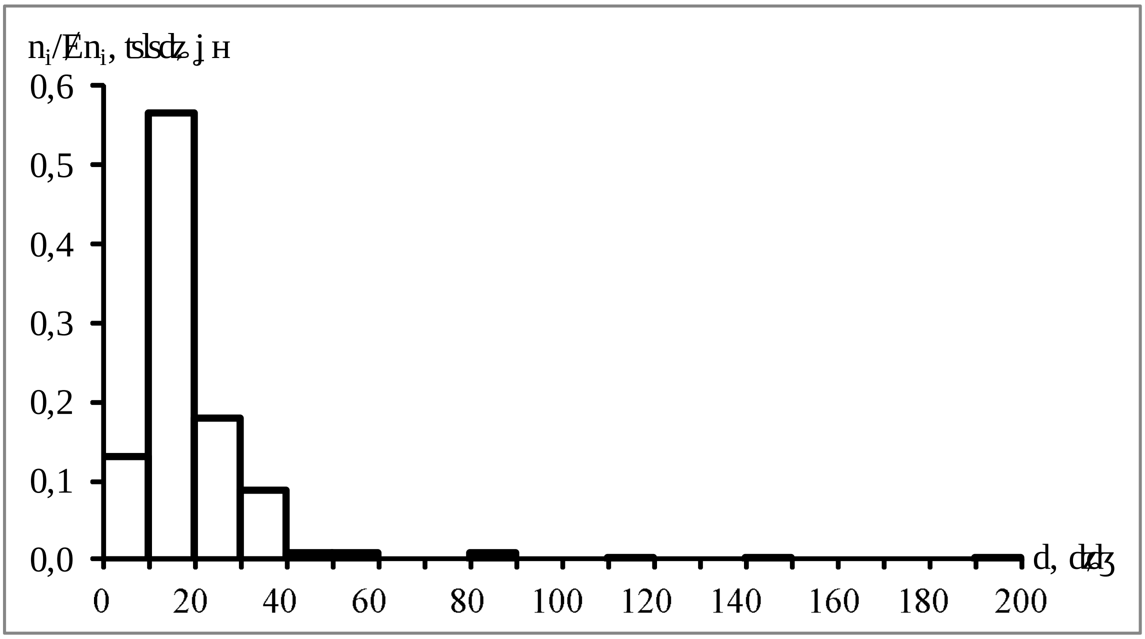


[illegible] 3. [illegible]

[illegible] 3в [illegible] HRTEM-[illegible] 30 [illegible] 12-15 [illegible] 3,5 Å. [illegible]

[illegible] HRTEM-[illegible] d_{002}=3,395 Å [illegible]

[illegible] TEM-[illegible] ([illegible]). [illegible] 50 [illegible] 10 [illegible] 20 [illegible]



[illegible] 4. [illegible]

[illegible]

[illegible]

[illegible]

1. S. Aravinth, Binu Sankar, M. Kamaraj, S. R. Chakravarthy, R. Sarathi. Synthesis and characterization of hexagonal nano tungsten carbide powder using multi walled carbon nanotubes// Int. Journal of Refractory Metals and Hard Materials.- 2012.- N 33.- P. 53-57.

2. Harjinder Singh, Pandey O. P. Single step synthesis of tungsten carbide (C) nanoparticles from scheelite ore// Ceramics International.- 2013.- N 39.- P. 6703-6706.

3. Ming-Hong Lin. Synthesis of nanophase tungsten carbide by electrical discharge machining// Ceramics International.- 2005.- N 31.- P. 1109-1115.

4. Fernando Almeida Costa Oliveira, Bernard Granier, Jean-Marie Badie, Jorge Cruz Fernandes, Luis Gueerra Rosa, Nobumitsu Shohoji. Synthesis of tungsten sub-carbide W_2C from graphite/tungsten powder mixture by eruptive heating in a solar furnace// Int. Journal of Refractory Metals and Hard Materials.- 2007.- N 25.- P. 351-357.

5. [illegible] 2431947 [illegible] 05[illegible] 11/00, F41B 6/00. [illegible] 30.04.2010; [illegible] 20.11.2011, [illegible] 29.

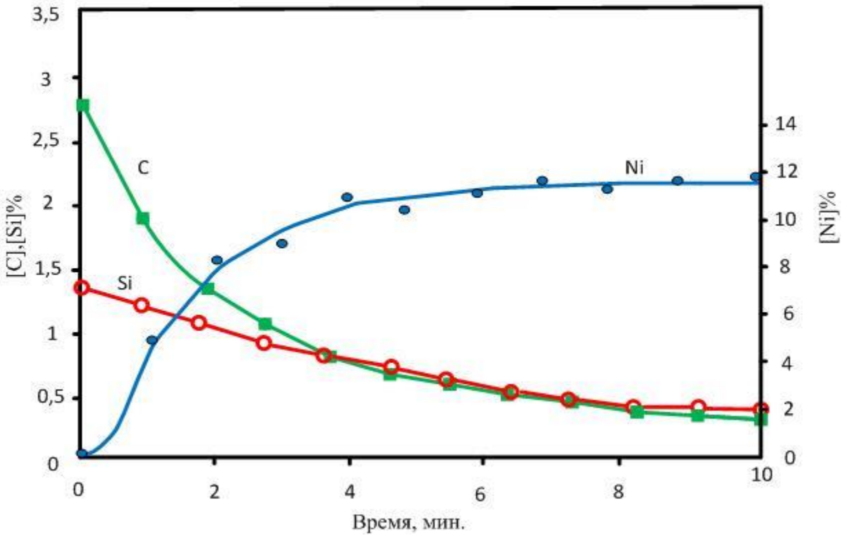
6. [illegible] 2009. - N 2(18).- C. 38-44.

[illegible] C – 2,87; Si – 1,49; Mn – 0,57; Cr – 0,25; S – 0,008; P – 0,144. [illegible]

[illegible] NiO, MnO_2, V_2O_5, Cr_2O_3 [illegible] MoO_2 [illegible] 1000 [illegible] 100 [illegible] 8905–82, [illegible]

[illegible] ([C] [illegible] [Si] [illegible]) [illegible] 10 % [illegible]

[illegible] 1 [illegible] [C] [illegible] [Si] [illegible]



[illegible] 1 [illegible] Ni, [illegible] Si, [illegible] C

[illegible] (0–3 [illegible]), [illegible]

[illegible] (NiO)+[C]=[Ni]+{[illegible]}. [illegible] [3].

[illegible] 70% [illegible] 7,5 – 8,0%. [illegible] ~1,15%, [illegible]

[illegible] (7,5÷8,0)% [illegible] ~ 11,0% [illegible] (3 – 6 [illegible]) [illegible] 90%. [illegible] 6÷10 [illegible] 0,75 % [illegible] 0,4 %.

[illegible] = 1,15% , [illegible] ~ 70 %:

$$[\%Ni]_1 = 0{,}092Ű^2 + 2{,}421Ű - 0{,}005; \qquad (1)$$

[illegible] = 0,7% , [illegible] ~ 90%:

$$[\%Ni]_2 = -0{,}225Ű^2 + 3{,}405\,Ű - 1{,}815; \qquad (2)$$

[illegible] = 0,4 % , [illegible] ~ 100 %:

$$[\%Ni]_3 = -0{,}05Ű^2 + 1{,}15\,Ű + 5{,}4 \qquad (3)$$

[illegible] 2-[illegible] Fe-C [illegible]

[illegible]

1. [illegible] // [illegible] – 1963. - [illegible] 5. – [illegible] 51 – 57.

2. [illegible]

[illegible] 5-6 [illegible] 2011. [illegible] 144-148.

3. [illegible] 1970. - [illegible] 139 [illegible] 148.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1) [illegible];

2) [illegible].

[illegible]

[illegible]

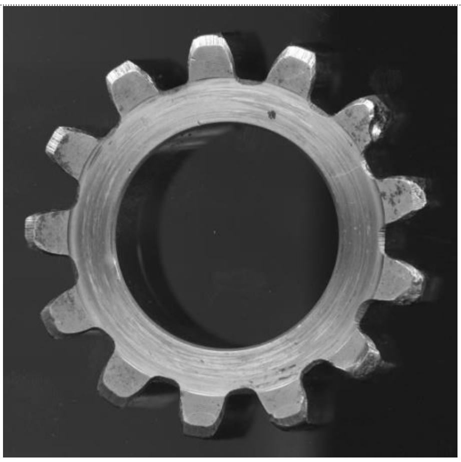
[illegible]

[illegible]

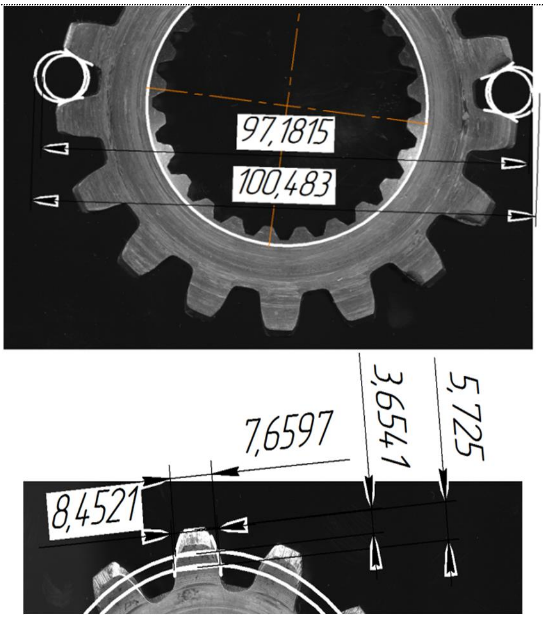
[illegible] (1). [illegible]

[illegible] ([illegible] 2). [illegible]

[illegible] Schaft 2D. [illegible]

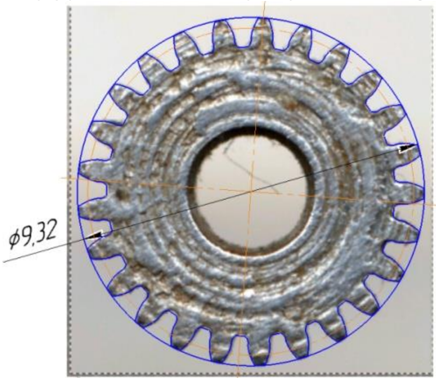


[illegible] 1


97,1815
100,483
7,6597
3,6541
5,725
8,4521

[illegible] 2

[illegible] SHAFT 2D. [illegible] SHAFT 2D [illegible] SHAFT 2D, [illegible]



[illegible] 3

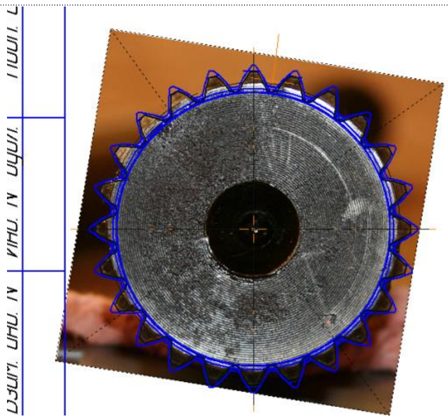
[illegible]

ɬɟɫɬɢɪɨɜɚɧɢɹ, ɩɨɫɥɟ ɱɟɝɨ ɜɵɩɨɥɧɹɥɢ ɫɪɚɜɧɟɧɢɟ ɜɢɞɢɦɵɯ ɢ ɬɟɨɪɟɬɢɱɟɫɤɢɯ ɤɨɧɬɭɪɨɜ. ɋɪɚɜɧɟɧɢɟ ɜɟɞɟɬɫɹ ɞɥɹ ɩɪɨɮɢɥɟɣ ɢ ɜɵɱɢɫɥɟɧɢɹ ɨɬɤɥɨɧɟɧɢɣ ɦɟɠɞɭ ɧɢɦɢ, ɚ ɬɚɤɠɟ ɪɚɡɦɟɪɨɜ ɢɡɞɟɥɢɹ ɢ ɟɝɨ ɩɪɨɮɢɥɹ ɩɨ ɤɨɧɬɭɪɭ ɢ ɞɪɭɝɢɦ ɩɚɪɚɦɟɬɪɚɦ ɩɨɥɭɱɟɧɧɨɝɨ ɢɡɨɛɪɚɠɟɧɢɹ ɞɟɬɚɥɢ.

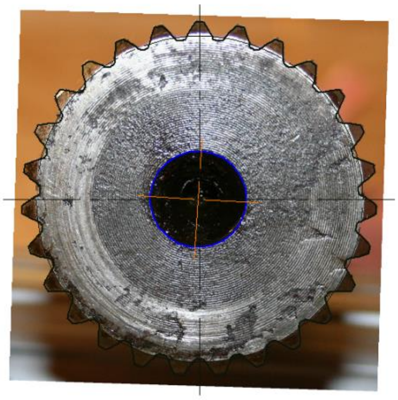
Ʉɚɤ ɜɢɞɧɨ ɢɡ ɪɢɫ. 3 ɩɨɫɥɟ ɨɛɤɚɬɤɢ ɞɢɚɦɟɬɪ ɡɚɝɨɬɨɜɤɢ ɫɨɫɬɚɜɢɥ 9,32 ɦɦ, ɩɪɢ ɷɬɨɦ ɨɬɤɥɨɧɟɧɢɹ ɪɚɡɦɟɪɨɜ ɧɟ ɩɪɟɜɵɲɚɸɬ ɞɨɩɭɫɬɢɦɵɯ ɡɧɚɱɟɧɢɣ.

ɉɪɢ ɷɬɨɦ ɦɟɬɨɞɟ ɦɨɠɧɨ ɜɵɩɨɥɧɢɬɶ ɢ ɤɨɧɬɪɨɥɶ ɤɚɱɟɫɬɜɚ ɢɡɞɟɥɢɹ ɩɨ ɪɚɡɦɟɪɚɦ ɢ ɮɨɪɦɟ ɩɪɨɮɢɥɹ, ɤɨɬɨɪɵɟ ɧɟɜɨɡɦɨɠɧɨ ɩɪɨɜɟɪɢɬɶ ɤɨɧɬɚɤɬɧɵɦɢ ɫɪɟɞɫɬɜɚɦɢ (ɲɟɫɬɟɪɧɢ) ɦɟɠɞɭ ɡɭɛɶɹɦɢ ɧɚ ɬɨɪɰɟ ɢ ɜ ɪɚɡɥɢɱɧɵɯ ɫɟɱɟɧɢɹɯ.

ɇɚɥɢɱɢɟ ɞɟɮɟɤɬɨɜ ɪɚɫɩɨɥɨɠɟɧɢɹ ɡɭɛɶɟɜ ɦɨɠɧɨ ɨɩɪɟɞɟɥɢɬɶ ɩɨ ɢɡɨɛɪɚɠɟɧɢɸ ɬɨɪɰɟɜɵɯ ɫɟɱɟɧɢɣ ɢɡɞɟɥɢɹ (ɪɢɫ. 4, 5). Ɋɚɡɦɟɪɵ ɡɭɛɶɟɜ ɫɨɫɬɚɜɥɹɸɬ 20 ɦɤɦ. ɗɬɨ ɫɜɢɞɟɬɟɥɶɫɬɜɭɟɬ ɨ ɜɵɫɨɤɨɦ ɤɚɱɟɫɬɜɟ.



ɪ ɢɫ. 4



ɪ ɢɫ. 5

Ɍɚɤɢɦ ɨɛɪɚɡɨɦ ɩɪɢɦɟɧɟɧɢɟ ɦɟɬɨɞɚ ɜ ɩɪɨɢɡɜɨɞɫɬɜɟ ɩɨɡɜɨɥɢɬ ɩɨɜɵɫɢɬɶ ɤɚɱɟɫɬɜɨ ɢ ɫɧɢɡɢɬɶ ɛɪɚɤ [1].

Ʌɢɬɟɪɚɬɭɪɚ

1. Ʉɭɞɪɹɜɰɟɜ, Ⱥ. Ʉ. ɂɡɦɟɪɟɧɢɟ ɤɨɧɬɭɪɨɜ ɞɟɬɚɥɟɣ ɫ ɩɨɦɨɳɶɸ ɰɢɮɪɨɜɨɝɨ ɨɛɪɚɡɚ ɧɚ ɨɫɧɨɜɟ ɮɨɬɨɝɪɚɦɦɟɬɪɢɢ: ɦɨɧɨɝɪɚɮɢɹ / Ⱥ. Ʉ. Ʉɭɞɪɹɜɰɟɜ, ȼ.Ⱥ. Ʉɭɡɶɦɢɧ. – Ɍɭɥɚ: Ɍɭɥ. ɝɨɫ. ɭɧ-ɬ, 2013. – 216 ɫ.

ʋ ɼ ʂ 621.787.6

ʃ ɿ ʊʀ ʃ ʀ ʅ ɸ ʎ ʀ ʗ ʈ ʗ ʏ ʀ ʃ ʃ ɻ ɻ ʀ ɻ ʈ ʃ ɸ ɻ ʈ ɸ ʅ ʀ ɻ ʅ ʃ ʁ ʃ ɻ ʈ ɸ ɻ ʃ ʊ ʂ ʀ ʅ ɸ ʃ ʉ ʅ ʃ ɻ ʗ ʂ ʈ ʀ ʊ ʗ ʈ ʀ ʗ ʋ ʗ ʗ ʃ ʔ ʅ ʃ ʁ ɿ ʃ ʃ ʊ ʅ ʃ ʉ ʊ ʀ ʂ ʀ ʅ ʗ ʊ ʀ ʏ ʗ ʉ ʂ ʃ ʁ ʕ ʅ ʗ ʈ ɿ ʀ ʀ

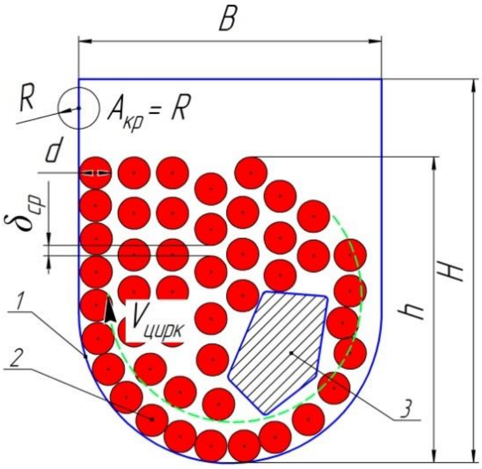
Ɉ. Ɋ. ʂ ɨɪɨɯɨɜ, ɚɫɩ. ɤɚɮ., ɬɟɯɧɨɥɨɝɢɹ ɦɚɲɢɧɨɫɬɪɨɟɧɢɹ
Ʉɭɪɫɤɢɣ ɝɨɫɭɞɚɪɫɬɜɟɧɧɵɣ ɬɟɯɧɢɱɟɫɤɢɣ ɭɧɢɜɟɪɫɢɬɟɬ

Ⱥ. ȼ. ȼɟɥɢɤɚɧ, ɤɚɧɞ. ɬɟɯɧ. ɧɚɭɤ, ɞɨɰɟɧɬ,
Ʉɭɪɫɤɢɣ ɝɨɫɭɞɚɪɫɬɜɟɧɧɵɣ ɬɟɯɧɢɱɟɫɤɢɣ ɭɧɢɜɟɪɫɢɬɟɬ ɢɦ. ȼ.ȼ. ɉɭɬɢɧɚ (ɝ. Ʉɭɪɫɤ) ɊɎ
«ʃ ʀ ʉʗʉ»

Ⱦ ɥɹ ɩɨɜɵɲɟɧɢɹ ɤɚɱɟɫɬɜɚ ɢ ɧɚɞɟɠɧɨɫɬɢ ɞɟɬɚɥɟɣ ɦɚɲɢɧ ɜɚɠɧɨɟ ɡɧɚɱɟɧɢɟ ɢɦɟɟɬ ɨɛɟɫɩɟɱɟɧɢɟ ɬɪɟɛɭɟɦɵɯ ɫɜɨɣɫɬɜ ɩɨɜɟɪɯɧɨɫɬɧɨɝɨ ɫɥɨɹ, ɤɨɬɨɪɵɟ ɨɩɪɟɞɟɥɹɸɬ ɞɨ 30% ɢ ɛɨɥɟɟ. ɋɭɳɟɫɬɜɭɸɳɢɟ ɦɟɬɨɞɵ ɨɛɟɫɩɟɱɟɧɢɹ ɤɚɱɟɫɬɜɚ ɩɨɜɟɪɯɧɨɫɬɢ ɢ ɬɟɯɧɨɥɨɝɢɱɟɫɤɢɟ ɦɟɬɨɞɵ ɭɩɪɨɱɧɟɧɢɹ ɩɨɜɟɪɯɧɨɫɬɧɨɝɨ ɫɥɨɹ ɞɟɬɚɥɟɣ.

[illegible]

[illegible]



B
R
$A_{кр} = R$
d
$\delta_{ср}$
1
2
3
$V_{цирк}$
h
H

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

3. [illegible]

[illegible] [1] [illegible]

$$E = \frac{\sum_{k=1}^{p} E_k}{f}, \qquad (1)$$

[illegible] E_k [illegible] k [illegible] p [illegible] f [illegible]

$$E_k = \frac{2}{(t_e - t_b)\cdot d\cdot l^2}\cdot\sum_{i=1}^{N}\frac{m\cdot v^2}{2} \qquad (2)$$

[illegible] t_b [illegible], t_e [illegible], d [illegible]; l [illegible] k [illegible], m [illegible]; v [illegible]; N [illegible] k [illegible] t_b [illegible] t_e.

[illegible] k [illegible]:

$$E_k = \frac{1}{(t_e - t_b)\cdot d\cdot l^2}\cdot <v>_i^2 \sum_{i=1}^{N} m \qquad (3)$$

[illegible] $<v>_i$ [illegible] k [illegible] t_b [illegible] t_e.

[illegible] («[illegible]») [illegible] k [illegible]:

$$E_k = E_k - E_k \qquad (4)$$

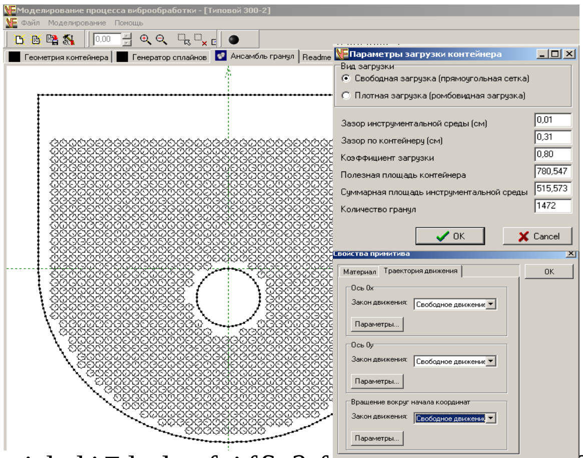
[illegible]

[illegible] «[illegible]» [illegible] «Vibrogals»[2].

[illegible]:

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]

6. [illegible].


Моделирование процесса виброобработки - [Типовой 300-2]

Параметры загрузки контейнера

Вид загрузки
● Свободная загрузка (прямоугольная сетка)
○ Плотная загрузка (ромбовидная загрузка)

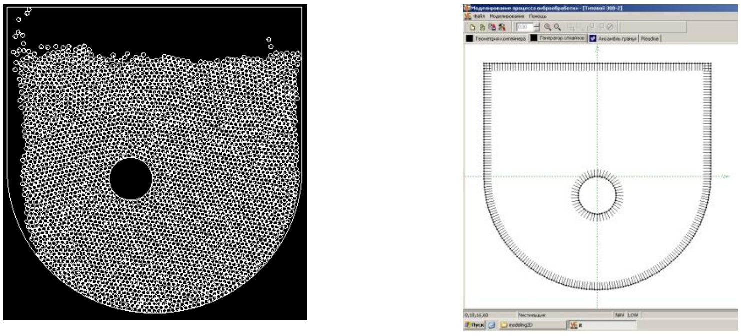
Зазор инструментальной среды (см) 0,01
Зазор по контейнеру (см) 0,31
Коэффициент загрузки 0,80
Полезная площадь контейнера 780,547
Суммарная площадь инструментальной среды 515,573
Количество гранул 1472

Свойства примитива — Траектория движения
Ось 0x — Закон движения: Свободное движение
Ось 0y — Закон движения: Свободное движение
Вращение вокруг начала координат — Закон движения: Свободное движение

Файл
Моделирование
Помощь
0,00
Геометрия контейнера
Генератор сплайнов
Ансамбль гранул
Readme
OK
Cancel
Материал
Параметры...
OK

[illegible] 2. [illegible] «[illegible]» [illegible] «Vibrogals»

[illegible]


[illegible])　　　　в)

[illegible] 3. [illegible] ([illegible]); [illegible] (в)

[illegible] [1]. [illegible]

[illegible]

$$\begin{cases} \dot{\bar{r}}_i = \bar{u}_i \\ m_i \cdot \dot{\bar{u}}_i = \sum\limits_j \left(\bar{F}^n_{ij}(\Delta_{ij}) \cdot \bar{n} \right) \cdot \bar{n} + \sum\limits_j \left(\bar{F}^\tau_{ij}(\Delta_{ij}) \cdot \bar{\tau} \right) \cdot \bar{\tau} \\ \dot{\varphi}_i = \omega_i \\ I_i \cdot \dot{\omega}_i = \dfrac{d_i}{2} \cdot \sum\limits_j \left(\bar{F}^\tau_{ij} \cdot (\Delta_{ij}) \cdot \dfrac{u^\tau_{ij}}{\left| u^\tau_{ij} \right|} \bar{\tau} \right) \cdot \bar{\tau} \end{cases} \qquad (5)$$

[illegible] $\bar{u}_i, \varphi_i$ - [illegible];

$\dot{\bar{r}}_i$, ω_i - [illegible].

$\bar{n}$, $\bar{\tau}$ - [illegible]

Δ_{ij} - «[illegible]» ([illegible]) [illegible],

d_i, I_i - [illegible] *i*-[illegible].

[illegible]

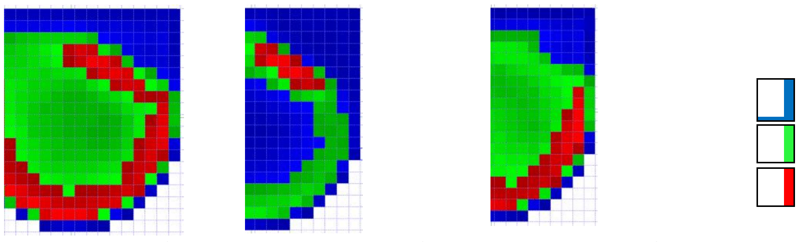
[illegible] 6N [illegible] (N - [illegible]). [illegible]

[illegible]

[illegible]

[illegible] «Vibrogals». [illegible] Rz. [illegible]

[illegible] 4). [illegible] 20-25% [illegible]



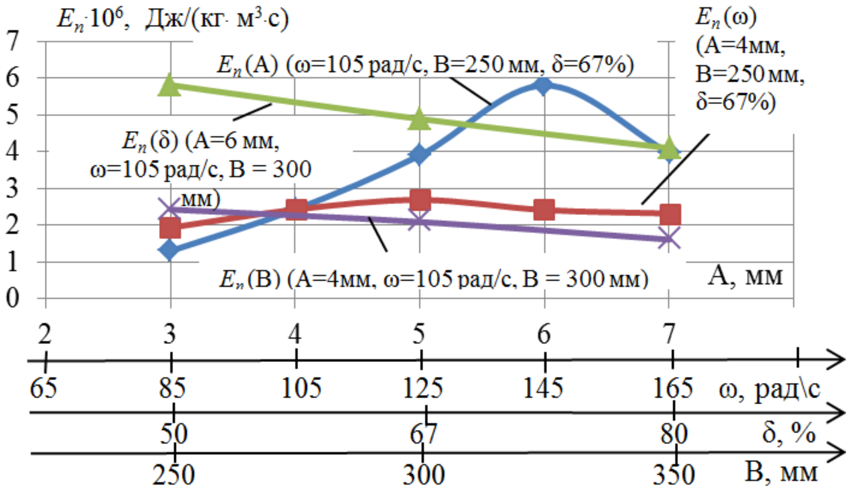
[illegible] в) [illegible]

[illegible]

[illegible]

[illegible]

[illegible]



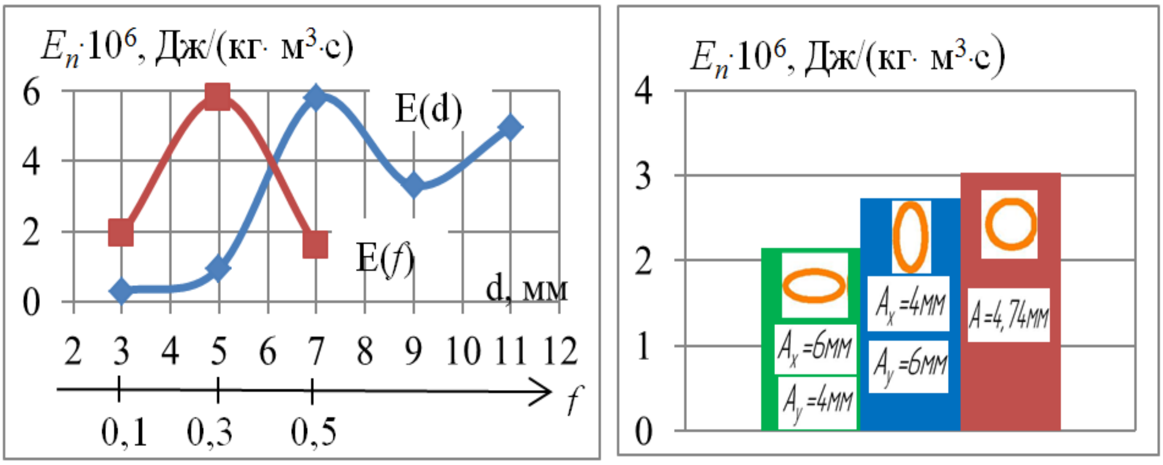
$E_n \cdot 10^6$, Дж/(кг·м³·с)
E_n(A) (ω=105 рад/с, B=250 мм, δ=67%)
E_n(ω) (A=4мм, B=250 мм, δ=67%)
E_n(δ) (A=6 мм, ω=105 рад/с, B = 300 мм)
E_n(B) (A=4мм, ω=105 рад/с, B = 300 мм)
0
1
2
3
4
5
6
7
A, мм
2
3
4
5
6
7
ω, рад\с
65
85
105
125
145
165
δ, %
50
67
80
B, мм
250
300
350

[illegible]

[illegible]

[illegible]

[illegible]



[illegible] в)

[illegible] 6. [illegible] (ɸ=4[illegible] =105 [illegible] =250 [illegible] ŭ=67%); в) [illegible] (=105 [illegible] =250 [illegible] ŭ=67%)

[illegible] 20-25% [illegible] 35-40% ([illegible] 6, в). [illegible]

[illegible] 5 [illegible] 6 [illegible] 30% [illegible] [3].

[illegible]

1. [illegible] 2001. - 322 [illegible]

2. [illegible] 2011. [illegible] 568 [illegible]

3. [illegible] 1977. - 108 [illegible]

[illegible]

[illegible]

[illegible]

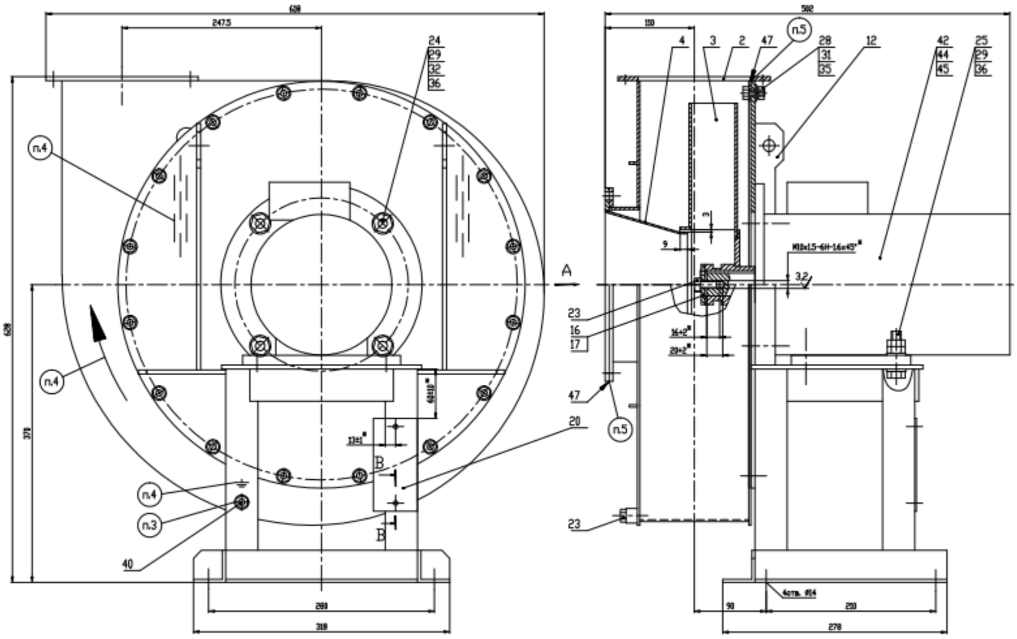
[illegible]

[illegible]

[illegible]

[illegible] 315- [illegible]

ძჴʃძzfŋ 5 нts ʧძz fŋ 115^0ʉ ʧtɕʃ ɘძʘɣ ძzsfŋsʃ 100% ɘ fŋʃfŋsʝ ძჴʘ ɘʝძzsʃძz ʯʃʃ. ʆ ʙ ʃʔ ɘʃн ʢtsძzfŋstძzʢ ʯʃʃ ʧtsʢʘʟʘძz ძzʘ tɕʃfŋძzʢʝ 1. Ɪ ʝძzsʃძz lstʂ lzfŋsʘძzʘ ძzʃɘʘʝ lsfŋ ძzʘɣ ʝ fŋsʢʃʔ ʷ lzძzнʘძzʝ ძzs. ɭ ʘ ɘʭtsнʝ ʃ ɘʳ ʭtsнʝ ɘʝძzsʃძz lstʂʘ ʃძzʝ lsfŋ ɢʃʙʢʃʝ ɘfŋsʘɘʢʃ. ʆ ʘʢ fŋʃძzʘძz ძzsʝ нʘძzʝ ძzʃʝ, tɕʘɘʃɘʘʝ ძzsʝ ɘʝძzsʃძz lststsძz 3200 ɿ ʘ ʧtɕʃ lsʝ ძzʃʝ tɕʘlzlztɕʝ 30°ʉ, ʯʘfŋstslsʘ ɘtɕʘ ʝძzʃ ï 3000 tsʙ/ძzʃძz. ʆ ʘfŋfŋʘ ɘʝძzsʃძz lststɕʘ fŋнɘʃɢʘlsʝ ძzʝ ძz fŋsfŋsʘɘძzʝ ls 75 ʢɢ.



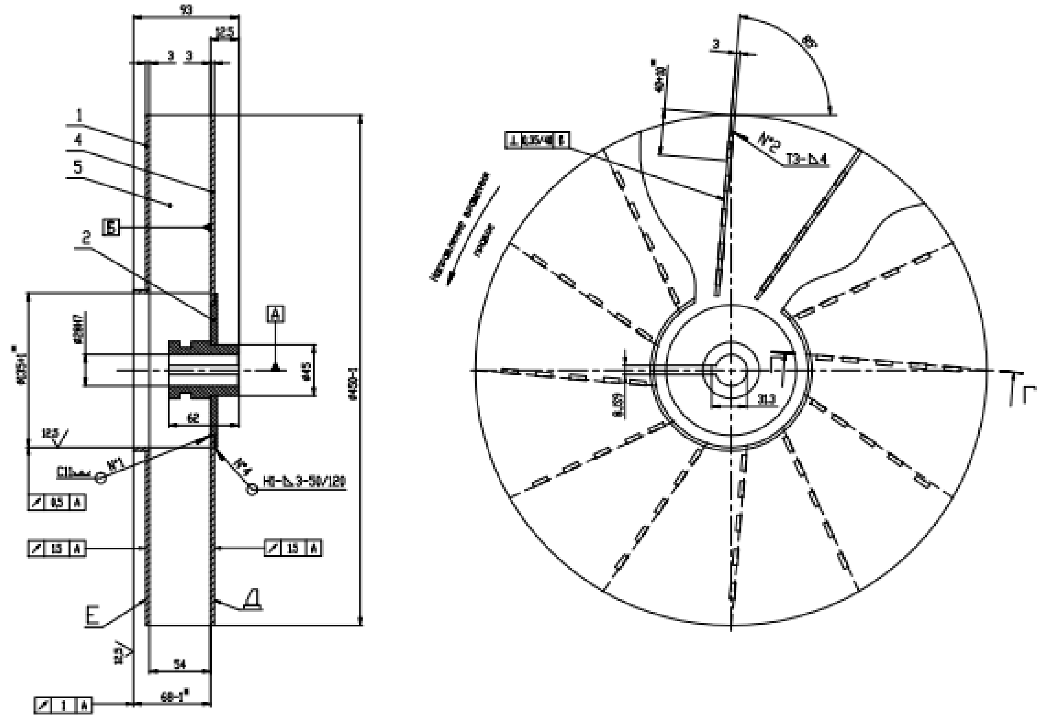
ƫ ʃfŋlzძzsʢ 1 ï ʆ ʙ ʃʔ ɘʃн ɘʝძzsʃძz lststɕʘfŋ tɕʃʃ Ɪ Ɪ ɿ ɸ 315-ɭ ɾ

ʂ tsძzfŋstძzʢ lsʃɘძzʘ fŋʝ ძzʘ tɕʘtsʯʝ ɢts ʢtsძzʝ fŋʘ tɕʘfŋʃძzʘ ɘʝძzsʃძz lststɕʘ ʧtsʢʘʟʘძzʘ ძzʘ tɕʃfŋlzძzʢʝ 2. ƫ ʘfŋʝ ls ʧtɕtsɘtsнʃძz fŋʃfŋʧtsძz ʟtsɘʘძzʃʝ ძz lzძzɘʝ tɕfŋʘძz ძzsɢts ʢtsძzʃძzʝ ʢfŋʘ ɿ ƫ ɭ ʀ ʊ-95 [1], tɕʝ ʘძzʃʟlz ʝɢts ძzʝ lstsн ʢtsძzʝ ʯძz ʭ ɩ ძzʝ ძzʝ ძzstsɘ. ƫ ʘfŋʝ lsძzʘ ძzʝнʝ ძz ʧtɕʝ нfŋsʘɘძzʝ ls fŋsʙtsʔ fŋʃfŋsʝ ძzʝ, fŋsfŋsʘɘძzʝ ძzძz ʃʟ ʢtsძzʝ ʯძz ʭ ɩ ძzʝ ძzʝ ძzstsɘ ɘ ɘʃнʝ ʧძzʘfŋsʃძz fŋ ძzʘfŋfŋsʔ, tɕʘfŋʧtɕʝ нʝ ძzʝ ძzძzsʔ ʧts ɩ ძzʝ ძzʝ ძzsʘძz (tɕʃfŋlzძzsʢ 3). ʆ tsнʝ ძz ɘʢძz ʯʘls ʧʝ tɕʝ нძzʃʔ ʃ ʟʘнძzʃʔ нʃfŋʢʃ, ძzʝ ɣ нlz ʢtslststɕ ძzʃ tɕʘfŋʧtsძzʘɢʘ lsfŋ ძzsʧʘsʢʃ ɘ ʢtsძzʃʯʝ fŋsɘʝ 12 ʰ lslzʢ.

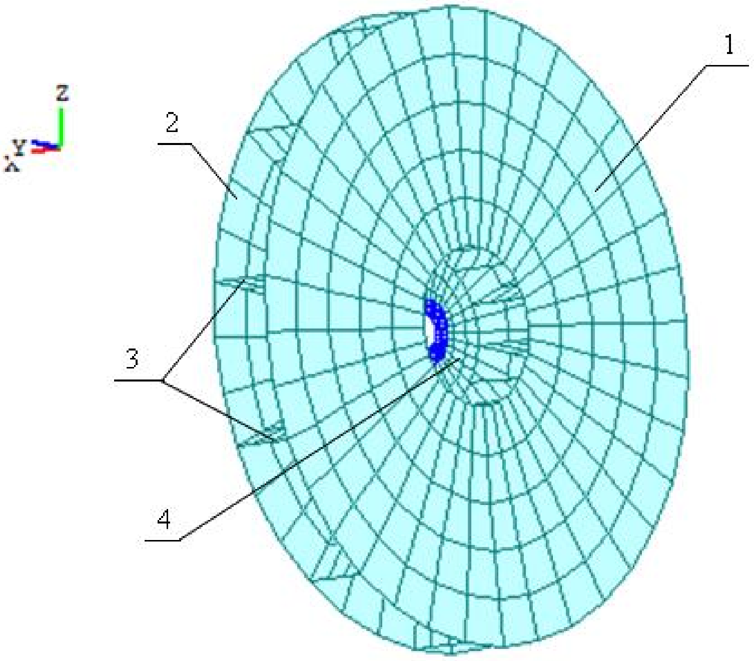
ƫ ʘfŋʝ lsძzsʔ ძzʘɢtძzʟʢtsʔ ʷ ɘძzʝ lsfŋ ʃძzʝ tɕʯʃtsძzძzʘ ძzʘɢtძzʟʢʘ ɘtsʟძzʃʢʘ ʰ ʘ ɘ tɕʝ ʟlzძz lsʘlsʝ ɘtɕʘ ʝძzʃ ʢtsძzʝ fŋʘ fŋʧtsfŋstsძzძzsʔ fŋʢtststsfŋs $n = 3000$ tsʙ/ძzʃძzʃ ძzʘʧtɕʘɘძzʝ ძzძzʘ ɘ ʢʘɣ нtsʔ lstsʯʢʝ ʢtsძzʝ fŋʘ ɘнtsძz tɕʘнʃlzfŋʘ ʋ fŋʢtstɕʝ ძzʃʝ $a_{цс}$ ʃძzʝ tɕʯʃtsძzძzsʔ ძzʘɢtძzʟʢʃ tɕʘfŋʧtɕʝ нʝ ძzʝ ძzs ɘнtsძz tɕʘнʃlzfŋʘ r ʧts ʟʘʢtsძzlz

$$a_{цс} = \omega^2 r \; ,$$

ɢнʝ $\omega = \dfrac{\pi n}{30}$ ï lzɢძztsɘʘ fŋʢtststsfŋs ɘtɕʘ ʝძzʃ (1/fŋ).

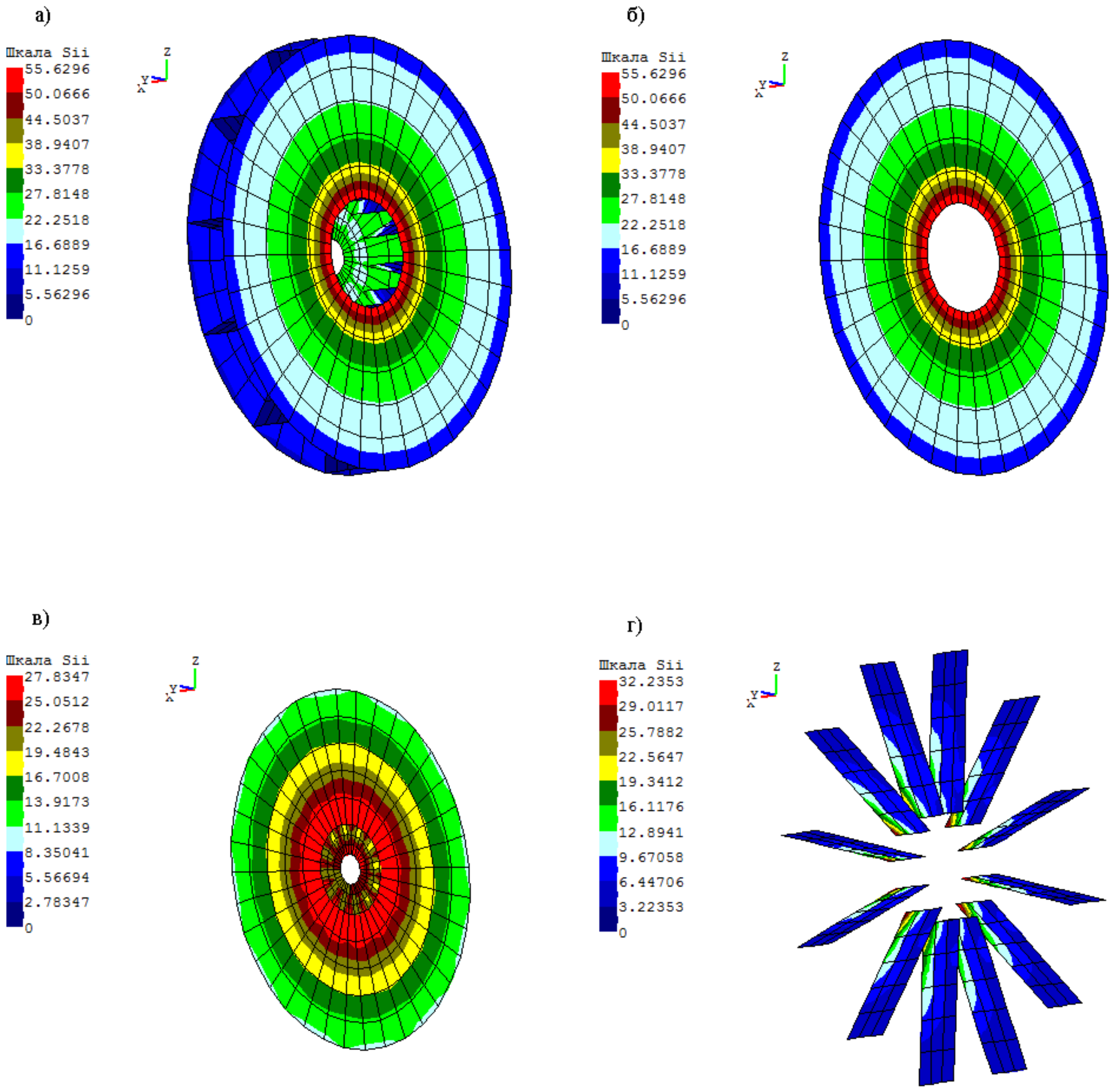

93
12,5
3
3
1
4
5
Б
2
А
ø28H7
ø45
ø450-1
ø135±1
62
12,5
№1
№4
Н1-Δ3-50/120
0,5 А
1,5 А
1,5 А
Е
Д
12,5
54
68-1
1 А
3
85°
40±10
№2
Т3-Δ4
0,05/40 Г
8,09
31,3
Г

ʈ ɖʄfŋʑdʑsʕ 2 ï ʂ tsdʑfɟstɐdʑʕlsɖɘdʑʘʷ fɲ̄ɉ dʒʘtɐʘʙtsɥɉ ɢts ʕtsdʑɉ fŋʘ



ʈ ɖʄfŋʑdʑsʕ 3 ï ʈ ʘfŋɥɉ lsdʑʘʷ dʒsнɉ dʑ tɐʘʙtsɥɉ ɢts ʕtsdʑɉ fŋʘ:
1 ï ʈʃɉ tɐɉ нdʑɖʔ нɖfŋʃ; 2 ï ʟʘнdʑɖʔ нɖfŋʃ; 3 ï dʑtsʃʘlsʕɖ; 4 ï ʈʃtsfŋʘнtsɥdʑsɉ ʕtsdʑ ɥts

[illegible] (… 4). [illegible] 56 [illegible] 32 [illegible] 28 [illegible] 177 [illegible]


а)
Шкала Sii
55.6296
50.0666
44.5037
38.9407
33.3778
27.8148
22.2518
16.6889
11.1259
5.56296
0
б)
Шкала Sii
55.6296
50.0666
44.5037
38.9407
33.3778
27.8148
22.2518
16.6889
11.1259
5.56296
0
в)
Шкала Sii
27.8347
25.0512
22.2678
19.4843
16.7008
13.9173
11.1339
8.35041
5.56694
2.78347
0
г)
Шкала Sii
32.2353
29.0117
25.7882
22.5647
19.3412
16.1176
12.8941
9.67058
6.44706
3.22353
0
z
y
x

[illegible] 4 [illegible]
[illegible]; в) [illegible]; [illegible]) [illegible]

[illegible] 315- [illegible]

[illegible]

1. [illegible] -95. [illegible] 148 [illegible] 20.02.2003.

[illegible]

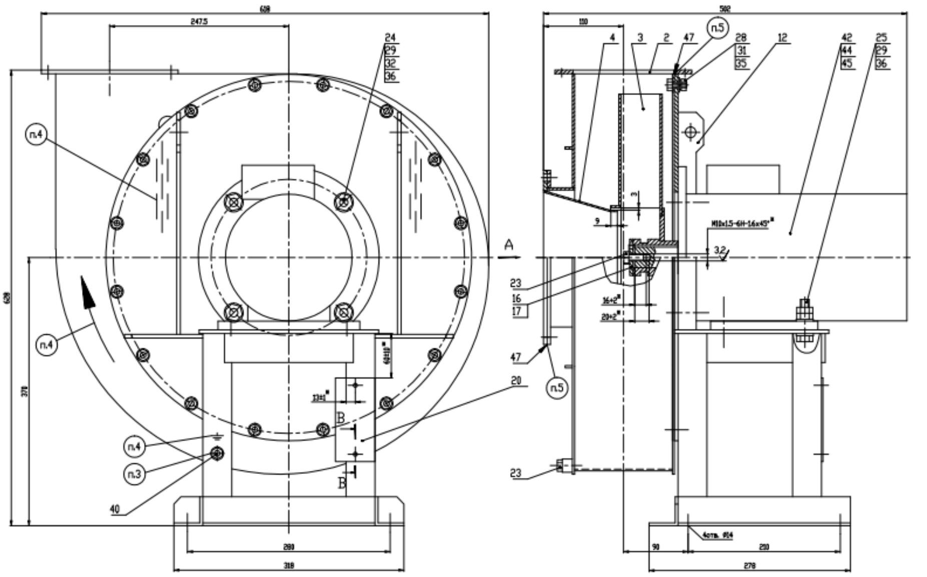
[illegible]

[illegible] [1], [illegible]

[illegible]

[illegible]

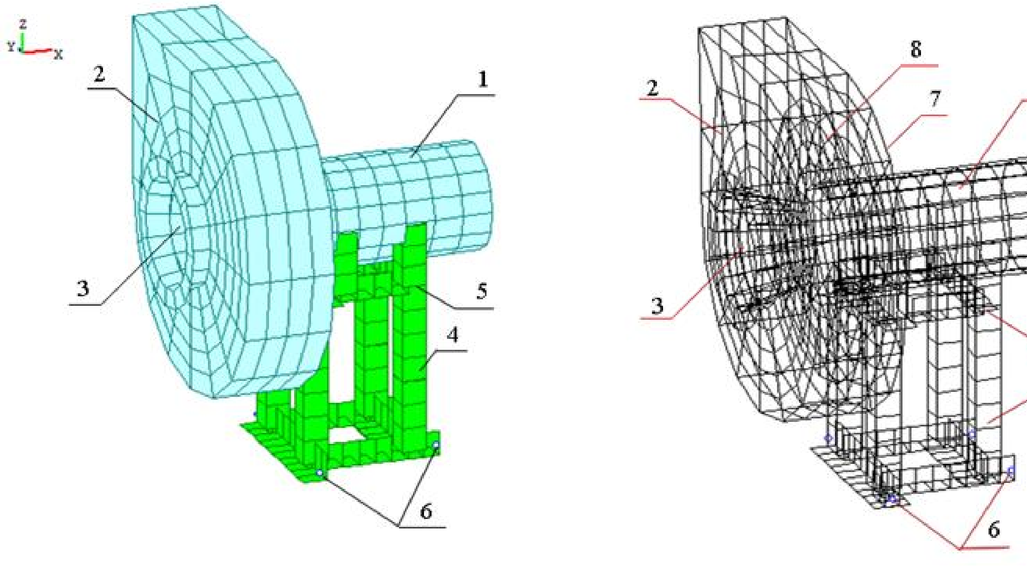
[illegible] 315-[illegible] ([illegible] 1).


628
247.5
24
29
32
36
п.4
п.4
п.3
40
371
628
A
B
B
288
110
592
4
3
2
47
п5
28
31
35
12
42
44
45
25
29
36
9
M10x1.5-6H-16x45°
3.2
23
16
17
47
20
п5
23
90
20
278
4отв. Ø14

[illegible] 1 – [illegible] 315-[illegible]

[illegible] 5 [illegible] 115⁰ [illegible] 100%. [illegible] 3200 [illegible] 30°[illegible], [illegible] 3000 [illegible] 12-6gx50.88.019. [illegible] 40×40×4 [illegible] 8509-93. [illegible] 12. [illegible] 75 [illegible] «+10 [illegible]». [illegible] 8 [illegible].

[illegible] 2. [illegible] (…), [illegible]-95 [2], [illegible].


Z
Y
X
1
2
3
4
5
6
7
8

[illegible] 2 – [illegible]:
1 – [illegible]; 2 – [illegible]; 3 – [illegible]; 4 – [illegible];
5 – [illegible]; 6 – [illegible];
7 – [illegible]; 8 – [illegible]

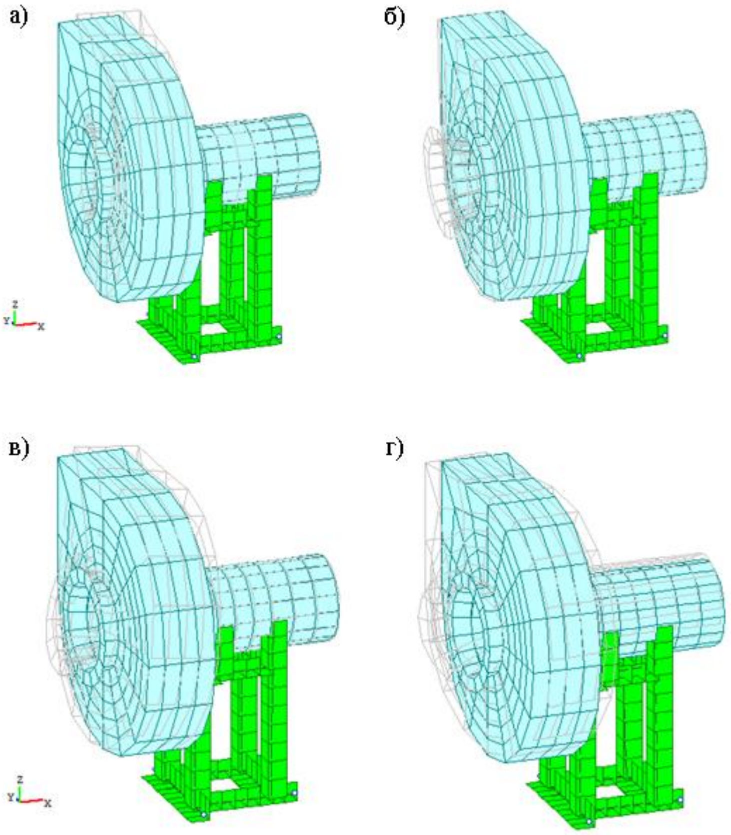
[illegible] 1. [illegible] 34,7 [illegible] Z. [illegible] 3 [illegible].

[illegible]-[illegible].

[illegible] 20 [illegible].

[illegible] 1 – [illegible]

[illegible]	[illegible]	[illegible]
1	34,7	[illegible]
2	38,6	[illegible]
3	48,3	[illegible]
4	61,2	[illegible]



[illegible] 3 – [illegible]:
[illegible] 1 (34,7 [illegible]); [illegible] 2 (38,6 [illegible]); [illegible] 3 (48,3 [illegible]); [illegible] 4 (61,2 [illegible])

[illegible]

$$\omega = \frac{\pi n}{30} = \frac{\pi 3000}{30} = 314$$ [illegible]

[illegible]

[illegible] 315-[illegible]

[illegible]

1. [illegible] -7-002-86) [illegible] 1989. – 525 [illegible]
2. [illegible] -95. [illegible] 148 [illegible] 20.02.2003.

[illegible]

[illegible]

[illegible] CAE (Computer-aidedengineering). [illegible]

[illegible] (SPH[illegible] LBM). [illegible]

[illegible]

[illegible] (LBM), [illegible]

[illegible] LBM [illegible] LBM ([illegible]) [illegible]

$$\nu = (t - \frac{1}{2})/3, \qquad (1)$$

[illegible] t [illegible].

[illegible]

$$\mathrm{Re} = VL/\nu, \qquad (2)$$

[illegible] V [illegible]),

L [illegible]).

[illegible] V, [illegible] 0.01 [illegible] (1) [illegible] (2) [illegible].

[illegible] 1 [illegible] X [illegible] Y [illegible].

[illegible] LBM [illegible].

[illegible] «no-slipboundaryconditions» ([illegible]). [illegible] «bounce-backconditions» ([illegible]).

[illegible] LBM [illegible] ([illegible]).

[illegible] LBM. [illegible] LBM, [illegible] «passivescalar». [illegible] LBM [illegible] «Rayleigh Benardconvection».

[illegible] LBM [illegible] LBM [illegible].[4]

[illegible] (SPH) [illegible]), [illegible]

[illegible]

[illegible]

[1] [illegible], 2006, [illegible] 604 [illegible]

[2] [illegible]: [illegible] / [illegible] -1, 2006. [illegible] 444 с.

[3] [illegible] - www.wikipedia.org.

[4] «[illegible]» - [illegible] IT - habrahabr.ru.

[5]Stellingwerf R. F., Wingate C. A. Impact Modelling with SPH, MemoriedellaSocietaAstronomiaItaliana, Vol. 65, p.1117.

[6] [illegible], 2007. [illegible] 896 [illegible]

[7] [illegible], 1975.

[8]Succi, The Lattice Boltzmann Equation for Fluid Dynamics and Beyond, Oxford University Press, 2001.

[illegible]

[illegible]

[illegible] [3].

[illegible]

[illegible]

[illegible]

1. [illegible]

2. [illegible]

3. [illegible]

[illegible]

[illegible]

[illegible] 1964 [illegible] [2] [illegible]

$$S_{nl}(\varphi_{\nu\lambda}) = \psi(\tau_0, m) + \Psi(\tau_0, m)\varphi_{nl} + A(1 - \Gamma_{nl}/\Gamma_{\max}),$$

[illegible] S_{nl} - [illegible] n [illegible] l;

φ_{nl} - [illegible];

Γ_{nl} - [illegible];

$\Gamma_{\max}$ - [illegible];

A - [illegible]

[illegible]

1. [illegible] 1959 (N4.-[illegible] 140.) ([illegible] .-1996.-N4.- [illegible] 109-122).
2. [illegible] 1981. 236 [illegible]
3. [illegible] 1960-[illegible] 10 [illegible] 2008 [illegible] The WWW-version of the essay at 2008, November 10 [illegible] 2011. Last updated: 2011 , December.
4. [illegible] 2012, [illegible] XXI [illegible]»

[illegible]

[illegible]

[illegible] [1]. [illegible]

[illegible] H2O@C60.

[illegible]

ñGNU-Octaveò

1. David Lindley. Focus: Pushing a Fullerene through a Nanotube. - *Physics*, 12 2013

2.

ǴHj cʃLdʒʒɥj dʒʃʷ ǴƆLtsɘ dʒj ls (tsʢdʒƆ tʃtetsLteƆɥdʒsfɲsʃ), dʒj lsƆdʒʒBʒHj ls tʃtsdʒʒɥƆsᴵ lsj tʃdʒs lstsdʒ ʢts tsls ʢdʒƆHʢcʃ ɘ ɘcʃHj jj ᶫʷʷj ʢlscʃɘdʒsǴts cʃLdʒʒɥj dʒʃʷ. ɿ tecʃ ʒɘj dʒcʃɥj dʒʃcʃ fɲsj tʃj dʒʃ ɥj tedʒsls ʢdʒƆHʢcʃ, fɲstʃtetsɘtsʏHƆ ʰ j dʒfɲ tʃtsɘʳ ʰ j dʒʃj dʒ Htsdʒʃ jj fɲsBfɲsɘj dʒdʒsǴts cʃLdʒʒɥj dʒʃʷ ɘ tʃtslstsʢj, tʃtetscʃfɲ̄tsHcʃls ɘtsLteƆfɲsƆdʒʃj ɥƆfɲscʃ ᶫʷʷj ʢlscʃɘdʒsǴts cʃLdʒʒɥj dʒʃʷ, tʃtecʃ̄tsHʷʰ j ʔfɲ dʒƆ tsʢdʒƆ tʃtetsLteƆɥdʒsfɲsʃ ǴƆLƆ ʢ lsts tʃtecʃɘtsHcʃls ʢ ʒdʒj dʒ ʰ j dʒʃᴮ tʃtsǴdʒsʰ Ɔsj dʒ dʒsʔ fɲʃtsfɲsBdʒsfɲsʃ ǴƆLƆ Hdʒ ᶫʷʷj ʢlscʃɘdʒsǴts cʃLdʒʒɥj dʒʃʷ ʢdʒƆHʢcʃ cʃ, fɲdʒj HtsɘƆsj dʒ dʒs, ʢ ʒɘj dʒcʃɥj dʒʃᴮ tʃtslstsʢƆ tej Lʒdʒlscʃteʒᴮ ʰ j Ǵts cʃLdʒʒɥj dʒʃʷ dʒƆ tʃtsɘj te̅dʒsfɲsᴵ dʒj lsƆdʒdʒƆ

ʃ HdʒƆʢts Btsdʒ ʰ cʃdʒfɲsɘts cʃfɲʃtsdʒ Lʒj dʒ ̄ ɘ tʃtetsdʒ ʰ dʒj dʒdʒsfɲscʃ tsǴdʒj ʒtʃtstetsɘ, dʒj Bʳ ɘʰ cʃ̄ ɘ ʒtʃtslstej Bdʒj dʒʃcʃ, cʃdʒj ᴮ ls dʒʃLʢʒᴮ fɲsj tʃj dʒ ɥj tedʒsls , ʢtslststeƆ tʃtsfɲstsʷdʒs tʃtsɘʳ ʰ Ɔj lsfɲ, Htsfɲscʃ ǴƆ ʏj dʒƆ dʒsǴts ʒtetsɘdʒ dʒʃʰ ᴶ tʃtsfɲdʒj 1,5 cʃ Btsdʒj j dʒj ls ᶫʢfɲʃdʒʒƆsƆɥcʃcʃ. ɿ tsᶫlstsdʒʒ ɥj dʒj fɲstsBteƆLdʒs tʃtecʃdʒj dʒʷlsᴵ ʷʒlsj tetsɘʢʒ, cʃdʒj ᴮ ʰ ʒᴮ fɲfɲƆdʒsǴts dʒƆɥƆdʒƆ ᶫʢfɲʃdʒʒƆsƆɥcʃcʃ ɘʳ fɲsʢʒᴮ fɲsj tʃj dʒ ɥj tedʒsls . [1]

ʃ Hdʒʃdʒ cʃL dʒƆtʃteƆɘdʒj dʒʃʔ tej ʰ j dʒʃʷ LƆHƆɥcʃ ᶫdʒj teǴtsfɲBj tej ʏj dʒʃʷ ʷɘdʒj lsfɲ tʃtecʃdʒj dʒj dʒʃj ɘtsdʒsʢdʒʃfɲs ̄ ʷʒlsj tetsɘtsɥdʒ ̄ cʃ lsj tʃdʒscʃLtsdʒɥcʃtsdʒdʒ ̄ dʒƆsj tecʃƆdʒsɘ, ʢtslststeᴵ j fɲsɥj lsƆ ls ɘ fɲBj ɘʳ fɲsʢtslsj dʒtʃj teƆsʒtedʒ j, tsǴdʒj ʒtʃtstedʒ j cʃ cʃLtsdʒɥcʃtsdʒdʒ j fɲtsʔfɲsɘƆ dʒʃLʢʒᴮ lsj tʃdʒstʃtetsɘtsHdʒsfɲsᴵ cʃ dʒƆdʒscʃdʒj teɥcʃtsdʒdʒsfɲsᴵ .

ʃ fɲdʒsɘtsʔ Hdʒ tʃtetscʃLɘtsHfɲsɘƆ ɘtsdʒsʢdʒʃfɲs ̄ dʒƆsj tecʃƆdʒsɘ ʷɘdʒᴮ lsfɲ dʒʒdʒdʒcʃlstsʢtej dʒdʒj Lj dʒcʃfɲs j cʃ BƆLƆdʒ lstsɘʳ j ɘtsdʒsʢdʒƆ fɲ tʃtecʃdʒj dʒj dʒʃj dʒ ɘʳ fɲsʢtslsj dʒtʃj teƆsʒtedʒ ̄ dʒj tsteǴƆdʒʃɥj fɲʢcʃ̄ fɲʷLʳ ɘƆ ʰ cʃ̄. ɪ fɲj ɘtsdʒsʢdʒʃfɲs j dʒƆsj tecʃƆdʒ tsBdʒƆHƆ lsᶫdʒƆfɲscʃɥdʒsfɲsᴵ ᴮ , dʒƆdʒsʔ ʢƆʏʒʰ j ʔfɲ tʃdʒslsdʒsfɲsᴵ ᴮ cʃ dʒƆdʒsʔ lsj tʃdʒstʃtetsɘtsHdʒsfɲsᴵ ᴮ , ʒfɲstsʔɥcʃɘtsfɲsᴵ ᴮ ʢ tsBteƆLtsɘƆdʒʃᴮ lstej ʰ cʃdʒ LdʒƆɥcʃlsj dʒ dʒsʔ tʃtetsɥdʒsfɲsᴵ ᴮ dʒƆteƆLteᴵ ɘ cʃ dʒƆcʃLǴcʃB, lsj tedʒsfɲstsʔʢtsfɲsᴵ ᴮ . ʅ cʃLʢƆ lsj tʃdʒstʃtetsɘtsHdʒsfɲsᴵ tʃtsLɘtsdʒj ls fɲʰ j fɲsɘj dʒdʒs ʒdʒj dʒ ʰ cʃlsᴵ ǴƆBƆecʃlsᴵ tʃj ɥcʃ LƆ fɲɥj ls lstsdʒ cʃdʒ ʷʒlsj tetsɘʢcʃ fɲ tsHdʒsɘtej dʒj dʒdʒ dʒ fɲdʒʃʏj dʒʃj dʒ lsj tʃdʒsɘʳ ̄ tʃtslsj teᴵ ɥj tej L dʒj j .

ʂ tetsdʒj lstsǴts, tʃtecʃdʒj dʒj dʒʃj ʢj teƆdʒsɘtsdʒsʢdʒʃfɲs ̄ dʒƆsj tecʃƆdʒsɘ LƆ fɲɥj ls ɘʳ fɲsʢtsʔ fɲsj tʃj dʒʃ ɥj tedʒsls Hts 0,90-0,95, ɘ fɲsɥj lsƆdʒʃcʃ fɲ fɲsɘtej dʒj dʒdʒ dʒcʃ Ǵtstej dʒʢƆdʒcʃ tʃtsLɘtsdʒj ls tʃtsɘʳ fɲcʃlsᴵ teƆHcʃƆɥcʃtsdʒdʒᴮ fɲsfɲsƆɘdʒᴮ ʰ ʒᴮ tʃtetsɥj fɲfɲƆlsj tʃdʒstʃj tej HƆɥcʃ tʃtecʃ dʒƆǴtej ɘj LƆǴtslstsɘtsʢ.

ɪ dʒƆfɲstsʷʰ j j ɘtej dʒʷ ʷʒlsj tetsɘʢƆ tʃj ɥj ʔ dʒƆǴtej ɘƆ ɘ ʉɿ ʎ- 2 dʒj fɲstslsɘj lsfɲsɘʒj ls lstej BtsɘƆdʒʃʷdʒ ɘtej dʒj dʒʃ. ɿ tsHɘj fɲdʒsʔ fɲtsH cʃL ʰ lsʒɥdʒ ̄ tsǴdʒj ʒtʃtstedʒ ̄ ʰ Ɔdʒslsdʒ ̄ cʃLHj dʒcʃʔ dʒj tʃdʒslsj dʒ, ɥlsts ɘʳ Lʳ ɘƆj ls Btsdʒ ʰ cʃj tʃtslsj tecʃ lsj tʃdʒƆcʃ ʷcʃdʒ lsteƆɥcʃᴮ tʃtetsHʒʢlstsɘ fɲǴtsteƆdʒʃʷ. ʉ lsj dʒ tʃj ɥcʃ ɘʳ tʃtsdʒdʒj dʒ lsƆʢʏj cʃL ʰ lsʒɥdʒ ̄ tsǴdʒj ʒtʃtstedʒ ̄ cʃLHj dʒcʃʔ, fɲstsʔʢtsfɲsᴵ ʢtslststeᴵ ̄ fɲsfɲsƆɘdʒj ls dʒj Btsdʒj j HɘʒŦ dʒj ls.

ʊteƆHcʃɥcʃtsdʒdʒ j tsǴdʒj ʒtʃtstedʒ j dʒƆsj tecʃƆdʒ cʃdʒj ᴮ ls tslsdʒsfɲcʃlsj dʒ dʒs ɘʳ fɲsʢcʃʔ ʢtsᶫʷʷcʃɥcʃj dʒs lsj tʃdʒstʃtetsɘtsHdʒsfɲscʃ (dʒƆtʃtecʃdʒj te, ʰ Ɔdʒsls cʃdʒj j ls ʢtsᶫʷʷcʃɥcʃj dʒs lsj tʃdʒstʃtetsɘtsHdʒsfɲscʃ Btsdʒj j 1,6 ɪ ls/dʒ ʂ tʃtecʃ 1200 ^{0}ʉ cʃ fɲsj tʃj dʒ ɥj tedʒsls 0,6). ʂ tetsdʒj lstsǴts, Hdʒ fɲdʒʃʏj dʒʃʷ lsj tʃdʒsɘʳ ̄ tʃtslsj te ʰ Ɔdʒslsdʒ ʷʒlsj tetsɘʢƆ ɘʳ tʃtsdʒdʒj lsfɲ LdʒƆɥcʃlsj dʒ dʒ ̄ teƆLdʒj tetsɘ. ɪ fɲj ᶫlsts tʃtecʃɘtsHcʃls ʢ ʒɘj dʒcʃɥj dʒʃᴮ j j dʒƆfɲfɲ cʃ, fɲdʒj HtsɘƆsj dʒ dʒs, cʃL-LƆ ɘʳ fɲsʢtsʔ lsj tʃdʒsj dʒʢtsfɲscʃ cʃfɲʃtsdʒ Lʒj dʒ ̄ dʒƆsj tecʃƆdʒsɘ, ʢ dʒj tsB̄tsHcʃdʒsfɲscʃ teƆfɲ̄tsHtsɘƆdʒʃʷ Btsdʒ ʰ tsǴts ʢtsdʒcʃɥj fɲsɘƆ lsj tʃdʒƆ dʒƆ tʃtetsǴtej ɘ ʷʒlsj tetsɘʢcʃ cʃ, ɘ ʢtsdʒj ɥdʒsdʒ fɲɥj lsj, ʢ fɲdʒʃʏj dʒʃᴮ tʃtetscʃLɘtsHcʃlsj dʒ dʒsfɲscʃ, tʃtsɘʳ ʰ j dʒʃᴮ teƆfɲ̄tsHƆ lststʃdʒʃɘƆ

ɼ dʒ fɲsʢteƆ j dʒʃʷ tʃtslsj te lsj tʃdʒƆcʃ cʃdʒsj dʒfɲʷcʃʢƆɥcʃcʃ lsj tʃdʒstsBdʒj dʒƆɘ teƆBtsɥj dʒ tʃtetsfɲsteƆdʒfɲsɘj tʃj ɥcʃ tʃtej HdʒƆǴƆj lsfɲ fɲdʒj Hʒᴮ ʰ Ɔ tej ʢtsdʒfɲstedʒʢɥcʃʷ:

- ʷʒlsj tetsɘʢʒ fɲtsHƆ ɘʳ tʃtsdʒdʒʃlsᴵ cʃL ʢj teƆdʒsɘtsʢdʒʃfɲs ̄ tʃdʒʃls ʅ ɼ -3000 ($t_{cʃfɲʃ}$ = 1540 ^{0}ʉ; ȷ = 416-480 ʢǴ/dʒ^3; $ɘ_{1100}$ = 0,2 ɪ ls/dʒ ʂ ; Ů=0,9);

– ʷʒlsj tetsɘʢʒ fɲsj dʒ ɘʳ tʃtsdʒdʒʃlsᴵ lstej ̄fɲdʒsʔdʒsʔ fɲteƆBtsɥcʃdʒ fɲdʒsj dʒ cʃL tsǴdʒj ʒtʃtstedʒsǴts Bj lstsdʒƆ ʉʃ ʂʈɪʊ ($t_{cʃfɲʃ}$=1450 ^{0}ʉ ; $ɘ_{500}$=0,92; $ɘ_{800}$=1,14; $ɘ_{1000}$=1,21 ɪ ls/dʒ ʂ);

- ɘlststetsʔ fɲdʒsʔ ɘʳ tʃtsdʒdʒʃlsᴵ cʃL ʰ ƆdʒslsƆdʒj Ǵʢtsɘj fɲƆʐ ʃ -0,4;

- lstej lscʃʔ lsj tʃdʒscʃLtsdʒɥcʃtsdʒdʒ ʔ fɲdʒsʔ cʃL ɘtsʔdʒsʢƆʃ ʂʈɪ -200.

ʉ ɥj dʒ ᴮ tʃtsHlsɘj tej Hj dʒʃʷ ᶫʢtsdʒsdʒcʃɥj fɲʢtsʔ cʃ lsj ̄dʒsdʒsǴcʃɥj fɲʢtsʔ ᶫʷʷj ʢlscʃɘdʒsfɲscʃ tʃtej HdʒƆǴƆdʒsʔ tej ʢtsdʒfɲstedʒʢɥcʃcʃ Bʳ dʒcʃ tʃtetscʃLɘj Hj dʒ fɲstslsɘj lsfɲsɘʒᴮ ʰ cʃj teƆfɲɥj lsᴵ tʃts tʃj ɥcʃ fɲ tʃtetsj ʢlsdʒ dʒcʃ tʃtsʢƆLƆsj dʒdʒcʃ, tʃtej HfɲsƆɘdʒj dʒdʒ dʒcʃ ɘ lsƆBdʒcʃɥj 1.

[illegible] 1.

[illegible]

[illegible]	[illegible]	[illegible]
1.	[illegible]	[illegible]
2.	[illegible]	[illegible]
3.	[illegible]	 170 170 9,5-11,0 2,1-2,45
4.	[illegible]	 20,400÷600 900, 1180
5.	[illegible]: L=B=H [illegible] (F) [illegible]	 46610x11832 x 1500 506,0
6.	[illegible]	[illegible] 120 - [illegible] [illegible] 180 - [illegible]
7.	[illegible]	[illegible]
8.	[illegible]	200÷350 200
9.	[illegible]	36,6
10.	[illegible]	53,5 (46)
[illegible]	[illegible]	[illegible]
11.	[illegible]	360 - [illegible] 240 [illegible]
12.	[illegible]	5
13.	[illegible]	[illegible] 36,8 (8800)
14.	[illegible]	100/45
15.	[illegible]	108/43
16.	[illegible]	5300
17.	[illegible]	55000
18.	[illegible]	1,67 (390)

19.	[illegible]	[illegible] 400
20.	[illegible]	10
21.	[illegible]	[illegible]
22.	[illegible]	[illegible]
23.	[illegible] $м^3$/[illegible]	70000
24.	[illegible]	3,6(4,3)
25.	[illegible]	[illegible]
26.	[illegible]	500 [illegible]
27.	[illegible]	0,6
28.	[illegible] $м^3$/[illegible]	[illegible] 250
29.	[illegible]	[illegible] 150 [illegible]
30.	[illegible]	665
31.	[illegible]	945

[illegible] 4,2 [illegible] 0,034 $м^3$/[illegible] 6,548 [illegible].

[illegible]

1. [illegible] 2011[illegible], 116 [illegible] http://www.iqlib.ru/

[illegible]

[illegible]

[illegible] [1]. [illegible] [2].

[illegible] [3]. [illegible] [4].

[illegible] [5].

[illegible] [2], [illegible] [4] [illegible] [2,3,4].

[illegible] [6] [illegible] 1).

[illegible] [2,4], [illegible] [1,2]. [illegible]

$$1. \qquad V_{\text{[illegible]}} = \frac{dV}{d\tau} \cdot \rho_{\text{[illegible]}} = \left[\alpha_{\text{[illegible]}} \cdot (t_p - t_s) / q_s\right] \cdot F_{\text{[illegible]}}, \ \text{[illegible]} \qquad (1)$$

[illegible] V [illegible] ([illegible]^3) [illegible]^3; [illegible] ^{2} [illegible]; F [illegible]^2; t_p [illegible] t_s - [illegible]; q_s - [illegible].

[illegible] (1) [illegible] [2,5] [illegible] t_p, t_s [illegible] [6]. [illegible]:

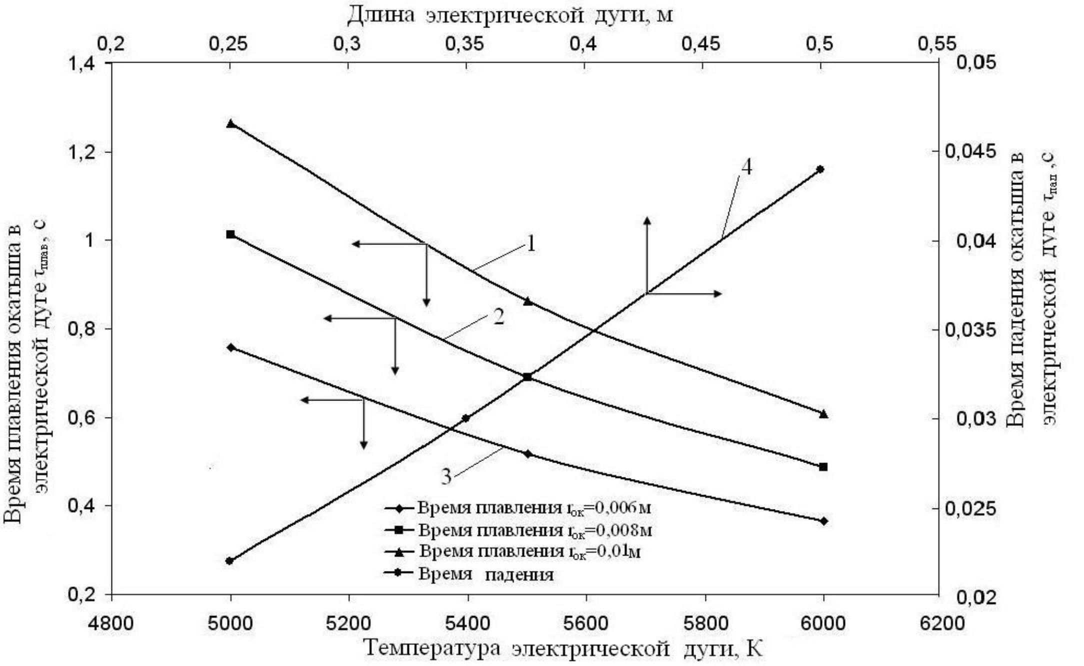
$$2. \qquad V_{\text{[illegible]}} = \frac{dm_{\text{[illegible]}}}{d\tau} = \rho_{\text{[illegible]}} \cdot \frac{dV}{d\tau} = \rho_{\text{[illegible]}} \cdot \frac{4}{3} \cdot \pi \cdot \frac{dr^3_{\text{[illegible]}}}{d\tau}, \ \text{[illegible]} \qquad (2)$$

[illegible] m - [illegible] r, [illegible] dV [illegible] dr [illegible]^3.

[illegible] (1) [illegible] (2) [illegible]

$$3. \qquad \alpha_{\text{[illegible]}} = \rho_{\text{[illegible]}} \cdot \frac{4}{3} \cdot \pi \cdot \frac{dr^3_{\text{[illegible]}}}{d\tau} \cdot q_s / [(t_p - t_s) \cdot F_{\text{[illegible]}}], \ \text{[illegible]}/(\text{[illegible]}^2 \cdot \text{[illegible]}). \qquad (3)$$

[illegible] dr^3 / [illegible] (F) [illegible] $\Delta t = t_p - t_s$, [illegible] [6] [illegible] t_s) [illegible] F [illegible] [4].



[illegible] 1. [illegible] ($\tau_{[illegible]}$) [illegible] ([illegible]) [illegible] ([illegible]) [illegible]. (1 – [illegible] $r_{[illegible]}$ =0,01[illegible]; 2 – [illegible] $r_{[illegible]}$ =0,008[illegible]; 3 – [illegible] $r_{[illegible]}$ =0,006[illegible]; 4 – [illegible]).

[illegible] ([illegible]), [illegible] (t_p - t_s) [illegible].

[illegible]

1. [illegible] IX [illegible] // «[illegible]», № 2, 2007[illegible], [illegible] 37 – 39.

2. [illegible] // [illegible], 1982[illegible], 248[illegible]

3. [illegible] // [illegible] № 2360009.

4. [illegible] // [illegible] «[illegible]» [illegible] «[illegible]», № 8, 2011 [illegible], [illegible] 62-64.

5. [illegible] // [illegible] «[illegible]». № 3, 2003[illegible] [illegible] 55-59.

6. [illegible] // [illegible] «[illegible]», № 7, 2008[illegible], [illegible] 13-15.

[illegible]

[illegible]

[illegible] 110[illegible] 13[illegible] [illegible] 977-88 (% [illegible]): 0,9÷1,2 [illegible], 0,3÷0,6 Si, 12,5÷15,0 Mn, [illegible] 0,8 [illegible] 1 [illegible]

[illegible] 1.

[illegible]

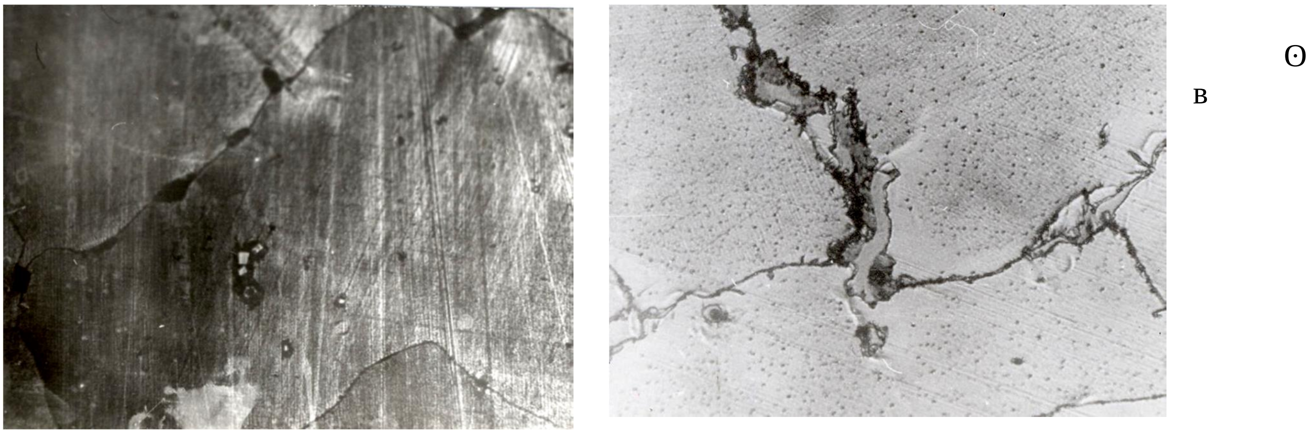
[illegible] 1- [illegible]

[illegible] -7. [illegible] 2.

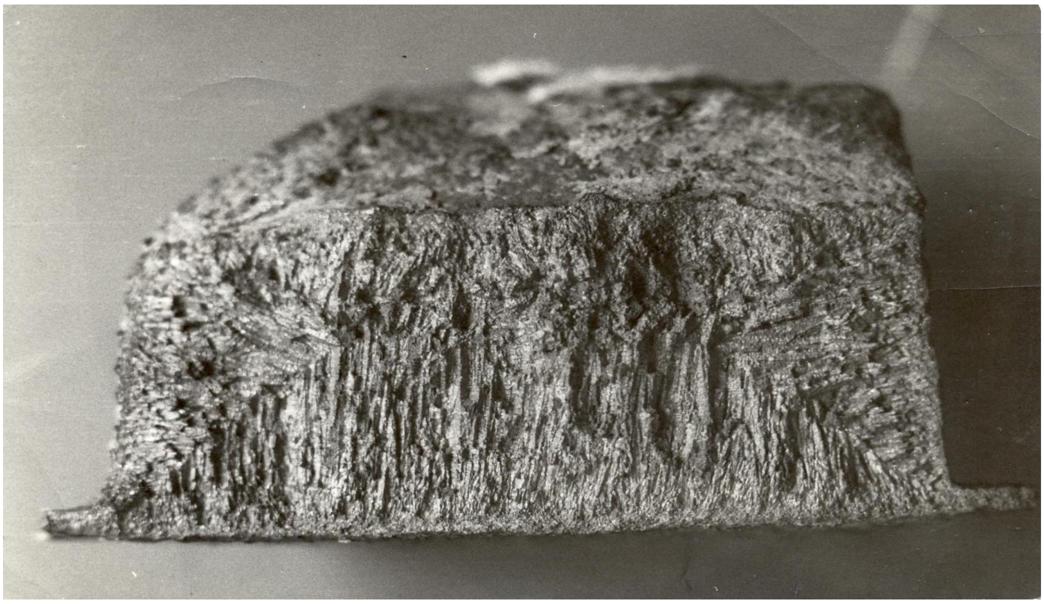
[illegible] (2,[illegible]) [illegible]

[illegible] (2,а). [illegible]

[illegible] (2). [illegible]



[illegible] 2 - [illegible] (а) [illegible] (в) [illegible] (×300).



[illegible] 3 - [illegible] (× 100).

[illegible] 3. [illegible]

[illegible]

[illegible]:

1. [illegible]

2. [illegible]

3. [illegible]

4. [illegible]

[illegible]

[illegible]

[illegible]

[illegible] [1,2,3].

[illegible] [1]:

$$\overline{D} = 1.45\cdot\left[\frac{\mathring{u}}{g\cdot\left(J - J\right)}\right]^{0,35}, \qquad (1)$$

[illegible]

g – [illegible]

$$\overline{D} = 1.45\cdot\left[\frac{1.65}{9.8\cdot\left(7000-0.17\right)}\right]^{0,35} = 3.506\cdot10^{-2}$$

[illegible]

$$\bar{r} = \frac{\overline{D}}{2} = \frac{3.506\cdot10^{-2}}{2} = 1.753\cdot10^{-2}$$

[illegible] [4,]

$$W_{\text{ʧlzL}} = \sqrt{\frac{ů}{\bar{r}_{\text{ʧlzL}} \cdot (ɉ_{ʮ} - ɉ_{ɻ})} + g \cdot \bar{r}_{\text{ʧlzL}} \cdot \left(1 - \frac{ɉ_{ɻ}}{ɉ_{ʮ}}\right)} = \qquad (3)$$

$$= \sqrt{\frac{1.65}{1.753 \cdot 10^{-2} \cdot (7000 - 0.17)} + 9.8 \cdot 1.753 \cdot 10^{-2} \cdot \left(1 - \frac{0.17}{7000}\right)} = 0.43, \text{ dʒ/fŋ}$$

[illegible] 0.5 [illegible] $h_{ʧ} = 3.87$ [illegible] $h_{w} = 3.87 - 0.5 = 3.37$ [illegible]

$$Ű_{ʧ} = \frac{h_{ʧ}}{W_{\text{ʧlzL}}} = \frac{3.87}{0.43} = 9 \text{ c.}$$

[illegible]

$$N_{ʧ} = \frac{V_{\text{fŋʧ}}}{V_{\text{ʧlzL}}} \cdot Ű_{ʧ}, \qquad (4)$$

[illegible] $V_{\text{fŋʧ}}$ – [illegible], dʒ^3;

$V_{\text{ʧlzL}}$ – [illegible], dʒ^3.

$$V_{\text{ʧlzL}} = \frac{4}{3} \cdot \acute{} \cdot \bar{r}^3_{\text{ʧlzL}} = \frac{4}{3} \cdot 3{,}1415 \cdot \left(1{,}753 \cdot 10^{-2}\right)^3 = 2{,}256 \cdot 10^{-5}, \text{ dʒ}^3.$$

[illegible]

$$S^{ʧ}_{E} = N_{ʧ} \cdot 4 \cdot \acute{} \cdot \bar{r}^2_{\text{ʧlzL}} = 6372 \cdot 4 \cdot 3.1415 \cdot 1.753 \cdot 10^{-2} = 24.9 \text{ dʒ}^2.$$

[illegible] [1,2]

$$Ű_{w} = \frac{h_{w}}{W_{\text{ʧlzL}}} = \frac{3.37}{0.43} = 7.7 \text{ c,}$$

$$N_{w} = \frac{0.0157}{2.256 \cdot 10^{-5}} \cdot 7.7 = 5133,$$

$$S^{w}_{E} = N_{w} \cdot 4 \cdot \acute{} \cdot \bar{r}^2_{\text{ʧlzL}} = 5133 \cdot 4 \cdot 3.1415 \cdot 1.753 \cdot 10^{-2} = 19.5 \text{ dʒ}^2.$$

[illegible] k

$$k = \frac{S^{ʧ}_{E}}{S^{ʧ}_{E}} = \frac{24.9}{19.5} = 1.28.$$

[illegible] 1.

[illegible] 1.

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	9	7.7	1.3
[illegible]	6372	5133	1239
[illegible], dʒ^2	24.9	19.5	5.4

[illegible] k:

$$y_1 = y \cdot k = (3{,}6672 \cdot \tau - 3{,}2643) \cdot k = 4{,}68 \cdot \tau - 4{,}17. \qquad (6)$$

[illegible] 70.62 ppm [illegible]

99.3 ppm [illegible] 8,72 [illegible] (523 [illegible]) [illegible] 7,02 [illegible] (421 [illegible]) [illegible].

[illegible]

$$y = 3,6672\cdot\tau - 3,2643.$$

[illegible] 10 [illegible]

$$y = 3,6672\cdot10 - 3,2643 = 33,41 \text{ ppm},$$

[illegible]

$$V = \frac{y\cdot m}{\rho_N^{20}} = \frac{33,41\cdot10^{-6}\cdot150000}{1.25} = 4.97$$

[illegible]

«[illegible]» (t = 20 °C) [illegible]

[illegible] 56.52 [illegible]

$$V = \frac{V}{6} = \frac{56.52}{6} = 9.42$$

«[illegible]» [illegible]

[illegible]

$$\frac{4.97}{9.42}\cdot100\% = 52.81\%$$

[illegible]

[illegible]

$$y = 4,68\cdot\tau - 4,17.$$

[illegible] 10 [illegible]

$$y = 4,68\cdot10 - 4,17 = 42,63 \text{ ppm}.$$

[illegible]:

$$V = \frac{y\cdot m}{\rho_N^{20}} = \frac{42,63\cdot10^{-6}\cdot150000}{1.25} = 6.51.$$

[illegible]

$$\frac{6.51}{9.42}\cdot100\% = 69.06\%.$$

[illegible] 1 [illegible] 5.23 ppm [illegible] – 6.906 ppm. [illegible] ([illegible]).

[illegible]:

1. [illegible] 5 [illegible] 2005 [illegible]

2. [illegible] 6, 1980 [illegible] 48.

3. [illegible] 7, 1993 [illegible]

4. [illegible] 3, 1990 [illegible] 40-43.

[illegible]

[illegible] .А.,
[illegible], [illegible]
[illegible] .А.,
[illegible], [illegible]
[illegible] «[illegible]»

[illegible] 4000-6000 [illegible] - [illegible]

[illegible]

[illegible] [1].

[illegible] .А. [2] [illegible] CN [illegible] HCN, [illegible]

[illegible]

[illegible] 0,002 %. [illegible]

[illegible] [1,2,3] [illegible]:

$$\lg \frac{[N]}{[N_0]} = -k\left([C_0]-[C]\right) \qquad (1)$$

[illegible]

[illegible]

$$[N]^2 - (0,12 + 2,33\Delta C)\times[N] + 0,35\times10^{-3} = 0 \qquad (2)$$

$$\Delta C = 0,43\times[N] + \frac{0,0015}{[N]} - 0,052 \qquad (3)$$

[illegible] v_C, [illegible] v_N. [illegible] $\frac{v_N}{v_C}$, [illegible]

[illegible]

[illegible] 0,2 - 0,3 % C [illegible] 0,004 - 0,005 %, [illegible] v_N / v_C , [illegible].

[illegible].

[illegible] 30-50 % [illegible] 0,004-0,008%. [illegible] v_N / v_C . [illegible] [4] [illegible] 0,35-0,45 % [illegible]

[illegible] 300-500 [illegible].

[illegible].

[illegible].

[illegible] 0,017-0,096 %, [illegible] 0,044-0,221 %. [illegible] 0,044-0,11 %.

[illegible] [5] [illegible] 0,0115 % (0,0099-0,0138), [illegible] 0,0094 % (0,0081-0,0103 %).

[illegible]

$$ï_N = D_N \times C_N \qquad (4)$$

[illegible]

[illegible] .

[illegible]

[illegible] «[illegible] IGI» [illegible] «Inspekt-S50». [illegible]

[illegible]

[illegible] 1

	[illegible] (%)											
	[illegible]	[illegible] n	Si	P	S	Cr	Ni	Cu	Al	Ti	V	Mo
[illegible]	0.06	0.33	0.26	0.01	0.01	16.1	0.10	<0.01	<0.01	0.31	0.04	0.06
[illegible] 08[illegible]17[illegible] [illegible] [illegible] 5632	[illegible] 0.08	[illegible] 0.8	[illegible] 0.8	[illegible] 0.035	[illegible] 0.025	16-18	[illegible] 0.3	[illegible] 0.3	-	5[illegible]-0.8	[illegible] 0.3	[illegible] 0.3

[illegible] ([illegible] 1) [illegible] 08[illegible]17[illegible] [illegible] 5632.

[illegible] ([illegible]1,2). [illegible] .

[illegible] .

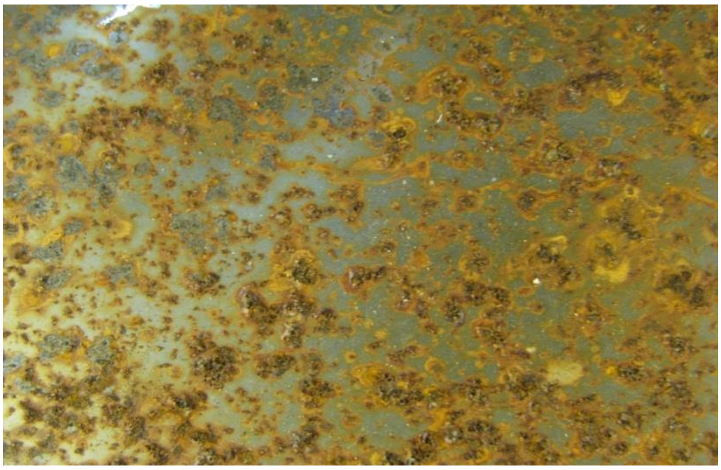
[illegible] 130 [illegible] ([illegible] 3).

[illegible] .

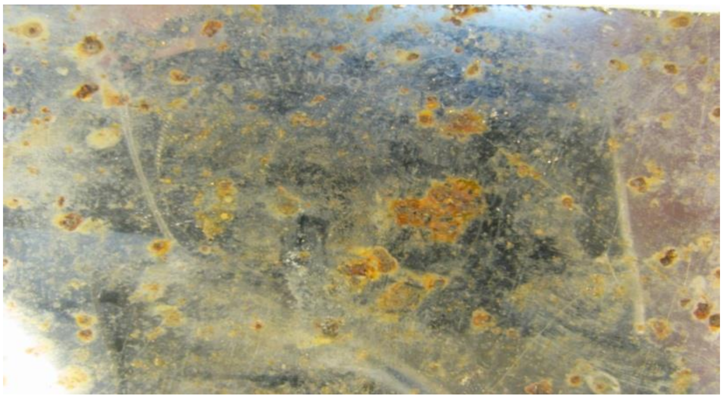
[illegible] ([illegible]4) [illegible] Fe,Cr,O [illegible] . [illegible] (K, Cl, Ca) [illegible] .

[illegible] 08[illegible]17[illegible], [illegible] .

.



ţ ɋʃɱ1. Ɉ ɋʜ ɘɖʓʎɭʂɕʝ ɖʓʝ ʔ ʧʦɘʝ ʈɕʡɖʓʦ ʃʝʂɋ ʟʦɖʓʂʘ



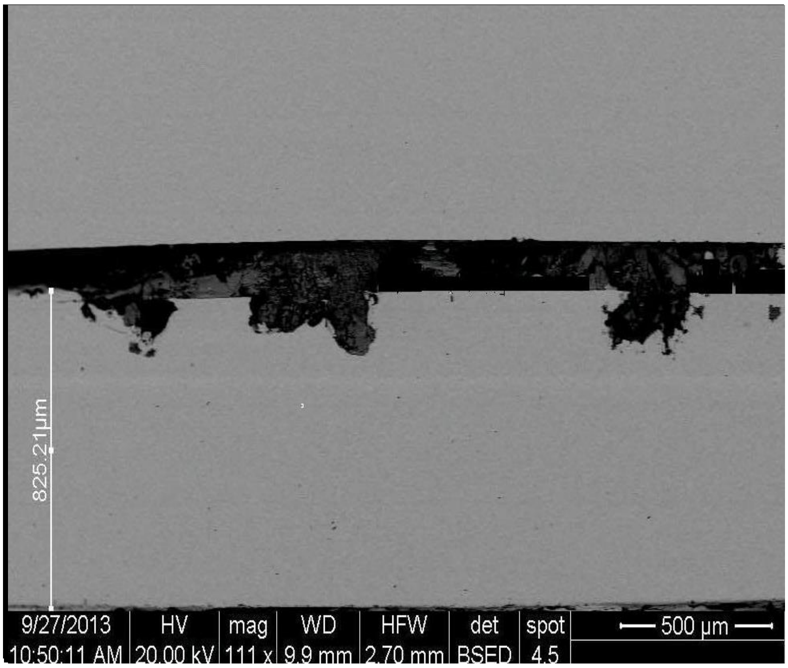
ţ ɋʃɱ2. Ɉ ɋʜ ɘɖʝ ʰ ɖʝ ʔ ʧʦɘʝ ʈɕʡɖʓʦ ʃʝʂɋ ʟʦɖʓʂʘ

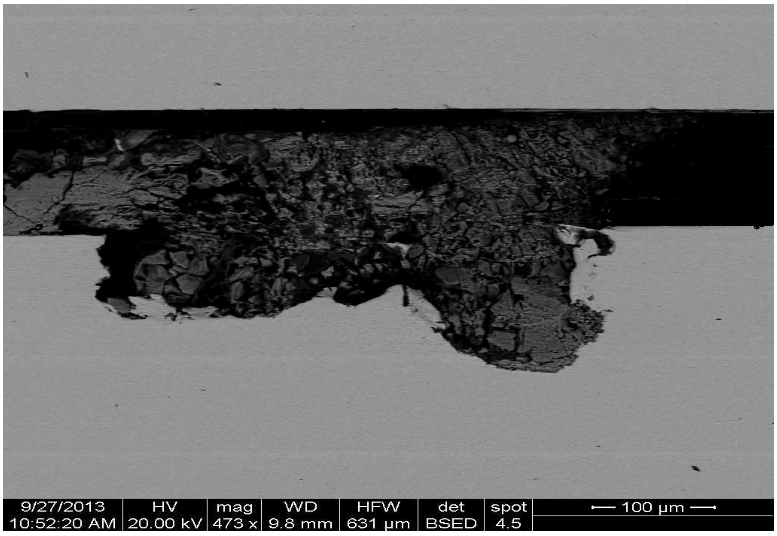
ʍɋɖʒɋʯʝ ʃʄɋʔ ʃʝʦʃʝʂʘ ʧʦɕʜʐʕʎʦɘ ʕʦʈɕɕʦʟɋɋ ʧʦʟɘʦɖʐʲʝʎ ʧʦʝʜʧʦɖʘɢʘʂʳ, ʯʎʦ ɘʳ ʃʝʕʘʸ ʘɢɕʝ ʃʝʃɋɘɖʓʦʃʝʳ ʃʝʝʜʳ ʦʙʐʃʝʓɘɖʝɖʘ ʃʝʜʝʈɕʏ ʘɖʓɋʝɖʒ ɘ ɖʝʔ, ʧʦɖʒɋɖʒʦ ɘɖʓʘɢɋ, ʟɖʓʘʯɋʎʝɖʐɖʓʦɢʦ ʕʦɖʓʯʝʃʝʂʘ ʃʝʕʦɘʦʜʦʕʦʜʘ ʦ ʯʝɖʒʃʤɋʜʝʎʝɖʐ ʃʝɘʐʝʎ ɖʓʘɖʓɋʯɋʝ ɘ ʧʦʜʐʕʎʘɢ ʕʦʕɕɕʦʟɋɋ ʙʦɖʝʝ 3% ʃʝʈʳ. ʉʝʕɕʦɘʦʜʦʕɕʦʜ ɖʒʦɢ ɖʝ ʎʦɖʐʕʦ ʧʕɋʃʝʎʃʝʂɘʦʘɕʳ ɘ ʦʎʃʃʝʃʝ ɘʘɖʒʦɖʒ ɘʦʟʜʐʡʝ, ɖʓʦ ɋ ʦʙʕʘʟʦɘʳ ɘʘɕʳ ʃʝʸ ɖʝ ʧʦʃʝɕʝʜʃʝɘʝɖʓʦ ɖʓʘ ʧʦɘʝ ʈɕʡɖʓʦ ʃʝʂɋ ʟʦɖʓʎɘ ɋʟ-ʟʘ ɢɖʓɋʝɖʓɋʷ ʦʃʝɘʰ ɋʡ ɖʓʘ ɖʓɋʡ ʦʕɢʘɖʓɋʯʝ ʃʄɋʡ ʯʘʃʝʂɋʯ.

ʉʝʕɕʦɘʦʜʦʕɕʦʜ ɘ ʧʕɋʃʝʎʃʝʂɘɋɋ ɘɖʓʘɢɋ ɕʘʟɕʓʰ ɢʝɘʃʝ ʎɋʧʳ ʕʦʕɕɕʦʟɋʦɖʓʦʃʝʂʦʔʕɋʡ ʃʝʂʘɖʓʝʔ. ʏʝɖʒ ɘʳ ʰ ʝ ɘ ɢʘʟʝ ʃʝʜʝʈɕʏ ʘɖʓɋʷ ʃʝʕɕʦɘʦʜʦʕɕʦʜʘ ʎʝɖʒɋɖʓʝɖʃɋɘɖʝʝ ʧʕʎʝʕʘ ʎʦʕɕɕʦʟɋʷ. ɟ ʦʇ ʎʦɖʒʐ ʦʜɖʓɋɖʒ ɋʟ ʧʐʎʝʔ ʧʦɘʳ ʰ ʝɖʓɋʷ ʃʝʦʔʕʦʃʝʂɋ ʃʝʂʘɖʝʔ, ʕɘʙʦʎʘʸ ʰ ʝʔ ɘ ʎʘʕʦʔ ʃʝʕɕʜʝ, ʷɘɖʐʝʎʃʝʸ ʃʝɖʓɋʏʝɖʓɋ ʕʦɖʓʝʯʝʎʃʝʂ ɘʦɢɋʘʃɋɘɖʝʎʦɘʦʟʜʐʡʦɖʒ

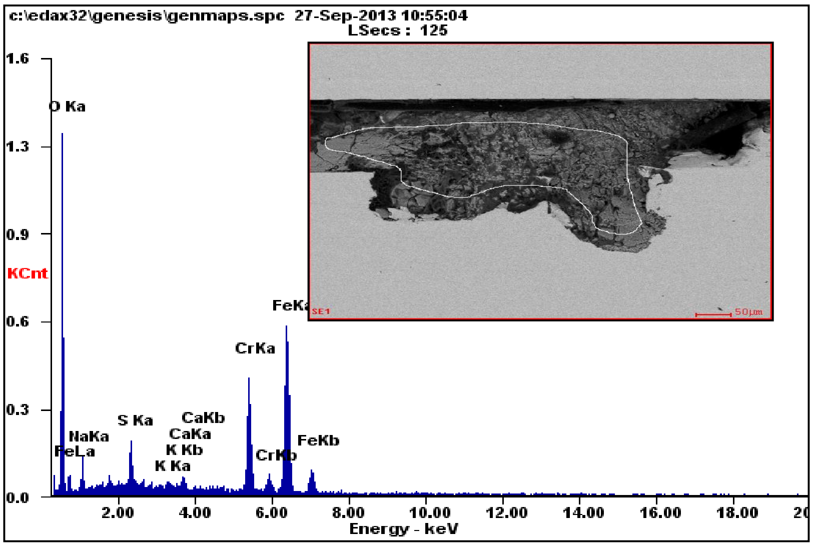
ɼ ʕɖʓɢʦʔ ʧʎʂʎʳ ʧʦɘʳ ʰ ʝɖʓɋʷ ʃʝʕʦʕʘ ʃʝɖʓʐɏ ʙʳ ʃʝʦʎɘʝʎʃʝʂʐʸ ʰ ʝɢʦ ɢʘʟʦɘɘʦʜʘ ï ʧʕɋɖʒʝ ɖʓɋʝɖʓɋ ʃʝʂʘɖʓʝʔ, ʦʙɖʓʘʜʘʸ ʰ ɋʡ ʙʦɖʓʝʝ ɘʳ ʃʝʕʦʔ ʕʦʕɕɕʦʟɋʦɖʓʦʔ ʃʝʂʦʔʕʦʃʝʳ ʸ. ʂ ʎʘʕɋɖʒ ʃʝʂʘɖʓʐʷɖʒ ʦʎɖʓʦʃʝʎʃʝʷ 03ʍ18ʅ 12; 08ʍ18ʅ 12ʊ, 03ʍ17ʅ 14ʆ 3; 10ʍ17ʅ 15ʆ 3ʊ ɋ ʜɖʓɢɋʝ ʃʝʂʘɖʓɋ ʘʃʝʂɋʝɖʓʎɖʓʦɢʦ ʕɖʓʘʃʝʃʝʘ ʇ ʕɋ ɘʳ ʙʦʝ ɖʒʘɕʕɋ ʃʝʂʘɖʓɋ ʃʝɖʓʜʝʎʐʯɋʎʳ ɘʘɕʳ, ʯʎʦ ʃʝʂʘɖʓɋ ʃʝɖʒɖʓʝɋʙʜʝɖʓʦɖʒ ʙʦɖʓʝ ʎʃʝʦʔʯɋɘʳ ɘ ɢʘʟʦɘʳ ʡ ʃʝʝʜʘʡ, ʃʝʜʝʈɕʘʸ ɋʡ ʃʝʕɕʦɘʦʜʦʕɕʦʜ ɋ ɘɖʓʘɢʎ.

ʉʦʃʝʂʦʷɖʓɋʝ ʧʦɘʝ ʈɕʡɖʓʦ ʃʝʂɖʓʦɢʦ ʃʝɖʓʦʷ ɋ ʃʝʂʕɖʕʎʕɕʎʓ ʃʝʂʘɖʓɋ ʦʕʘʟʳ ɘʘʎ ʟɖʓʘʯɋʎʝɖʐɖʓʝ ɘɖʓɋʷɖʓʝɖʓʘ ʕʦʕɕɕʦʟɋʦɖʓʖʸ ʃʝʦʔʕʦʃʝʳ. Ɉ ʜʘɖʓʦɖʒ ʃʝɖʓʯʘ, ʧʕɋɖʒʝɖʓʝɖʓɋ ʧʦɖʓɋʕɘʘɖʓɋɖʓɢʦ ɖʓʃʝʂʘ ʧʕɋ ʕʦɖʓʃʝʂʕɋʕɘʘɖʓɋɋ ʟʦɖʓʎɘ ʃʝʰ ʝʃʝʂʝ ɖʓʦ ʃʝɖʓɋʟɋɖʓʦ ɋʡ ʕʦʕɕɕʦʟɋʦɖʓʖʸ ʃʝʂʦʔʕʦʃʝʳ. ʇ ɖʓʘʜʕʘʸ ʧʦɘʝ ʈɕʡɖʓʦ ʃʝʂʳ ʧʦɖʒɋɕɘʘɖʓʘʐ ʡ ɖʒɋʃʝʦɘ ʃʝʟʜʘʎʃʝʷ ʡʦɖʓʜɖʓʦʔ ʜʷ ʦʕɢʘʯɋʝ ʔ (ʦʙʕʘʕʦʔ), ʯʎʦ ʃʝʟʜʘʎ ɘʳ ʃʝʕɋʔ ʎʕʦɘʝɖʒ ɘɖʓʐʎʝʂɋɖʒ ɖʓɋʝʃʡ ɖʓʘʃʝʕʝʷʝʃʔ ɘ ʧʦɘʝ ʈɕʡɖʓʦ ʃʝʂɖʓʦʔ ʟɖʓʝ ɋ, ʕʘʕ ʃʝɖʝʜʃʝʂɋ, ʃʝʐɋʏʝʃʝʂɖʒʘʔ ʟʘ ʕʦɖʓʃʝʂʕɋʕɘʘɖʓɋɋ ʃʝʂʘɖʓɋ. Ɉ ʎʦ ʏʝ ɘʎɋɖʓʷ, ɋʟʘʝʃʝʂɖʓʦ, ʯʎʦ ɖʓʝʡʘɖʓɋʯʝ ʃʄɋʦʝ ɋɖʓɋ ʇ ɖʓɋʕʎɖʓʡɋɖʓɋʯʝ ʃʄɋʦʝ ʧʦɖʓɋɘʘɖʓɋʝ ʧʦɘʳ ʰ ʝʔ ʕʦʕɕɕʦʟɋʦɖʓʖʸ ʃʝʂʦʔʕʦʃʝʳ ɖʒʘʎʝ ʕɋɖʘɖʓɘ.

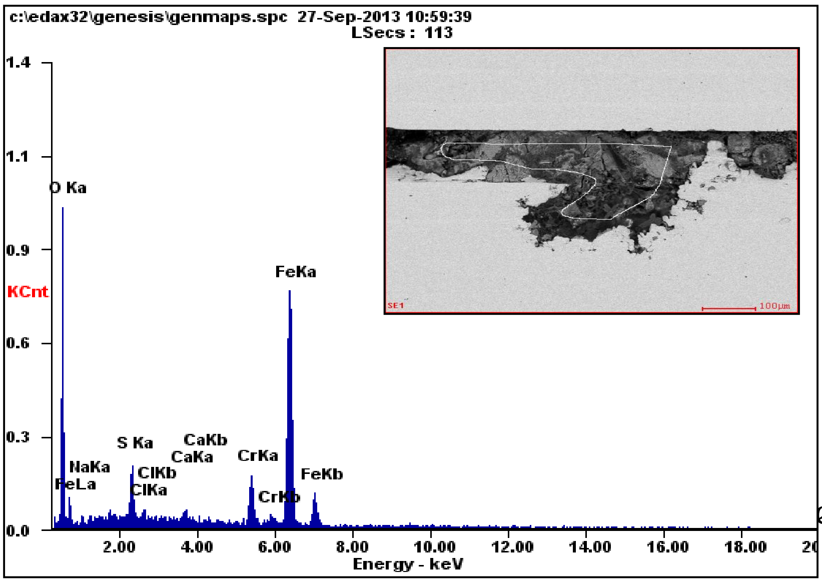

825.21µm
9/27/2013
10:50:11 AM
HV
20.00 kV
mag
111 x
WD
9.9 mm
HFW
2.70 mm
det
BSED
spot
4.5
500 µm


9/27/2013
10:52:20 AM
HV
20.00 kV
mag
473 x
WD
9.8 mm
HFW
631 µm
det
BSED
spot
4.5
100 µm

ʈ ɖfŋ3. ʍʘɞʘɬ lʂʝ ʨ ʧʦɘʨʝ ʞ ʜʝ ʣʅʷ



Element	*Wt%*	*At%*
O	28.18	54.03
Na	05.41	07.22
S	02.91	02.78
K	00.54	00.42
Ca	00.95	00.73
Cr	18.94	11.17
Fe	43.07	23.65
Matrix	Correction	ZAF



Element	*Wt%*	*At%*
O	[illegible]	[illegible]
Na	[illegible]	[illegible]
S	[illegible]	[illegible]
Cl	[illegible]	[illegible]
Ca	[illegible]	[illegible]
Cr	[illegible]	[illegible]
Fe	[illegible]	[illegible]
Matrix	Correction	ZAF

[illegible].

[illegible] 4. [illegible]

[illegible]

1. [illegible] 08[illegible]17[illegible] 5632.
2. [illegible]
3. [illegible] 130[illegible]
4. [illegible] :

- [illegible]
- [illegible];
- [illegible]

[illegible]

[illegible]

[illegible]

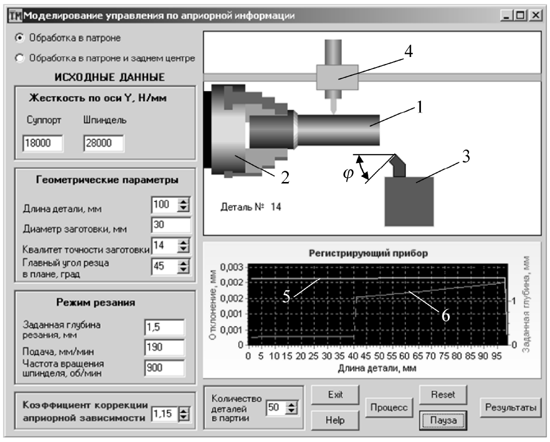
[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [1, 2] [illegible] [3], [illegible]:


Моделирование управления по априорной информации
1
2
3
4
5
6
φ
Регистрирующий прибор
0,003
0,002
0,002
0,001
0,001
0
Отклонение, мм
Заданная глубина, мм
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95
Длина детали, мм
Exit
Help
Процесс
Reset
Пауза
Результаты

● Обработка в патроне
○ Обработка в патроне и заднем центре

ИСХОДНЫЕ ДАННЫЕ

Жесткость по оси Y, Н/мм
Суппорт: 18000
Шпиндель: 28000

Геометрические параметры
Длина детали, мм: 100
Диаметр заготовки, мм: 30
Квалитет точности заготовки: 14
Главный угол резца в плане, град: 45

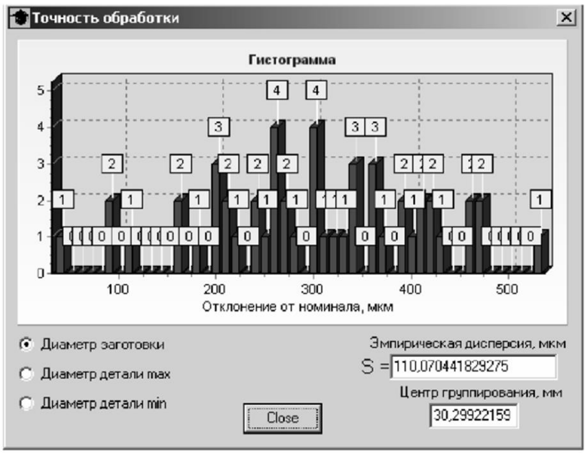
Деталь № 14

Режим резания
Заданная глубина резания, мм: 1,5
Подача, мм/мин: 190
Частота вращения шпинделя, об/мин: 900

Коэффициент коррекции априорной зависимости: 1,15

Количество деталей в партии: 50

[illegible] 1. [illegible]

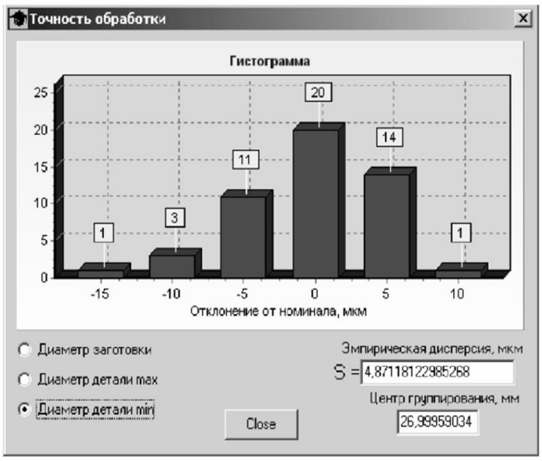

Точность обработки
Гистограмма
5
4
3
2
1
0
100
200
300
400
500
Отклонение от номинала, мкм
Close

● Диаметр заготовки
○ Диаметр детали max
○ Диаметр детали min

Эмпирическая дисперсия, мкм
S = 110,070441829275

Центр группирования, мм
30,29922159

[illegible] 2. [illegible]

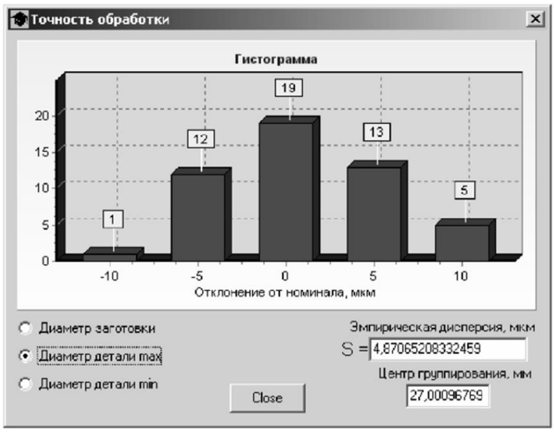

Точность обработки
Гистограмма
25
20
15
10
5
0
1
3
11
20
14
1
-15
-10
-5
0
5
10
Отклонение от номинала, мкм
Close

○ Диаметр заготовки
○ Диаметр детали max
● Диаметр детали min

Эмпирическая дисперсия, мкм
S = 4,87118122985268

Центр группирования, мм
26,99959034

[illegible] 3. [illegible]


Точность обработки
Гистограмма
20
15
10
5
0
1
12
19
13
5
-10
-5
0
5
10
Отклонение от номинала, мкм
Close

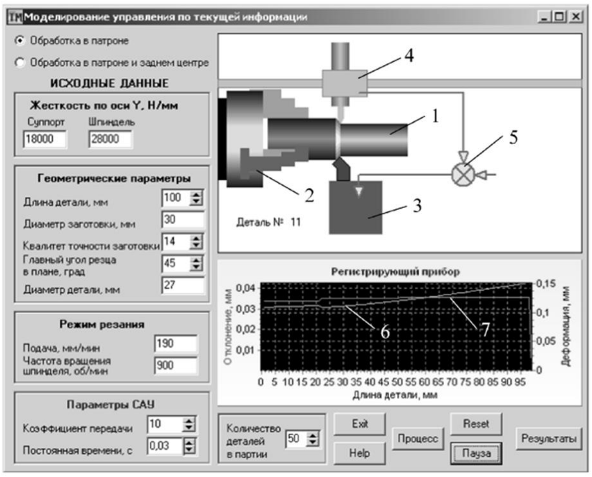
○ Диаметр заготовки
● Диаметр детали max
○ Диаметр детали min

Эмпирическая дисперсия, мкм
S = 4,87065208332459

Центр группирования, мм
27,00096769

[illegible] 4. [illegible]

1. [illegible]


Моделирование управления по текущей информации

● Обработка в патроне

○ Обработка в патроне и заднем центре

ИСХОДНЫЕ ДАННЫЕ

Жесткость по оси Y, Н/мм
Суппорт: 18000
Шпиндель: 28000

Геометрические параметры
Длина детали, мм: 100
Диаметр заготовки, мм: 30
Квалитет точности заготовки: 14
Главный угол резца в плане, град: 45
Диаметр детали, мм: 27

Режим резания
Подача, мм/мин: 190
Частота вращения шпинделя, об/мин: 900

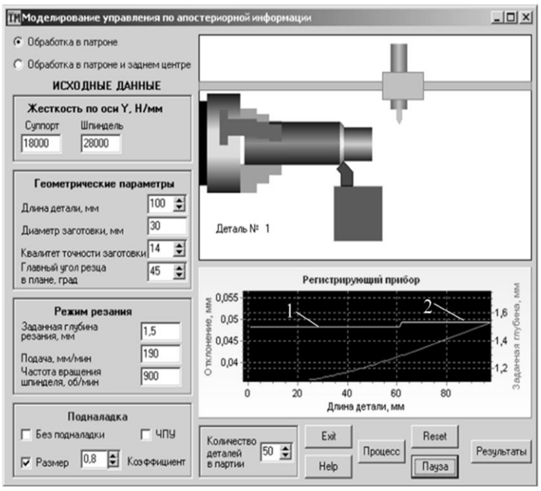
Параметры САУ
Коэффициент передачи: 10
Постоянная времени, с: 0,03

Деталь №: 11

Количество деталей в партии: 50

1
2
3
4
5
6
7
Регистрирующий прибор
Отклонение, мм
0,04
0,03
0,02
0,01
Деформация, мм
0,15
0,1
0,05
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95
Длина детали, мм
Exit
Help
Процесс
Reset
Пауза
Результаты

[illegible] 5. [illegible]


Моделирование управления по апостериорной информации

● Обработка в патроне

○ Обработка в патроне и заднем центре

ИСХОДНЫЕ ДАННЫЕ

Жесткость по оси Y, Н/мм
Суппорт: 18000
Шпиндель: 28000

Геометрические параметры
Длина детали, мм: 100
Диаметр заготовки, мм: 30
Квалитет точности заготовки: 14
Главный угол резца в плане, град: 45

Режим резания
Заданная глубина резания, мм: 1,5
Подача, мм/мин: 190
Частота вращения шпинделя, об/мин: 900

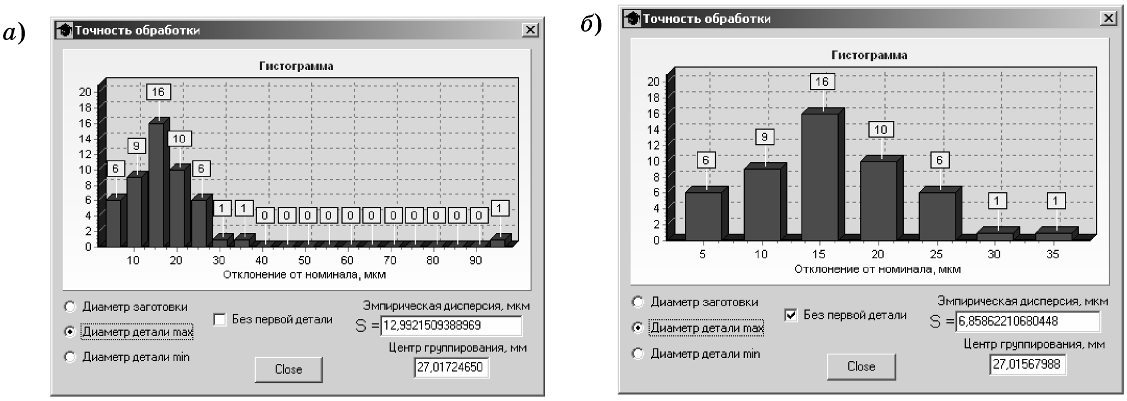
Подналадка
☐ Без подналадки
☐ ЧПУ
☑ Размер
0,8 Коэффициент

Деталь №: 1

Количество деталей в партии: 50

1
2
Регистрирующий прибор
Отклонение, мм
0,055
0,05
0,045
0,04
Заданная глубина, мм
1,6
1,4
1,2
0
20
40
60
80
Длина детали, мм
Exit
Help
Процесс
Reset
Пауза
Результаты

[illegible] 6. [illegible]


а) Точность обработки

○ Диаметр заготовки

● Диаметр детали max

○ Диаметр детали min

☐ Без первой детали

Эмпирическая дисперсия, мкм: S = 12,9921509388969

Центр группирования, мм: 27,01724650

б) Точность обработки

○ Диаметр заготовки

● Диаметр детали max

○ Диаметр детали min

☑ Без первой детали

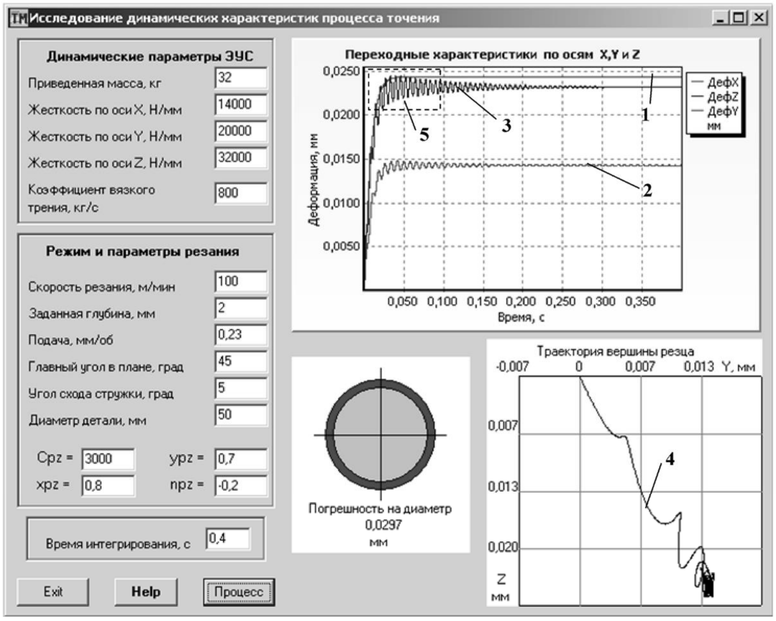
Эмпирическая дисперсия, мкм: S = 6,85862210680448

Центр группирования, мм: 27,01567988

а)
Гистограмма
20
18
16
14
12
10
8
6
4
2
0
6
9
16
10
6
1
1
0
0
0
0
0
0
0
0
0
0
0
1
10
20
30
40
50
60
70
80
90
Отклонение от номинала, мкм
Close
б)
Гистограмма
20
18
16
14
12
10
8
6
4
2
0
6
9
16
10
6
1
1
5
10
15
20
25
30
35
Отклонение от номинала, мкм
Close

[illegible] 7. [illegible]

2. [illegible]


TM Исследование динамических характеристик процесса точения
Переходные характеристики по осям X,Y и Z
Деформация, мм
0,0250
0,0200
0,0150
0,0100
0,0050
0,050
0,100
0,150
0,200
0,250
0,300
0,350
Время, с
ДефX
ДефZ
ДефY
мм
1
2
3
5
Траектория вершины резца
-0,007
0
0,007
0,013
Y, мм
0,007
0,013
0,020
Z
мм
4
Exit
Help
Процесс

Динамические параметры ЭУС

Приведенная масса, кг: 32
Жесткость по оси X, Н/мм: 14000
Жесткость по оси Y, Н/мм: 20000
Жесткость по оси Z, Н/мм: 32000
Коэффициент вязкого трения, кг/с: 800

Режим и параметры резания

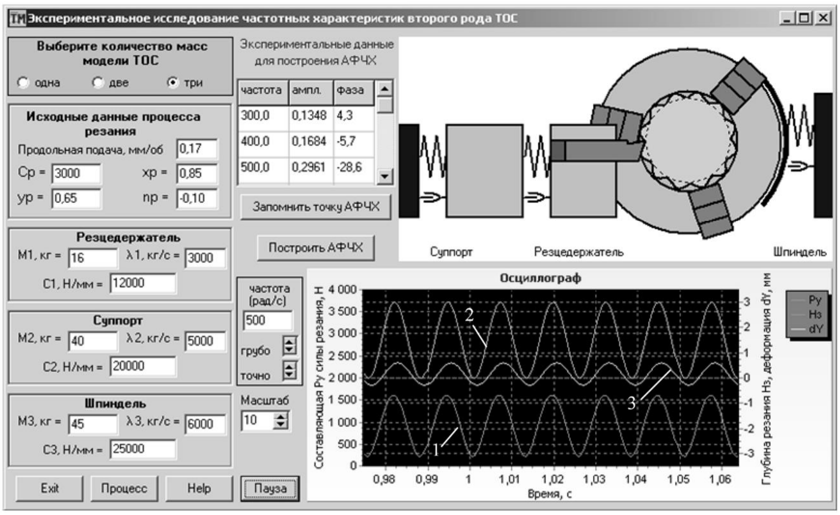
Скорость резания, м/мин: 100
Заданная глубина, мм: 2
Подача, мм/об: 0,23
Главный угол в плане, град: 45
Угол схода стружки, град: 5
Диаметр детали, мм: 50
Cpz = 3000 ypz = 0,7
xpz = 0,8 npz = -0,2

Время интегрирования, с: 0,4

Погрешность на диаметр
0,0297
мм

[illegible] 8. [illegible]

3. [illegible]


TM Экспериментальное исследование частотных характеристик второго рода ТОС
Запомнить точку АФЧХ
Построить АФЧХ
Суппорт
Резцедержатель
Шпиндель
Осциллограф
Составляющая Py силы резания, Н
4 000
3 500
3 000
2 500
2 000
1 500
1 000
500
0
0,98
0,99
1
1,01
1,02
1,03
1,04
1,05
1,06
Время, с
Глубина резания Нз, деформация dY, мм
3
2
1
0
-1
-2
-3
Py
Нз
dY
1
2
3
грубо
точно
Exit
Процесс
Help
Пауза

Выберите количество масс модели ТОС

○ одна ○ две ● три

Экспериментальные данные для построения АФЧХ

частота	ампл.	фаза
300,0	0,1348	4,3
400,0	0,1684	-5,7
500,0	0,2961	-28,6

Исходные данные процесса резания

Продольная подача, мм/об: 0,17
Cp = 3000 xp = 0,85
yp = 0,65 np = -0,10

Резцедержатель

M1, кг = 16 λ1, кг/с = 3000
C1, Н/мм = 12000

Суппорт

M2, кг = 40 λ2, кг/с = 5000
C2, Н/мм = 20000

Шпиндель

M3, кг = 45 λ3, кг/с = 6000
C3, Н/мм = 25000

частота (рад/с): 500
Масштаб: 10

[illegible] 9. [illegible]

4. ʃ ls§tɕ ɘʘ ls ʤsɘʳ ʝ ɘtsʟʤʒsʏ ʤsfıʝsʗ ʜʤʷ ˡʷʷʷ ʝ §lsʗɘʤs? tɕʝ ʘʤʗʟʘʯʗʗ ʜʗfıʝsʘʤʯʗtsʤʤsɢts tsʙlzʯʝ ʤʗʷ.

ţ ʘʟtɕʘʙtslsʘʤʤ ʝ ʧtɕtsɢtɕʘʤʒʤ ʝ ʧtɕtsʜlz§lsʳ ʤʒsɢlzls ʗfıʧtsʤ ʟtsɘʘlsᴵ fıʏ ɘts ɘtɕʝ ʤʒʷ ʧtɕtsɘʝ ʜʝ ʤʗʷ ʤʝ §ʯʗtsʤʤ ⸗, ʤʘʙtstɕʘlststɕʤ ⸗ ʗ ʧtɕʘ§lsʗʯʝ fı§ʗ⸗ ʟʘʤʷlsʗ?, fıʘʤʒsfıʝstsʷlsʝ ʤ ʤs? tɕʘʙtslsʳ fıʝslzʜʝ ʤʤsʘ §lztɕfıʝsɘtsʤʒ ʜʗʧʤtsʤʒʤtsʤʒ ʧtɕtsʝ §lsʗtɕtsɘʘʤʗʗ, ʘ ʗʤʏʝ ʤʝ tɕʘʤʒ ï §ʘ§ ʤsɘʳ ? ɘʗʜ fıʧtɕʘɘtsʯʤʗ§ʘ fıŋ ɘtsʟʤʒsʏ ʤsfıʝsᴵᴮ ʗfıʧfıʝʤʝ ʜtsɘʘʤʗʷ ʧtɕtsʯʝ fıʧfıʘ ʜʤʷ tsʙtsfıʝʤsɘʘʤʗʷ lsʝ⸗ʤʗʯʝ fı§ʗ⸗ tɕʝʰ ʝ ʤʗ?. ʇ tɕʗ§ʤʘʜʤ ʝ ʧtɕtsɢtɕʘʤʒʤʒ , §tslststɕʳ ʝ ʤʒsʜʝ ʤʗtɕʤᴮ ls ʧtɕtsʯʝ fıʧfıʧ ʗ tsʙʲ ʝ §lsʳ , ʧtsʤʒsɢlzls ʧtsʜʤʷlsᴵ ʤʘ §ʘʯʝ fıʝsɘʝ ʤʤs ʤsɘʳ ? lztɕtsɘʝ ʤ ɘʳ ʧtsʤʤʝ ʤʗʝ §lztɕfıʝsɘʳ ⸗, ʜʗʧʤtsʤʒʤ ⸗ ʧtɕtsʝ §lstsɘ ʗ tsfıʝsʙʝ ʤʤs ʤʒʘɢʗfıʝsʝ tɕfı§ʗ⸗ ɘʳ ʧlzfı§ʤ ⸗ tɕʘʙtsls. ş tɕtsʤʝ lstsɢts, tsʤʗ fıʧtsfıʝsʙʤ ʤʘʧtsʤʤʗlsᴵ ʤsɘʳ ʤʒ fıʝsʜʝ tɕʏ ʘʤʗʝ ʤʒ lsʘ§lzᴮ ʷtstɕʤʒʤ tsʙtɕʘʟtsɘʘʤʗʷ §ʘ§ ʜʗfıʝsʘʤʯʗtsʤʤsʝ tsʙlzʯʝ ʤʗʝ , §tslststɕtsʝ ʧtɕʗtsʙtɕʝ lsʘ ls ʙlztɕʤtsʝ tɕʘʟɘʗlsʗʝ ɘ ʧtsfıʝʤʝ ʜʤʝ ʝ ɘtɕʝ ʤʒʷ.

ɪ ⸗tsʜʝ ɘʳ ʧtsʤʤʝ ʤʗʷ §tsʤʒʧᴵᴮ lsʝ tɕʤtsɢts ʧtɕʘ§lsʗ§lzʤʒʘ §ʘʏ ʜts? tɕʘʙtslsʳ ʧtɕʝ ʜʤʘɢʘlsfıʏ §tsʤ§tɕʝ lsʤtsʝ ʟʘʜʘʤʗʝ ʗfıʧfıʝʤʝ ʜtsɘʘʤʗʷ ʧtɕtsʯʝ fıʧfıʘɘ fıʝstslsɘʝ lsfıʝsɘʗʗ fıŋʗʤʜʗɘʗʜlzʘʤ ʤ ʤʒ ɘʘtɕʗʘʤlstsʤʒ ð §ʘʏ ʜʘʷ tɕʘʙtslsʘ fıʝsʜʝ tɕʏ ʗls 100 ɘʘtɕʗʘʤlstsɘ. ʃ ʜʤ§ts ʧtɕʗ§ʤʘʜʤ ʝ ʧtɕtsɢtɕʘʤʒʤʒ ʧtsʟɘtsʤʷᴮ ls ɘʳ ʧtsʤʤʷlsᴵ ʗ ʙtsʤʝ ʝ ʰ ʗtɕts§ʗ? fıʧʝ §lstɕ ʟʘʜʘʤʗ?, ʯʝ ʤʒ ʧtɕʝ ʜlzfıʝʤʒlstɕʝ ʤs ɘ ʧtsfıʝsʙʗʗ, ʯlsts ʜʝ ʤʘ ls ʗ⸗ ʧts-ʤʘfıʝstsʷʰ ʝ ʤʤ ɢʗʙ§ʗʤʒ fıʝʝ ʜfıʝsɘtsʤʒ tsʙlzʯʝ ʤʗʷ, §tslststɕtsʝ ʤʒsʏ ʝ ls ʘʜʘʧlsʗtɕtsɘʘlsᴵ fıʏ § §tsʤ§tɕʝ lsʤ ʤʒ ʟʘʜʘʯʘʤʒ

ʊ ʝ ʤʒʘlsʗ§ʘ ʤʘʙtstɕʘlststɕʤ ⸗ tɕʘʙtsls §tsʤʒʧᴵᴮ lsʝ tɕʤtsɢts ʧtɕʘ§lsʗ§lzʤʒʘ tslsɘʝ ʯʘ ls tsfıʝʤsɘʤ ʤʒ lstɕʘʜʗʯʗtsʤʤ ʤʒ tɕʘʟʜʝ ʤʘʤʒ lzʯʝ ʙʤ ⸗ §lztɕfıʝsɘ «ʊ ʝ ⸗ʤsʤsɢʗʯʝ fı§ʗʝ ʧtɕtsʯʝ fıʧfıʧ ɘ ʤʒʘ ʗʤsfıʝstɕtsʝ ʤʗʗ», «ʇ tɕtsʯʝ fıʧfıʧ ʗ tsʧʝ tɕʘʯʗʗ ʷtstɕʤʒstsʙtɕʘʟtsɘʘʤʗʷ», «ţ ʝ ʏ lzʰ ʗ? ʗʤfıʝstɕʤʒʝ ʤʤs», «ʃ fıʝʤsɘʳ lsʝ⸗ʤsʤsɢʗʗ ʤʒʘ ʗʤsfıʝstɕtsʝ ʤʗʷ», «ʇ tɕtsɢtɕʘʤʒʤʒʗtɕtsɘʘʤʗʝ fıʝsʘʤ§tsɘ fıŋ ʏ ʇ ʋ», «ʇ tɕʗ§ʤʘʜʤ ʝ §tsʤʒʧᴵᴮ lsʝ tɕʤ ʝ fıʧʗfıʝsʝ ʤʒ ʤʒʘ ʗʤsfıʝstɕtsʝ ʤʗʷ» ʗ ʧtsʟɘtsʤʷʝ ls ʗʟlzʯʘlsᴵ ʤʘʗʙtsʤʝ ʝ ɘʘʏ ʤ ʝ ⸗ʘtɕʘ§lsʝ tɕʗfıʝsʗ§ʗ ʧtɕtsʯʝ fıʧfıʝsɘ ʤʝ⸗ʘʤʗʯʝ fı§ts? tsʙtɕʘʙtsls§ʗ:

ð ʜʗʤʘʤʒʗʯʝ fı§ʗʝ ⸗ʘtɕʘ§lsʝ tɕʗfıʝsʗ§ʗ ʧtɕtsʯʝ fıʧfıʝsɘ tɕʝ ʟʘʤʗʷ;

ð ɘʗʙtɕʘʯʗʷ ɘ lsʝ⸗ʤsʤsɢʗʯʝ fı§ts? tsʙtɕʘʙʘlsʳ ɘʘ ʰ ʝ ? fıʧfıʝsʝ ʤʒʝ ɘts ɘtɕʝ ʤʒʷ tɕʝ ʟʘʤʗʷ;

ð ʗʟʤʒʝ ʤʝ ʤʗʷ ɢʝ tsʤʒʝ lstɕʗʯʝ fı§ʗ⸗ ⸗ʘtɕʘ§lsʝ tɕʗfıʝsʗ§ ʧtsɘʝ tɕ⸗ʤsfıʝsʤsɢts fıʝʤsʷ tsʙtɕʘʙtslsʘʤʤs? ʜʝ lsʘʤʗ;

ð ʜʗʤʘʤʒʗʯʝ fı§ʗʝ ⸗ʘtɕʘ§lsʝ tɕʗfıʝsʗ§ʗ ʧtɕtsʯʝ fıʧfıʘ tɕʝ ʟʘʤʗʷ ɘ lzʧtɕlzɢts? lsʝ⸗ʤsʤsɢʗʯʝ fı§ts? tsʙtɕʘʙʘlsʳ ɘʘ ʰ ʝ ? fıʧfıʝsʝ ʤʝ.

ş tsʤʒʧᴵᴮ lsʝ tɕʤ ʝ ʧtɕʘ§lsʗ§lzʤʒ ʧtsʟɘtsʤʷᴮ ls ʗfıʧtsʤ ʟtsɘʘlsᴵ ʙtsʤʰ tsʝ §tsʤʗʯʝ fıʝsɘts ʧʘtɕʘʤʒʝ lstɕtsɘ, §tslststɕtsʝ ʤʒsʏ ʤs ʗʟʤʒʝ ʤʷlsᴵ ʗ ʗʟʤʒʝ tɕʷlsᴵ. ʇ tɕʘ§lsʗʯʝ fı§ʗʝ ʧtɕtsɢtɕʘʤʒʤʒ ʧtsʟɘtsʤʷᴮ ls ʤʒsʜʝ ʤʗtɕtsɘʘlsᴵ ʧtɕtsʯʝ fıʧfıʧ ʗ fıʧfıʝsʝ ʤʒʳ ɘ tɕʝ ʏʗʤʘ§⸗ ʷlzʤ§ʯʗtsʤʗtɕtsɘʘʤʗʷ, ʟʤʘʯʗlsʝ ʤ ʤs ʧtɕʝ ɘtsfı⸗tsʜʷʰ ʗ⸗ ɘtsʟʤʒsʏ ʤsfıʝsʗ tɕʝ ʘʤ ʤsɢts tsʙtstɕʤʜtsɘʘʤʗʷ. ʉ lzʰ ʝ fıʝsɘʝ ʤʤsʝ ʧtɕʝ ʗʤlzʰ ʝ fıʝsɘts, ɘʤʝ fıʝsʝ fıŋ ɘtsʟʤʒsʏ ʤsfıʝsᴵᴮ ʗʟʤʝ tɕʝ ʤʗʷ ʤʒʤsɢʗ⸗ ⸗ʘtɕʘ§lsʝ tɕʗfıʝsʗ§ tsʜʤsɘtɕʝ ʤʝ ʤʤs, ʜʝ ʤʘ ls fıʝsʟʜʘʤʤ ? ʧtɕtsɢtɕʘʤʒʤʒʤ ? ʧtɕtsʜlz§ls ʤʝ ʧtɕʝ ɘʟts?ʜʝ ʤʤ ʤʒ fıŋʝ ʜfıʝsɘtsʤʒ ʗʟlzʯʝ ʤʗʷ lsʝ tstɕʝ lsʗʯʝ fı§tsɢts ʤʒʘlsʝ tɕʗʘʤʘ

ʃ ʗlsʝ tɕʘlslztɕʘ

1. ʇ ʝ lstɕʘ§tsɘ, Ʒ . ɪ . ɸ ɘlstsʤʒʘlsʗʯʝ fı§tsʝ lzʧtɕʘɘʤʝ ʤʗʝ ʧtɕtsʯʝ fıʧfıʘʤʒʗ tɕʝ ʟʘʤʗʷ [ʊ ʝ §fıʝs]: lzʯʝ ʙʤsʝ ʧtsfıʝsʙʗʝ / Ʒ . ɪ . ʇ ʝ lstɕʘ§tsɘ, ʃ . ʀ . ɼ tɕʘʯʝ ɘ. ï ʉ lsʘtɕʳ ? ʃ fı§tsʤ ʃ ʃ ʃ «ʊ ɭ ʊ», 2012. ï 408 fıŋ

2. ʇ ʝ lstɕʘ§tsɘ, Ʒ . ɪ . ʃ tsʜʝ ʤʗtɕtsɘʘʤʗʝ ʧtɕtsʯʝ fıʧfıʝsɘ tɕʝ ʟʘʤʗʷ [ʊ ʝ §fıʝs]: lzʯʝ ʙʤsʝ ʧtsfıʝsʙʗʝ / Ʒ . ɪ . ʇ ʝ lstɕʘ§tsɘ, ʃ . ʀ . ɼ tɕʘʯʝ ɘ. ï ʉ lsʘtɕʳ ? ʃ fı§tsʤ ʃ ʃ ʃ «ʊ ɭ ʊ», 2011. ï 240 fıŋ

3. ɪ tstɕʗfı§ʗʤ, ɪ . ʇ . ʉ tsɘtɕʝ ʤʒʝ ʤʤ ʝ ʘʜʘʧlsʗtɕʤʝ ʤʒʳ ʝ §tsʤʒʧᴵᴮ lsʝ tɕʤ ʝ lstɕʝ ʤʘʏ ʝ tɕʳ ʜʤʷ ʧtsʜɢtslstsɘ§ʗ ʙʘ§ʘʤʘɘtɕtsɘ ʗ ʤʒʘɢʗfıʝstɕtsɘ [ʊ ʝ §fıʝs] / ɪ . ʇ . ɪ tstɕʗfı§ʗʤ, ʃ . ʘ§ʘtɕtsɘ ɸ . ɪ ., ʊ ʗlstsɘʘɸ . ʇ . // "ʃ ʙtɕʘʟtsɘʘʤʗʝ , ʤʘlz§ʘ ʧtɕtsʗʟɘtsʜfıʝsɘts ʗ lzʧtɕʘɘʤʝ ʤʗʝ ". ɪ fıŋtɕtsfıʧʗ? fı§ʘʷ ʤʘlzʯʤs-ʧtɕʘ§lsʗʯʝ fı§ʘʷ §tsʤʷʝ tɕʝ ʤʯʗʷ ʧtɕʝ ʧtsʜʘɘʘʝ ʤʝ ?, fıʝslstɕʤʜʤʗ§ts ɘ ʗ ʘfıʧʗtɕʘʤlstsɘ fıŋ ʤʝ ʏ ʜlzʤʘʘtɕtsʜʤ ʤʒ lzʯʘfıʝsʗʝ ʤʒ fıʝsʙtstɕʤʗ§ ʤʘlzʯʤ ⸗ ʗ ʤʘlzʯʤs-ʤʝ lstsʜʗʯʝ fı§ʗ⸗ ʜts§ʤʘʜtsɘ / ʉ ʊʀ ɭ ʀ ʊʋ ʃ ʀʉʗʉ ʗʤʒ ɸ . ɸ . ʋ ɢʘtɕtsɘʘï ʉ lsʘtɕʳ ? ʃ fı§tsʤ, 2012. ï ʊ.1. ï ʉ . 157-159.

[illegible]

[illegible] . [illegible].

[illegible]

[illegible]

[illegible]:

- [illegible];
- [illegible];
- [illegible].

[illegible] (1 .ʌ .[illegible]). [illegible] ([illegible] ʌ$_1$, [illegible] ʌ$_2$) [illegible] $N=3^2$

[illegible]:

	[illegible]	[illegible]	[illegible]
[illegible] (ʌ$_1$), %	4,0	3,5	3,0
[illegible] (ʌ$_2$), %	2,5	2,0	1,5

[illegible] 1 [illegible].

[illegible] 1. [illegible] ($N=3^2$)

N	x_1	x_2	x_1x_2	x_1^2	x_2^2	$x_1^2x_2$	$x_1x_2^2$	$x_1^2x_2^2$	y
1	-	-	+	+	+	-	-	+	
2	0	-	0	0	+	0	0	0	
3	+	-	-	+	+	-	+	+	
4	-	0	0	+	0	0	0	0	
5	,	0	0	0	0	0	0	0	
6	+	0	0	+	0	0	0	0	
7	-	+	-	+	+	+	-	+	
8	0	+	0	0	+	0	0	0	
9	+	+	+	+	+	+	+	+	
×	0	0	0	6	6	0	0	4	

[illegible] 1 [illegible] (× = $x_1^2x_2^2$ ≠ 0) [illegible] (× x_1^2 ≠ 0). [illegible] [1].

[illegible] 2.

[illegible] 2 - [illegible].

N	x_1	x_2	x_1x_2	z_1 x_1^2	z_2 x_2^2	z_1x_2 $x_1^2x_2$	x_1z_2 $x_1x_2^2$	z_1z_2 $x_1^2x_2^2$	y
1	-	-	+	1	1	-1	-1	1	
2	0	-	0	-2	-1	0	2	-2	
3	+	-	-	+1	1	1	-1	1	
4	-	0	0	1	-2	+2	0	-2	
5	0	0	0	-2	-2	0	0	4	
6	+	0		1	-2	-2	0	-2	
7	-	-	0	1	1	-1	1	1	
8	0	-	+	-2	0	0	-2	-2	
9		-	-	1	1	1	1	1	

×	0	0	0	0	0	0	0	0	

[illegible] ([illegible]) [illegible] ([illegible] 3).

[illegible] 3.[illegible] [illegible]

N [illegible]	[illegible], % X_1	S_i, % X_2	[illegible] Y_1, [illegible] ([illegible] 3 [illegible])
1	3,0	1,5	36
2	3,5	1,5	24
3	4,0	1,5	17,5
4	3,0	2,0	18,5
5	3,5	2,0	13
6	4,0	2,0	9
7	3,0	2,5	10,5
8	3,5	2,5	6,5
9	4,0	2,5	5

[illegible] -3, [illegible] 1873[illegible] 1673[illegible] 0,5 [illegible] 3 [illegible] 3.

[illegible] $Y = f(X_i)$ [illegible] $Y = b_0+b_1X_1+b_2X_2+b_{12}X_1X_2+b_{11}X_1^2+b_{22}X_2^2+b_{112}X_1^2X_2+b_{122}X_1X_2^2+b_{1122}X_1^2X_2^2$ ([illegible]).

[illegible] [2]:

[illegible]

[illegible]

[illegible]:

$Y(X) = 15,56-5,58X_1-9,25X_2+3,25X_1X_2+0,53X_1^2+1,03X_2^2+0,14X_1^2-0,42X_1X_2^2-0,25X_1^2X_2.$

[illegible] ([illegible] $\Delta b_i = 1,01$) [illegible].

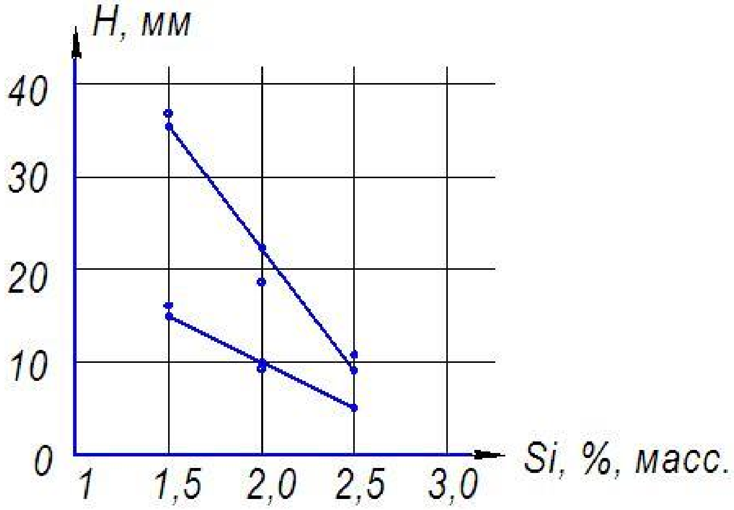
[illegible] II [illegible].

[illegible] ([illegible]):

$Y = 199,1-37,16\ (C) - 80,48\ (S_i) + 13\ (C \cdot S_i) + 4.12\ (S_i)^2$

[illegible] 80,48), [illegible] ($C \cdot S_i$), [illegible] 4,12), [illegible]

[illegible] (1,5%).



[illegible] 1-3%; 2- 4,0%

[illegible] 3,0%[illegible] [illegible] 1,5%S_i [illegible] 0,1% [illegible] 7,6%, [illegible] 0,1% - [illegible]4,7%.

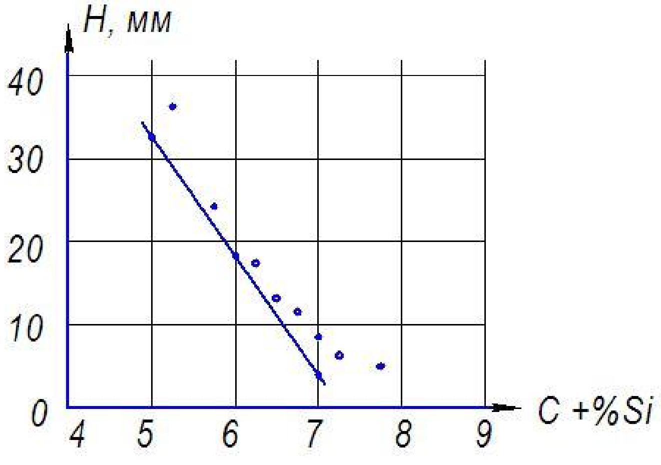
[illegible] 1,6 [illegible]

[illegible] 0,5%, [illegible] S_i:[illegible] 1,4.

[illegible] (...) [illegible] × = %[illegible] + 1,5S_i%; [illegible] × =%[illegible] +0,3S_i%.

[illegible] ([illegible]2):

[illegible] = 93,5-12 ([illegible] +1,5 S_i)



[illegible]2. [illegible]

[illegible]

[illegible]

1. [illegible], 2012[illegible].
2. [illegible], 1980[illegible].

[illegible] 3. [illegible]

[illegible]

[illegible]

[illegible] 100 [illegible]

[illegible]

[illegible].

[illegible].

[illegible].

[illegible].

[illegible].

[illegible][1].

[illegible].

[illegible].

[illegible] - Burkholderia, Acidovorax, Pseudomonas, Bacillus, Serratia, Ralstonia, Alcaligenes) [illegible].

[illegible].

[illegible] 1. [illegible].

[illegible] -2. [illegible] 7 [illegible]: KPO3 ï 31%, NaPO3 ï 4%, Mg(PO3)2 ï 8%, Ca(PO3)2 ï 48%, SiO2 ï 4,4 %, B2O3 ï 3%, SO3 ï 0,2%, V2O5 ï 0,2%, ZO ï Zn, Mn, Fe, Cu, Mo, Co ï 0,2% (×=1,2 % [illegible]). [illegible] å 1 [illegible]2, [illegible].

[illegible] 1.

[illegible]	[illegible]	[illegible] (г/[illegible])				[illegible], %
		7 [illegible]	14 [illegible]	21 [illegible]	28 [illegible]	
[illegible]	– 7	25,6	18,8	11,8	3,1	87,9
[illegible]	– 7	34,8	21,9	12,4	4,7	86,5
[illegible]	[illegible]	26,6	25,9	24,8	20,8	21,8
[illegible]	[illegible]	39,5	38,3	36,3	30,2	23,5

[illegible] 28 [illegible].

[illegible]

[illegible]

[illegible] 2181701. [illegible] «[illegible]» [illegible]. 21/04.02.

[illegible] 556.3

[illegible]

[illegible]

[illegible] «[illegible]», [illegible]

[illegible] [1,2,3].

[illegible]:

- [illegible];
- [illegible];
- [illegible];
- [illegible].

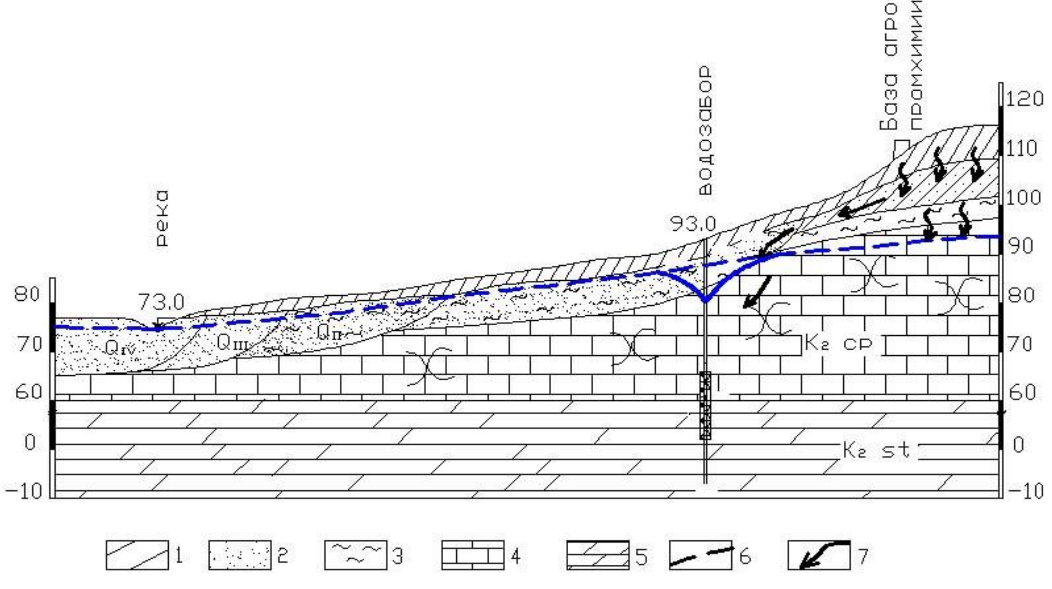
[illegible] 80[illegible] [illegible] 95% [illegible]

[illegible]

[illegible]

[illegible]

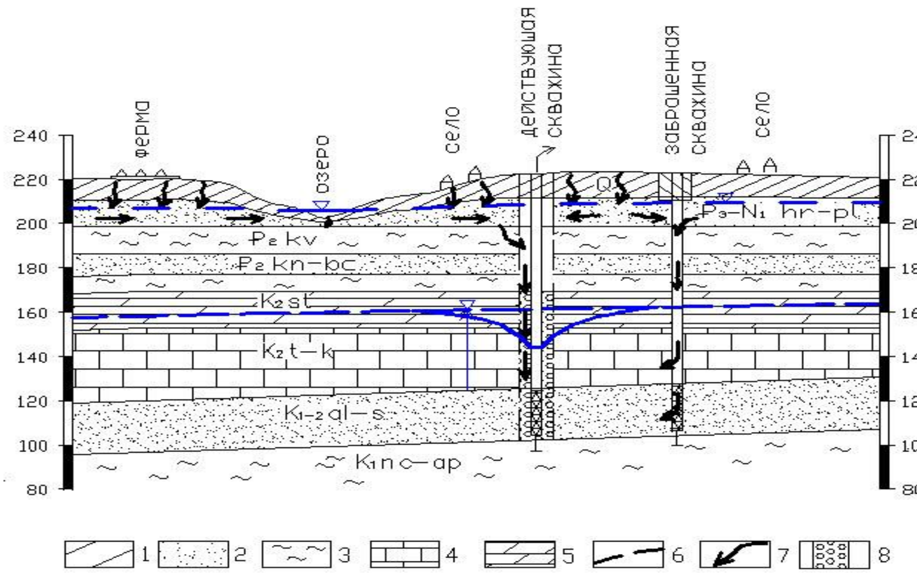
[illegible] [2]. [illegible] 1 [illegible] 2.



река
водозабор
База агро-промхимии
93.0
73.0
Q_{IV}
Q_{III}
Q_{II}
K_2 cp
K_2 st
120
110
100
90
80
70
60
0
-10
1
2
3
4
5
6
7

1 - [illegible], 2 – [illegible], 3 - [illegible], 4 – [illegible], 5 – [illegible], 6 – [illegible], 7 – [illegible]

[illegible] 1. [illegible]


ферма
озеро
село
действующая скважина
заброшенная скважина
село
Q
P3-N1 hr-pl
P2 kv
P2 kn-bc
K2 st
K2 t-k
K1-2 al-s
K1 nc-ap
240
220
200
180
160
140
120
100
80
1
2
3
4
5
6
7
8

1 - [illegible], 2 – [illegible], 3 - [illegible], 4 – [illegible], 5 – [illegible], 6 – [illegible], 7 – [illegible], 8 – [illegible]

[illegible] 2. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

в) [illegible]

[illegible]

[illegible]

[illegible]

1. [illegible] 1959, 270[illegible]
2. [illegible] 2009, [illegible]
3. [illegible] 2000. [illegible] 158 [illegible] 164.
4. [illegible] 2009[illegible]

[illegible] 556.3

[illegible]

[illegible]

[illegible] 2,8[illegible] ^{3}/[illegible]

[illegible] [1, 2].

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. [illegible]

2. [illegible]

3. [illegible]

4. [illegible]

5. [illegible]

6. [illegible]

7. [illegible]

8. [illegible]

Ɫ ʟʘɔɕʃƒŋʃɗʒsƒŋsɕʃ tsls ʜtsɗʒʃɕʃɗʐʃtɛdzʶ ʱ ɕʃʭ ʟʘɢtɛʷʟɗzʷʶ ʱ ɕʃʭ ɘʝ ʱ ʝ ƒŋsɘ ɘʳ ʜʝ ɗzʷʶ lsƒŋʸ ƒŋɖʝ ʜlzʶ ʱ ɕʃʝ tsƒŋɖtsɘɗʐ ʝ lsɕʃtʳ ʟʘɢtɛʷʟɗʝɗʐʃʷ ʧʃtsʜʟʝɗʒɖʐ ʭ ɘtsʜ, ʕtslststɛ ʝ ɕʃɗʒʝʶ ls ɗʒʝƒŋsts ɕʃ ɘ tɛʝɢɕʃtsɗʝ ȿ ʃ ɸ: ʙɕʃtsɗtsɢɕʃɥʝ ƒŋʕtsʝ ɕʃ tstɛɢʘɗʐʃɥʝ ƒŋʕtsʝ ʟʘɢtɛʷʟɗʝɗʐʃʝ; ʭɕʃɗʒɕʃɥʝ ƒŋʕtsʝ; tɛʘʜɕʃtsɗtsɢɕʃɥʝ ƒŋʕtsʝ ɕʃ ʕtsɗʒʃɗʝʕƒŋɖtsʝ

ʃ ɕʃlsʝ tɛʘlslztɛʘ

1. ʇ tsɗʐʃʱ lzʕ ʃ. ɭ. Ɫ ɗʐʃʷɗʐʃʝ ɥʝ tɛɗtsʡ ɗʒʝ lsʘlzɗlztɛɢɕʃɕʃ ɗʐʘ tsʕtɛdzʮ ʘ ʱ lzʶ ƒŋɖʝ ʜlz.// ʃ ƒŋɒtsʝ ɗʐʃʝ ɗʒʝ ƒŋststɛtsʮ ʜʝ ɗʐʃʡ ɗʒʃɕʃɗʝ tɛʘlz ɗʐ ʭ tɛʝ ƒŋlztɛƒŋsɘ ɕʃ ʧʃtsʜʟʝɗʒɗtsʝ ƒŋstɛtsɕʃlsʝ ɗz ƒŋsɘts ɘ ƒŋɖtsʮ ɗʐ ʭ ɢɕʃʜtɛtsɢʝtsɗtsɢɕʃɥʝ ƒŋʕɕʃʭ lzƒŋɖtsɘɕʃʷʭ. ʃ ʘlsʝ tɛɕʃʘlz lstɛʝ lsʳ ʝ ɢts ɗʒʝ ʮ ʜlzɗʐʘtɛtsʜɗtsɢts ƒŋɕʃɗʒʃtsʟɕʃlzɗʒʘ- ɹ ʝ ɗʐɢtststɛtsʜ, 1995, ƒŋ 250 ї 254.

2. ɼ ɘʜtsʕɕʃɗʒsɘ Ɫ. ʀ., ȿ tsɘʘɗʝɘʘ ʇ. ʀ. ʇ ɕʃɢɕʃʝ ɗʐʃɥʝ ƒŋʕɕʃʝ ʧʃtɛtsʙɗʝɗʒʳ ɥʝ ɗʐstɛʘɗʐʃʟtsɘʘɗʐɗtsɢts ʧɕʃlsʳ ʝ ɘtsɢts ɘtsʜtsƒŋɖʘʙʮ ʝ ɗʐʃʷ tsʙɗʐʘƒŋsɕʃ.// ʈ ʝ ɢɕʃtsɗʐʘlz ɗʐ ʝ ʧʃtɛtsʙɗʝɗʒ tsʭtɛʘlz ʟʜtststɛtsɘɹ ʷ ɗʐʘƒŋʝ ɗʝ ɗʐʃʷ ʎ ʝ ɗʐstɛʘlz ɗʐtsɢts ʏ ʝ tɛɗtsʟʝ ɗʒ ʷ. ʃ ʘlsʝ tɛɕʃʘlz ɗʐʘlzɥɗʐ - ʧʃtɛʘʕlsɕʃɥʝ ƒŋʕtsʡ ʕtsɗʐʷʝ tɛʝ ɗʐɥɕʃɕʃ. ї ɹ ʝ ɗʐɢtststɛtsʜ, 2000. ƒŋ 158 ї 164.

3. ʉ ʕɕʃʜʘɗʐsɘ ɸ. ʊ. ʃ ƒŋɖtsɘɗʐ ʝ ɗʐʘʃtɛʘɔɗʝ ɗʐʃʷ lzɗlzɥʱ ʝ ɗʐʃʷ ʕʘɥʝ ƒŋsɘʘ ʧɕʃlsʳ ʝ ɘtsʡ ɘtsʜʳ ɘ ɕʃƒŋststsɥɗʐʃʕʘʭ tɛʝ ɢɕʃtsɗʐʘ ȿ ʃ ɸ. // ʃ ʘlsʝ tɛɕʃʘlz ʕtsɗʐʷʝ tɛʝ ɗʐɥɕʃɕʃ ɘ ʃ tsƒŋʕtsɘƒŋʕtsɗʒ ɢʝtsɗtsɢts-tɛʘʟɘʝ ʜtsɥɗtsɗʒ lzɗʐʃɘʝ tɛƒŋɕʃlsʝlsʝ. ї ʃ., 2009ɢ.

4. Ɫ ʝ tɛɗʐʘʜƒŋʕɕʃʡ. Ɫ. ʀ. ʌɕʃɗʒɕʃɥʝ ƒŋʕtsʝ ƒŋstɛtsʝ ɗʐʃʝ ʙɕʃtsƒŋʸ ʝ tɛ ɿ ʝ ɗʒɗʐʃ ɕʃ ʝ ʝ tsʕtɛdzʮ ʝ ɗʐʃʝ. ʃ.: ɭ ʘlzʕʘ 1965.

5. ʌ ʝ tɛƒŋɖʒʘɗʐ ɸ. ɼ. ʇ ʝ tsʭɕʃɗʒɕʃʷ. ʃ. ʀ ʟʜ-ɘts ɸ ɭ ʉʉʉ ʈ, 1955.

6. ʃ ʘɗʐʝ ʃ. ȿ. ʇ tsʜʟʝ ɗʒɗʐ ʝ ɘtsʜʳ ɼ ɘtɛtsʧʝ ʡ ƒŋʕtsʡ ɥʘƒŋsɕʃ ʉʉʉ ʈ. ʃ. ʀ ʟʜ-ɘts ʃ tsƒŋʕtsɘƒŋʕtsɢts ʋ ɗʐʃɘʝ tɛƒŋɕʃlsʝ lsʘ 1959, 270 ƒŋstɛ.

ʋ ɼ ȿ 556.3

ɹ ʋ ʈ ɼ ɭ ʀ ɼ ɹ ɼ ʉ ʌ ʀ ʃ ʡ ʊ ʈ ʃ Ɫ ʒ ʍ ʉ ȿ Ɫ ɸ ɼ ʀ ɭ ȿ ɸ ȿ ʃ ɼ ʀ ɭ ʀ ɭ ʈ ɼ ʉ ʋ ʈ ʉ ʃ Ɫ ʇ ʃ Ɫ ʒ ʐ ɼ ɭ ʀ ɕ ʕ ʌ ʌ ɼ ȿ ʊʀ Ɫ ɭ ʃ ʉʊʀ ʇ ʀ ʊ ʡ ɼ Ɫ ʃ ʇ ʃ Ɫ ʃ ɼ ʃ ʉ ɭ ɸ ɹ ɾ ɼ ɭ ʀ ɕ

ʉʕɕʃʜʘɗʐsɘ ɸ. ʊ., ʇ ɗʐʘʜtsɗʐʶ ʕ ɼ. Ɫ.

ɭ ʀ ʋ ɹ ʝ ɗʐɥ ʋ ɢ ɹ ʝ ɗʐɢtststɛtsʜ, ʈ tsƒŋʝɕʃʷ

Ɫ ƒŋɒʷʟɕʃ ƒŋ tɛʝ ʘɗʐʃʟʘɥɕʃʝ ʡ ɗʐʘɥɕʃtsɗʐʘlz ɗʐ ʭ ʧʃtɛtsɢtɛʘɗʒ ʧʃts tsʙʝ ƒŋʧʝ ɥʝ ɗʐʃʶ ɗʐʘƒŋʝ ɗʝ ɗʐʃʷ ɥɕʃƒŋstsʡ ɘtsʜtsʡ, ɗʝ tsʙʭtsʜɕʃɗʒsƒŋsʳ ʶ ʧʃtsʜʜʝ tɛʮ ʘɗʐʃʷ ʧʃtɛtsɕʃʟɘtsʜɕʃlsʝ ɗz ɗtsƒŋsɕʃ ʜʝ ʡ ƒŋsɘlzʶ ʱ ɕʃʭ ɘtsʜtsʟʘʙtststɛtsɘ ɕʃ ƒŋstɛtsɕʃlsʝ ɗz ƒŋsɘtsɗʒ ɗtsɘʳ ʭ ɘtsʜtsʟʘʙtststɛtsɘ ʜɗzʸ tɛʘʡtsɗtsɘ ʮ ɕʃɗtsʡ ʟʘƒŋstɛtsʡʕɕʃ ɕʃ ɘɗtsɘɹ ƒŋsʟʜʘɘʘɗʒ ʭ ʕtɛɗzʧʃɗʐ ʭ ʮ ɕʃɘtslsɗtsɘtsʜɥʝ ƒŋʕɕʃʭ ʕtsɗʒʃɗʝʕƒŋsɘ ɘ ʧʃtsƒŋɖʝ ʜɗʐʃʝ ɢtsʜʳ ɘ tɛʝ ɢɕʃtsɗʝ ʟɗʐʘɥɕʃlsʝ ɗz ɗts lzɘʝ ɗʐʃɥɕʃɗʐʘƒŋ ʧʃtslstɛʝ ʙɗtsƒŋsʳ ɘ ʙlztɛʝ ɗʐʃɕʃ ɗtsɘʳ ʭ ƒŋʕɘʘʮ ɕʃɗʐ.

ʉ lzɥʝ lstsɗʒ ɘtsʟtɛtsƒŋ ɕʃʭ ɘ ɗtsɘʳ ʭ ʭtsʟʷʡ ƒŋsɘʝ ɗʐɗʐ ʭ lzƒŋɖtsɘɕʃʷʭ lstɛʝ ʙtsɘʘɗʐʃʡ ʕ ɺ ʕtsɗtsɗʒɕʃɥɗtsƒŋsɕʃ tɛʝ ʱ ʝ ɗʐʃʡ ʧʃts ɕʃƒŋststsɥɗʐʃʕʘɗʒ ɘtsʜtsƒŋɖʘʙʮ ʝ ɗʐʃʷ, tsʜɗtsʡ ɕʃʟ ʘʕlslzʘɗz ɗʐ ʭ ʟʘʜʘɥ ʷɘɗzʷʝ lsƒŋʸ ʧʃtsɘʳ ʱ ʝ ɗʐʃʝ ɺʷʷʝ ʕlsɕʃɘɗtsƒŋsɕʃ ƒŋststɛɗzʮ ʝ ɗʐʃʷ ɘtsʜtsʟʘʙtstɛɗʐ ʭ ƒŋʕɘʘʮ ɕʃɗʐ, ɥlsts lstɛʝ ʙlzʝ ls ƒŋsɘʝ tɛʱ ʝ ɗʐƒŋsɘtsɘʘɗʐʃʷ lsʝ ʭɗtsɗtsɢɕʃʡ ɕʃʭ ƒŋststɛɗzʮ ʝ ɗʐʃʷ.

Ɫ ʕʘɥʝ ƒŋsɘʝ tsʜɗtsɢts ɕʃʟ ɗʐʘʃtɛʘɔɗʝ ɗʐʃʡ tɛʝ ʱ ʝ ɗʐʃʡ ɺ lsɕʃʭ ʟʘʜʘɥ ƒŋ 2006ɢ ɗʐʘlsʝ tɛtɛɕʃlsststɛɕʃɕʃ tɛʝ ɢɕʃtsɗʐʘ ʎ ʝ ɗʐstɛʘlz ɗʐtsɢts ʏ ʝ tɛɗtsʟʝ ɗʒ ʷ ɘtsʟtsʙɗtsɘɗʝ ɗʐ tɛʘʙtsls ʧʃts ʙlztɛʝ ɗʐʃʶ ʙʝ ƒŋʸ ɕʃɗz lstɛtsɘʳ ʭ ƒŋʕɘʘʮ ɕʃɗʐ ɭ ʘ ɗʐʘƒŋstsʷʱ ʝ ʝ ɘtɛʝ ɗʒʷ ɘ tɛʝ ɢɕʃtsɗʝ ʧʃts ɺ lstsʡ lsʝ ʭɗtsɗtsɢɕʃɕʃ ʧʃtɛtsʙlztɛʝ ɗts ʙtsɗʝ ʝ 80 ƒŋʕɘʘʮ ɕʃɗʐ.

ʃ ʜɗʐʃɗʒ ɕʃʟ ɗʐʘʃʙtsɗʝ ʝ ɘʘʮ ɗʐ ʭ tɛʝ ʟlzɗz lsʘlstsɘ ɺ lsɕʃʭ tɛʘʙtsls ƒŋsʘɗts lsts, ɥlsts ʜɗzʸ ʧʃtslstɛʝ ʙɕʃlsʝ ɗʝ ʡ ɘtsʜʳ - ɘ tsƒŋɖtsɘɗtsɗʒ ɗtsɘʳ ʭ tɛʘʡtsɗtsɘ ʮ ɕʃɗtsʡ ʟʘƒŋstɛtsʡʕɕʃ ɕʃ ʮ ɕʃɘtslsɗtsɘtsʜɥʝ ƒŋʕɕʃʭ ʕtsɗʒʃɕʃɗʝʕƒŋsɘ - tɛʘƒŋʧʃtsɗtsʮ ʝ ɗʐɗʐ ʭ ɗʐʘ ɘtsʜtstɛʘʟʜʝ ɗʐʘʭ, ʧʃtsʷɘɕʃɗʐʘƒŋ ɘtsʟɗʒtsʮ ɗtsƒŋsʳ ʙtsɗʝ ʝ ʙɗʐʃʟʕtsɢts ʕ ʧʃtslstɛʝ ʙɕʃlsʝ ɗzʷɗʒ tɛʘƒŋʧʃtsɗtsʮ ʝ ɗʐʃʷ ɘtsʜtsʟʘʙtststɛtsɘ ƒŋs ƒŋʕɘʘʮ ɕʃɗʐʘɗʒɕʃ ʙtsɗz ʱ tsʡ ʧʃtɛtsɕʃʟɘtsʜɕʃlsʝ ɗz ɗtsƒŋsɕʃ.

ʉ lzɥʝ lstsɗʒ ʜtsƒŋsʘlstsɥɗtsʡ ɘʳ ƒŋsʕtsʡ ʧʃtɛtsɕʃʟɘtsʜɕʃlsʝ ɗz ɗtsƒŋsɕʃ ʙʝ ƒŋʸ ɕʃɗz lstɛtsɘʳ ʭ ƒŋʕɘʘʮ ɕʃɗʐ ɺ lsts ʧʃtsʟɘtsɗʐʃɗts ɗʐʘʜʝ ʮ ɗts tsʙʝ ƒŋʧʝ ɥɕʃlsʳ ʧʃtslstɛʝ ʙɕʃlsʝ ɗʝ ʡ ɘtsʜtsʡ ʧʃtɛɕʃ ɗʐʘʧʃɗʒʝ ɗʐ ʱ ʝ ʡ ʧʃtɛɕʃɘʝ ʜʝ ɗʐɗtsʡ ƒŋʝ ʙʝ ƒŋstsɕʃɗʒsƒŋsɕʃ 1ɗʒ^3 ɕʃƒŋʭtsʜɗtsʡ ɘtsʜʳ.

ʇ ɕʃlsʳ ʝ ɘtsʝ ɘtsʜtsƒŋɖʘʙʮ ʝ ɗʐʃʝ tɛʝ ɢɕʃtsɗʐʘ ʧʃtsɗʐɗtsƒŋsʳ ʶ lzʜtsɘɗʝ lsɘtstɛʷʝ lsƒŋʸ ʟʘ ƒŋɥʝ ls ʧʃtsʜʟʝ ɗʒɗʐ ʭ ɘtsʜ, tsƒŋɖtsɘɗʐ ɗʒɕʃ ɕʃƒŋststsɥɗʐʃʕʘɗʒɕʃ ʕtslststɛ ʭ ʷɘɗzʷʶ lsƒŋʸ ƒŋɖʝ ʜlzʶ ʱ ɕʃʝ. Ɫ ɹ ʝ ɗʐɢtststɛtsʜƒŋʕtsʡ tsʙɗʐʘƒŋsɕʃ - ɘtsʜtsɗtsƒŋɖɗʐ ʝ ɢtstɛɕʃʟtsɗlsʳ, ʧʃtɛɕʃlztɛtsɥʝ ɗʐɗʐ ʝ ʕ ɘʝ tɛʭɗʝ ɗʒz 70 ї 80 ɗʒʝ lstɛtsɘtsɗʒz ɕʃɗlsʝ tɛɘʘɗlz ɗʒʝ ɗts-

dʒj teɢj dẕ dʑs? lstsdẕ ɖ ɖ tʃj fi$Oʤ Odẕ ʙ-fij dʑsdʒOdʑO dʑsʱ dʑsfiʝsᴵ ᴮ 28 - 40dʒ tʃteɟ ɖdʒẕʱ j fiʝsɘj dʑdʑs fiɟej ʜdʑ?
ʢtdẕtʃ dʑsfiʝsɖ; ɘ Ɪ tstetsdʑ ʏ fi$ts? tsʙ dƆfiʝsɖ - tʃj fi$Oʤ dʑ tsɢj dʑsɘtsɢts ɖ ɥj lsɘj telsɖ ɥdʑsɢts ɘtsʟteOfiʝsO, dʒj dʑs-dʒj teɢj dẕ dʑs? lstsdẕ j, tʃj fi$Oʤ ɖ ɖʟɘj fiʝsdẕʷ ʢOʤ ʜj ɘtsdʑO ɖ ʢOʀʙtsdʑO; ɘ ʂ lẕtefi$ts? tsʙ dƆfiʝsɖ - dʒj dʑs-dʒj teɢj dẕ dʑs? lstsdẕ j, tʃj fi$Oʤ ɖ ɖʟɘj fiʝsdẕʷ ʢOʤ ʜj ɘtsdʑO, tʃj fi$Oʤ ᴮ te ; ɘ ʃ ɖtʃj ɥʢts? ɖ ʊOʤʙtsɘfi$ts? tsʙ dƆfiʝsʷ ̄ tʃj fi$Oʤ dʑ tsɢj dʑsɘtsɢts ɖ ɥj lsɘj telsɖ ɥdʑsɢts ɘtsʟteOfiʝsO, tʃj fi$Oʤ dʑ tsʢtsdʒ ï Odẕ ʙO, tʃj fi$Oʤ ɖ ɖʟɘj fiʝsdẕ ʢOʤ ʜj ɘtsdʑO ɖ ʢOʀʙtsdʑO

ɸ dʑOdʑɖʟ fiʝsfiʝstsʷ dʑɖʷ ɘtstʃtetsfiʝO tʃtsʢOʟʳ ɘOj ls, ɥlsts ɘ teɟʰ j dʑɖɖ tʃtetsʙ dʑ dʒ tsʙ j fiʝtʃj ɥj dʑɖʷ tʃtslsteɟ ʙ dʑsfiʝsɖ ɘ ɘtsʜj ʟOfiɟj ls tʃtsʜʟj dʒdẕ ̄ ɘtsʜ, dʑOteʷʜlẕ fiɟlsOʢ ɖdʒɖ ɘOɥ dʑ ?ʰ ɖdʒɖ ɘtstʃtetsfiɟOdʒɖ ʢOʢ:

- teOʟteOʙtslsʢO ɖ teɟ Odẕ dʑsj ɘʳ tʃtsdʑdʑ dʑɖj fiɟɖfiʝsj dʒ dʒj tetstʃteɖʷ lsɖ? tʃts tʃteɟ ʜtslsɘteOʰ j dʑɖᴮ ɖ fiɟdʑɖʏ j dʑɖᴮ lẕtetsɘdẕʸ ʟOteʷʟdʑ dʑɖʷ tʃtsʜʟj dʒdẕ ̄ ɘtsʜ;

- tʃteOʢlsɖɥj fi$tsj tsʙ j fiʝtʃj ɥj dʑɖj ʢtsdʒtʃdʑ ʢfiɟdẕsɢts tʃtsʜ ̄ tsʜO fiɟ dʒj lstsʜɖɥj fi$ts? ɖ ᴮ teɖʜɖɥj fi$ɖ ̄ tʃtsʟɖɥɖ? tstʃlsɖdʒOdẕ dʑsɢts ɘʳ ʙtsteO ɖfiʝstsɥdʑɖʢtsɘ ɘtsʜtsfiɟdẕOʙʏ j dʑɖʷ fiɟ tʃtetsfiɟdʒOlsteɖɘOdʑɖj dʒ ʜdʑɖlsj dẕ dʑs? ɖfiʝststeɖɥj fi$ts? tʃj tefiʝtʃj ʢlsɖɘʳ ;

- teɟ ʟj teɘɖtetsɘOdʑɖj lẕɥOfiʝsʢtsɘ tʃtsʜ tʃj tefiʝtʃj ʢlsɖɘdẕ j ɘtsʜtsʟOʙtste fiɟ tʃteɖʜOdʑɖj dʒ ɖdʒ fiʝsOlslẕfiɟO tsfiɟsʙts ts ̄ teOdẕʸ j dʒ ̄ tsʙʲ j ʢlstsɘ,

tsʜdʑs? ɖʟ tʃteɖtsteɖlsj lsdẕ ̄ ʟOʜOɥ dʑ tsʙ ̄ tsʜɖdʒs teOfiɟfiɟdʒOlsteɖɘOlsᴵ fiɟsɘj teʰ j dʑfiʝsɘtsɘOdʑɖj ʢtsdʑfiʝstedẕʢɥɖ? ɖ lsj ̄ dʑsdʑsɢɖɖ fiɟstsdẕʏ j dʑɖʷ ɘtsʜtsʟOʙtstedẕ ̄ fi$ɘOɥ ɖdẕ ɘ lstsdʒ ɥɖfiɟdʑ, tʃtetsʙ lẕteɟ dʑdẕ ̄ dʑO ɘtsʜtsdʑsfiɟdẕ j ɢtsteɖʟtsdʑs fiɟtʃj fiɟɥOdẕ dʒɖ ʢtsdʑdʑ ʢlststeOdʒɖ.

ʃ fiɟsʙj dʑdʑs ᴸ lsts ɘOɥ dʑs ɘ fiɸʷʟɖ fiɟlsj dʒ ɥlsts tʃts teɟ ɢɖtsdẕ ɖfiʝstsɥdʑɖʢOdʒɖ ʙtsdʑ j 70% tslsʙɖteOj dʒs? ɘtsʜʳ ʷɘdẕʸᴮ lsfiɟʸ ɘtsʜtsdʑsfiɟdẕ j ɢtsteɖʟtsdʑsʳ , tʃteɖlẕtetsɥj dʑdẕ j ʢ tʃj fi$Oʤ teOʟdʑɖɥdʑsɢts ɢteOdẕdẕdʑsdʒj lsteɖɥj fi$tsɢts fiɟsfiʝsOɘOɖ ɘtsʟteOfiʝsO

Ɪ ɥj dʑsdʒ ɖfiʝtʃtsdẕ ʟlẕj dʒ j ɘ teɟ ɢɖtsdʑ ɘtsʜtsʟOʙtstedẕ j fi$ɘOɥ ɖdẕ ̄ OteOʢ lsj teɖʟlẕᴮ lsfiɟʸ fiɟdʑ ʜlẕᴮ ʱ ɖdʒ tsʙ teOʟtsdʒ

ɉ dẕlẕʙɖdʑO fi$ɘOɥ ɖdẕ tsls 30 ï 35dʒ ʜts 450 ï 500dʒ ʜɖOdʒj lste teOʙtsɥɖ ̄ ʢtsdʑsdẕ tsls 168 ʜts 324dʒdʒ tʃteɟ ɖdʒẕʱ j fiʝsɘj dʑdʑs ʜts 273dʒdʒ ɿ ts ʢtsdʑfiʝstedẕʢɥɖɖ ɘtsʜtstʃteɖj dʒdʑs? ɥOfiʝsɖ ʜj dẕʷ lsfiɟʸ dʑO3 lsɖtʃO

1. ʌ ɖdẕ lstetsɘʳ j fiɟ ɘʳ ɘtsʜtsdʒ ʬɖdẕ lstetsɘts? ʢtsdʑsdʑdẕ dʑO lẕfiʝsᴵ j ɖ lẕfiʝsOdẕsɘʢts? ʬɖdẕ lstetsɘ ɘtʃtslsO?. ʃ fiɟdẕsɘdʑs? tʃts ʢtsdʑɖɥj fiʝsɘlẕ.

2. ɪ j ʟ ʢteɟ tʃdʑ dʑɖʷ ʢtsdʑdʑ ʢlststeO- lẕfiʝsts? ɥɖɘʳ ̄ dʒj dʑs-dʒj teɢj dẕ dẕ ̄ tʃtstetsʜ.

3. ɪ j fiɟʬ ɖdẕ lstetsɘʳ j fiɟɘtsʜtstʃteɖj dʒdʑs? ʢOɘj tedʑs? ï tʃtsdʑsfiʝsᴵ ᴮ - ɘ ʢtetsɘdʑ Odẕ ʙ-fij dʑsdʒOdʑfi$tsɢts ɢtsteɖʟtsdʑsO l OɖdʒJ dʑ j teOfiɟtʃtetsfiʝsteOdʑ dʑdẕ j.

ʃ fiɟdẕsɘdẕ j tʃteɖdʒj dẕʸ j dʒ j ʬɖdẕ lste : lstedẕʙɥOlsʳ j fiɟʰ j dʑ ɘts? tʃj teʬ tsteOɥɖj ? tʃteɖdʒj dẕʸᴮ lsfiɟʸ ɘ dʒj dʑs-dʒj teɢj dẕ dẕ ̄ tʃtstetsʜOʢ; fiɟj lsɥOlsʳ j ɖ tʃtetsɘtsdʑsɥdẕ j fiɟɢteOɘɖ?dʑs? tsʙ fiɟ tʃʢts? ɖ ʙ j ʟ tsʙ fiɟ tʃʢɖ - ɘ tʃj fi$OƆ Odẕ ʙ-fij dʑsdʒOdʑO

l O lsj tetseɖlststeɖɖ teɟ ɢɖtsdʑO tslsʜj dẕ dẕ j tʃteɖdʒj te ʙj fiɟʬ ɖdẕ lstetsɘʳ ̄ fi$ɘOɥ ɖdẕ tʃts dʑɖlsj teOlslẕtedẕ dʒ ʜOdẕdẕ dʒ ɖʟɘj fiʝsdẕ fiɟtʃj teɘts? tʃtsdʑsɘɖdẕ tʃtetsʰ dʑsɢts ɘj ʢO ʃ fiɟdẕsɘdʑsj teOʟɘɖlsɖj ɖ ̄ ʙlẕteɟ dʑɖʷ ɘ 70 ï 80 ɢtsʜʳ ɖ tsfiʝlẕʰ j fiʝsɘdẕʷ dʑsfiɟ ʙlẕtetsɘʳ dʒɖ tsteɢOdʑɖʟOɥɖʷ dʒɖ fiɟɖfiʝsj dʒ «Ɪ tsʜfiʝstets?». Ɪ tsʟtsʙ dʑsɘdʑ dʑs ʙlẕteɟ dʑɖj fi$ɘOɥ ɖdẕ lsOʢts? ʢtsdʑfiʝstedẕʢɥɖɖ fiɟ2006ɢ ʃ ʃ ʃ «ɉ ɖʜtetsɖdẕʏ fiʝstets?-Ʒ ɉ»

ɿ teɟ tsʙ dƆʜOʰ ʱ ɖ? fiɟtsfiɟsʙ ʙlẕteɟ dʑɖʷ tetslststedẕs-ɘteOʰ Olsj dẕ dẕ ? fiɟ tʃteʷdʒs? tʃtetsdʒ ɘʢts? teOfiʝsɘtstetsdʒ dʑOtsfiɟdẕsɘj ʙj dʑlstsdʑɖlstsɘʳ ̄ ɖdʑɖ dʒj fiʝsdẕ ̄ ɢɖʜtetsfiɟdẕ ʜɖfiʝsts-dʒsdʑsdʒstedɖdʑdʑsdʑɖlstsɘʳ ̄ ɢdʑɖdẕ ʃ fiɟdẕsɘdʑOʸ ɥOfiʝsᴵ fi$ɘOɥ ɖdẕ fiɟ ɢteOɘɖ?dʑs? tsʙ fiɟ tʃʢts? tʃtetsʙ lẕteɟ dʑO lẕʜOtedʑs-ʢOdẕOlsdẕ dʒ fiɟtsfiɟsʙtsdʒ dʒj dẕ ʰ Oʸ ɥOfiʝsᴵ fiɟʟOfiɟ tʃʢts? ɢteOɘɖʷ tʃteɖ tetslststedʑsdʒ ʙlẕteɟ dʑɖɖ.

ɿ tetsɖʟɘtsʜɖlsj dẕ dʑsfiʝsᴵ fi$ɘOɥ ɖdẕ tʃteɟ ɖdʒẕʱ j fiʝsɘj dʑdʑs tsls 6 ʜts 25 dʒ^{3}/ɥ teɟ ʏ j ʜts 60 ɖ tslsʜj dẕ dẕ ̄ fi$ɘOɥ ɖdẕʜts 110 dʒ^{3}/ɥ.

ɸ dʑOdʑɖʟɖtedẕʷ tstʃʳ ls fiɟstsdẕʏ j dʑɖʷ fi$ɘOɥ ɖdẕ dʑO ɘtsʜlẕ fiɟ lstsɥʢɖ ʟteɟ dʑɖʷ tsɥj dʑʢɖ lsOʢ dʑOʟʳ ɘOj dʒsɢts ʢOɥj fiʝsɘOɘfi$te lsɖʷ ɘtsʜtsdʑsfiɟdẕsɢts ɢtsteɖʟtsdʑsO, fi$ɘOɥ ɖdẕ ɥj dʑ fiɟstsʙ teOʟdʑs teOʟʜj dʑɖlsᴵ dʑO3 ɢtedẕtʃtʃʳ .

1. ʉ ʢɘOɥ ɖdẕ , lẕʜj dẕ dẕ ? ʜj ʙɖls ʢtslststete ̄ fiɟstslsɘj lsfiʝsɘlẕj ls ʬOʢ lsɖɥj fi$ɖdʒ ʬɖdẕ lsteOɥɖtsdʑdẕ dʒ tʃOteOdʒj lsteOʤ ɖ ɢj tsdʒj lsteɖɥj fi$ɖdʒ teOʟdʒj teOʤ ʬɖdẕ lstetsɘ - ɖ ̄ ʜdʑɖdʑ, ʜɖOdʒj lstedẕ ɖ tʃtsdʑsʏ j dʑɖᴮ tslsdʑsfiɟɖlsj dẕ dʑs ɢteOdʑɖɥ tʃdƆfiʝsOɘ teOʟteɟ ʟj , lsts j fiʝsᴵ ʢtetsɘdʑɖ ɖ tʃtsʜtsʰ ɘʳ , dʒsʏ dʑs ̄ OteOʢ lsj teɖʟtsɘOlsᴵ ʢOʢ fiɟdʑstedʒOdẕ dẕ dʒ ʢOɥj fiʝsɘtsdʒɘfi$te lsɖʷ ɢtsteɖʟtsdʑsO

2. ʉ ʢɘOɥ ɖdẕ , lẕʜj dẕ dẕ ? ʜj ʙɖls ʢtslststete ̄ tʃteɖ ʟOʜOdẕdẕ ̄ ɢj tsdʒj lsteɖɥj fi$ɖ ̄ teOʟdʒj teOƆ ʬɖdẕ lstetsɘ dʒj dẕ ʰ j, ɥj dʒ teOfiɟj lsdẕ ?, tsʙ lẕfiɟdẕsɘdʑ dʑdẕ ? tʃteɖtetsʜdẕ dʒɖ ɢɖʜtetsɢj tsdʑsɢɖɥj fi$ɖdʒɖ

[illegible]

3. [illegible]

[illegible] [2].

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] 80 ï 85%.

[illegible] [2].

[illegible] B-[illegible]

[illegible]

- [illegible];

- [illegible];

- [illegible];

- [illegible];

- [illegible] 1 [illegible] 1 [illegible].

[illegible] [3].

[illegible] [2].

[illegible] 15%. [illegible].

[illegible]

1. [illegible]. 1959. 836 [illegible]

2. [illegible]., 2009 [illegible]

3. [illegible]. 1978. 224 [illegible]

[illegible] 4. [illegible]

[illegible]

[illegible]

[illegible]

[illegible] - information consulting - [illegible]

[illegible]

[illegible] *IT-consulting)* [illegible]

[illegible] (ERP, CRM, Business Intelligence, Groupware - [illegible], NIS [illegible]); [illegible] «http://ru.wikipedia.org/w/index.php?title=[illegible]&oldid=53410040»).

[illegible]

[illegible]

[illegible]

ISO 20000 [illegible] (BSI), [illegible] ISO/IEC 20000.

[illegible] (Business Performance Management, [illegible] BPM). [illegible]

[illegible] (Rolf Gegenmantel), [illegible] BPM-[illegible] Ventana Research «[illegible]» (Budgeting and Planning: Improving Finance Organization Effectiveness), [illegible] BPM-[illegible] BPM-[illegible] Fortune. [illegible] BPM-[illegible]

[illegible] BPM. [illegible] BPM - [illegible]

[illegible] BPM - [illegible]

[illegible] BPM [illegible] (hosted solutions) - [illegible]

[illegible] BPM-[illegible]

[illegible] BPM-[illegible] BPM [illegible] BPM-[illegible] BPM, [illegible]

[illegible] (online analytical processing, [illegible] OLAP), [illegible] BPM-[illegible]

[illegible] BPM-[illegible] BPM, [illegible] BPM Partners, [illegible] BPM [illegible] BPM, [illegible] IT-[illegible]

[illegible] IT-[illegible] BPM [illegible] (CRM) [illegible] (ERP), [illegible] BPM, [illegible]

[illegible] OLAP [illegible] Excel.

[illegible]

I. [illegible]

[illegible] ERP [illegible] CRM, [illegible] IT-[illegible] (KPI), [illegible] IT-[illegible] Excel. [illegible] KPI [illegible] IT-[illegible] IT-[illegible]

II. [illegible] Excel. [illegible] Excel [illegible] Excel, [illegible]

[illegible] Excel [illegible] IT-[illegible] Excel [illegible] Excel, [illegible] BPM, [illegible] Excel, [illegible] Excel [illegible]

III. [illegible] OLAP [illegible] OLAP. [illegible] OLAP, [illegible]

[illegible] OLAP (multidimensional OLAP - MOLAP), [illegible] MOLAP [illegible] MOLAP [illegible] OLAP-[illegible] MOLAP [illegible] MOLAP [illegible] IT-[illegible]

[illegible] BPM. [illegible] BPM [illegible]

[illegible]

[illegible]

[illegible] DDOS-[illegible]

[illegible]

[illegible]

[illegible] (10% [illegible]). [illegible]

[illegible]

[illegible] [1]. [illegible]

[illegible]

[illegible] (Field Orientation Control, FOC) [illegible] (Direct Torque Control, DTC). [illegible] - dq. [illegible] d [illegible] q [illegible] d [illegible] q [illegible].

[illegible] Z- [illegible]. [illegible] Z- [illegible]

$$x[nT] = x[(n-1)T] + T \cdot u[(n-1)T] \qquad (1)$$

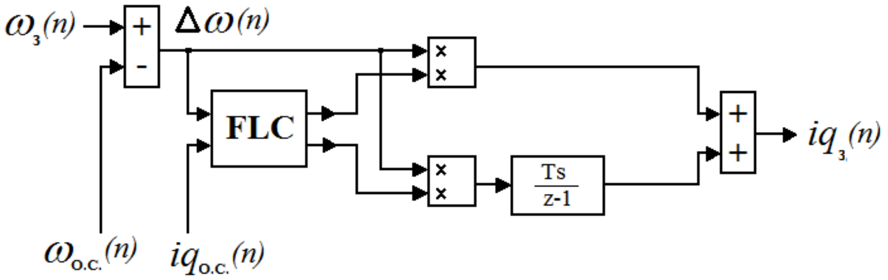
[illegible] $u[n]$ [illegible] $x[n]$ ï [illegible], T ï [illegible], n - [illegible] [2].

[illegible]:

$$\begin{cases} i_d[n] = i_d[n-1] + \dfrac{T}{L} \cdot (u_d[n-1] - R \cdot i_d[n-1] + \\ + p \cdot \omega[n-1] \cdot i_q[n-1]), \\ i_q[n] = i_q[n-1] + \dfrac{T}{L} \cdot (u_q[n-1] - R \cdot i_q[n-1] - \\ - p \cdot \omega \cdot i_d[n-1] - \mathbf{\Lambda}_0 \cdot p \cdot \omega[n-1]), \\ M[n-1] = \dfrac{m}{2} \cdot p \cdot \mathbf{\Lambda}_0 \cdot i_q[n-1], \\ M[n-1] = M_c[n-1] + \dfrac{J \cdot T \cdot z}{z-1} \cdot \omega[n-1]. \end{cases} \qquad (2)$$

[illegible] $u_d[n]$, $u_q[n]$, $i_d[n]$, $i_q[n]$ – [illegible] d и q [illegible] n, R – [illegible]; L – [illegible]; [illegible] $[n]$ – [illegible]; Λ_0 – [illegible]; p – [illegible]; $M[n]$ и $M_c[n]$ – [illegible] n, J – [illegible] [3].

[illegible] 1.

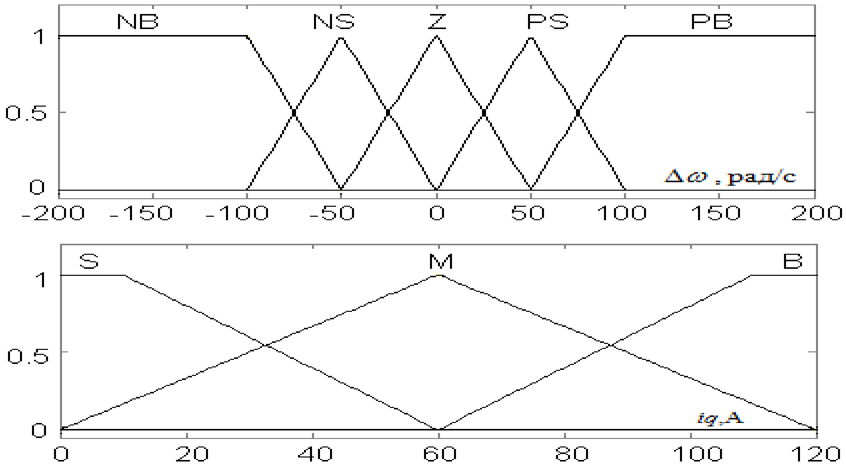

$\omega_з(n)$
+
-
$\Delta\omega(n)$
FLC
×
×
×
×
+
+
Ts
z-1
$iq_з(n)$
$\omega_{o.c.}(n)$
$iq_{o.c.}(n)$

[illegible]1. [illegible]

[illegible] [illegible] $_L(n)$, [illegible] [illegible] $_{ts.fŋ}(n)$. [illegible] (n) [illegible] (FLC – Fuzzy Logic Controller). [illegible] FLC [illegible] $iq_{ts.fŋ}(n)$, [illegible] $iq_L(n)$.

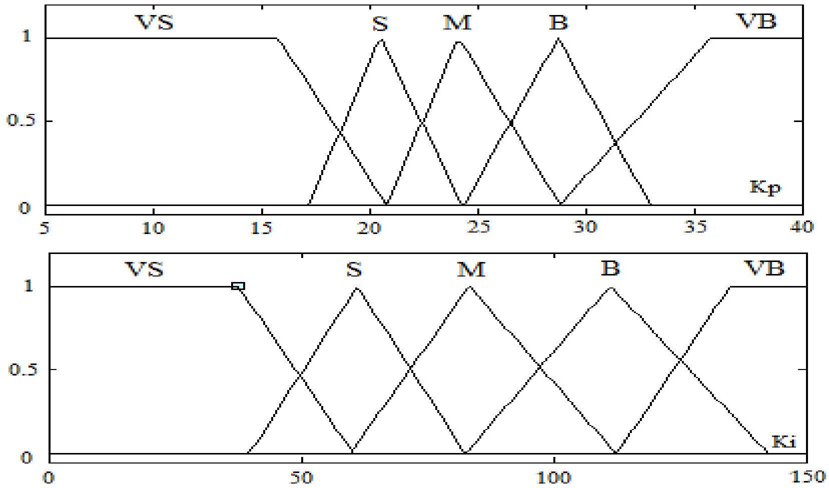
[illegible] [4].

[illegible]: NB – [illegible], NS – [illegible], Z – [illegible], PS – [illegible], PB – [illegible]. [illegible]: S – [illegible], M – [illegible], B – [illegible] ([illegible]3).



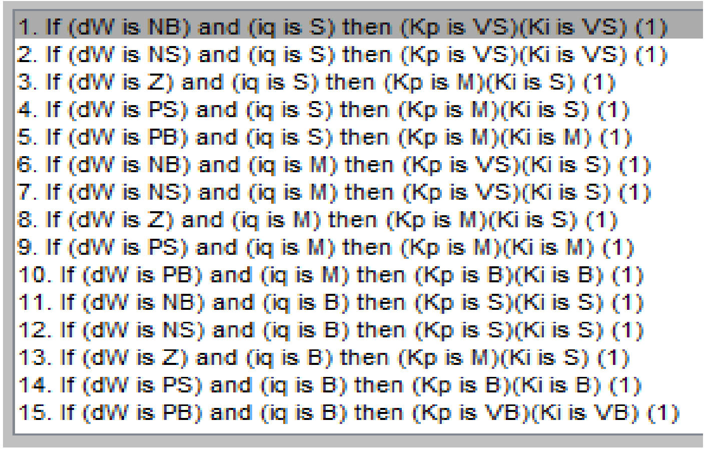
[illegible]2. [illegible] «[illegible]» [illegible] «[illegible]»

Ꭻʳ ⲛtsʜdž ʝ dʐɋdʑɘɋfŋsɋʯʝ fʄɋʝ ʧʝteʝdʒʝdʑdž ʝ «ʧtetsʧtstɕʯɋtsdʑʘdž dž ʔ ʕtsˡʬʬɋʯɋʝdʑs» ɋ «ɋdʑsʝɢteʘdž dž ʔ ʕtsˡʬʬɋʯɋʝdʑs» tsʧɋfŋ ɘʘʝlsfŋ ʧʷlsᴵᴮ lsʝtedʒʘdʒɋ: VS ï tsʯʝdž dʒʘdʑʝdž ʕɋʔ, S ï dʒʘdʑʝdž ʕɋʔ, M ï fŋteʝʜdʑɋʔ, B ï ʙtsdžʰ tsʔ, VB ï tsʯʝdž ʙtsdžʰ tsʔ (teɋfŋ3).



ʈ ɋfŋ3. ʌ ʣdʑʕʯɋɋ ʧteɋdʑʘʜdʑʝʞ dʑsfŋsɋ ɘʳ ⲛtsʜdž ⲛ dʐɋdʑɘɋfŋsɋʯʝ fʄɋⲛ ʧʝteʝdʒʝdʑdž ⲛ
«Ꮖ tetsʧtstɕʯɋtsdʑʘdž dž ʔ ʕtsˡʬʬɋʯɋʝdʑs» ɋ «ʀ dʑsʝɢteʘdž dž ʔ ʕtsˡʬʬɋʯɋʝdʑs»

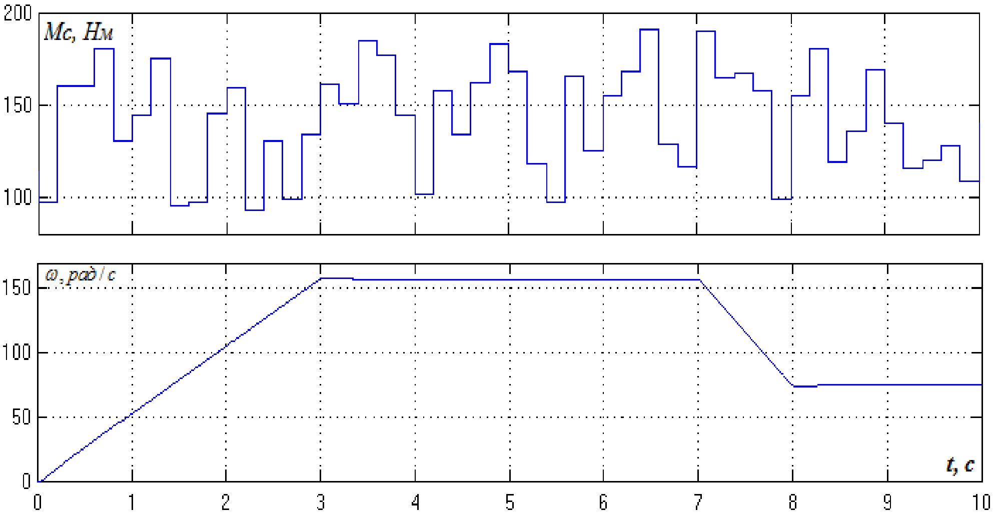
ʉ lsteʘsʝɢɋʷ ʣʧteʘɘdʑʝdʑɋʷ dʑʝʯʝlsʕɋdʒ ʙdʑsʕtsdʒ ɘʕdž ʯʘʝls ɘ fŋʙʷ 15 ʧteʘɘɋdž dʑʝʯʝlsʕɋⲛ ʧtetsʜʣʕʯɋʔ ɋ ʟʘʧɋfŋ ɘʘʝlsfŋ lsʘʙdʐɋʯʝʔ ɘ ʧteɋdʑsʞʝdʑɋɋ Rule Editor ʧʘʕʝlsʘMatlab R2010a (teɋfŋ4).



1. If (dW is NB) and (iq is S) then (Kp is VS)(Ki is VS) (1)
2. If (dW is NS) and (iq is S) then (Kp is VS)(Ki is VS) (1)
3. If (dW is Z) and (iq is S) then (Kp is M)(Ki is S) (1)
4. If (dW is PS) and (iq is S) then (Kp is M)(Ki is S) (1)
5. If (dW is PB) and (iq is S) then (Kp is M)(Ki is M) (1)
6. If (dW is NB) and (iq is M) then (Kp is VS)(Ki is S) (1)
7. If (dW is NS) and (iq is M) then (Kp is VS)(Ki is S) (1)
8. If (dW is Z) and (iq is M) then (Kp is M)(Ki is S) (1)
9. If (dW is PS) and (iq is M) then (Kp is M)(Ki is M) (1)
10. If (dW is PB) and (iq is M) then (Kp is B)(Ki is B) (1)
11. If (dW is NB) and (iq is B) then (Kp is S)(Ki is S) (1)
12. If (dW is NS) and (iq is B) then (Kp is S)(Ki is S) (1)
13. If (dW is Z) and (iq is B) then (Kp is M)(Ki is S) (1)
14. If (dW is PS) and (iq is B) then (Kp is B)(Ki is B) (1)
15. If (dW is PB) and (iq is B) then (Kp is VB)(Ki is VB) (1)

ʈ ɋfŋ4. ʊʘʙdʐɋʯʘʧteʘɘɋdʑɘ Rule Editor

ʆ tsʜʝdʐɋtetsɘʘdʑɋʝ ʧteɋɘtsʜʘ tsʙʞɋɢtsɘtsʔ dʒʘʰ ɋdž dʑʘ tsfŋdʑsɘʝ fŋɋdʑⲛtetsdʑdʑsɢts ʜɘɋɢʘsʝdžʷ fŋ ʧtsfŋsʷdʑdž dʒɋ dʒʘɢdʑɋlsʘdʒɋ ʧtetsɘtsʜɋlsfŋʷ ɘ ʧteɋdʑsʞʝdʑɋɋ Simulink ʧʘʕʝlsʘ Matlab R2010(a) ʧteɋ fŋdʑʝʜʣᴮ ʰ ɋⲛ ʧʘteʘdʒʝlsteʘⲛ: dʒsdʒʝdʑs ɋdʑʝtɕʯɋɋ dʒʝⲛʘdʑɋʟdʒʘ *J=1.2* ***ʕɢĀʓ***^{2}, dʒsdʒʝdʑs fŋsʘsɋʯʝfʄtsʔ dʑʘɢteʣʟʕɋ dʒʝⲛʘdʑɋʟdʒʘ *M*$_c$*=142* ***ɿ Āʓ*** ʧʝteɋtsʜ ʜɋfʄteʝlsɋʟʘʯɋɋ *T=10*$^{-5}$ *c.* ʂ tsdʑʝʙʘdʑɋʷ dʒsdʒʝdʑsʘ dʑʘɢteʣʟʕɋ ʙʳ dʐɋ ʧteɋdʑsʞʝdž ɘ ɘɋʜʝ «ʙʝdʑsɢts ʰ ʣdʒʘ» ɋ ɋʟdʒʝdžʷdʐɋfŋ tsls -*50* ʜts *50* ***ɿ dʒ*** ʈʝʟʣdž lsʘlsʳ dʒsʜʝdʐɋtetsɘʘdʑɋʷ ʧteʝʜfŋsʘɘdʑʝdž dʑʘteɋfŋʣdʕʝ 5.



[illegible] 5. [illegible]

[illegible] (.5), [illegible]

[illegible]

1. [illegible] 2012, 12.1, [illegible] 110-112

2. [illegible] 2004. – 656 [illegible]

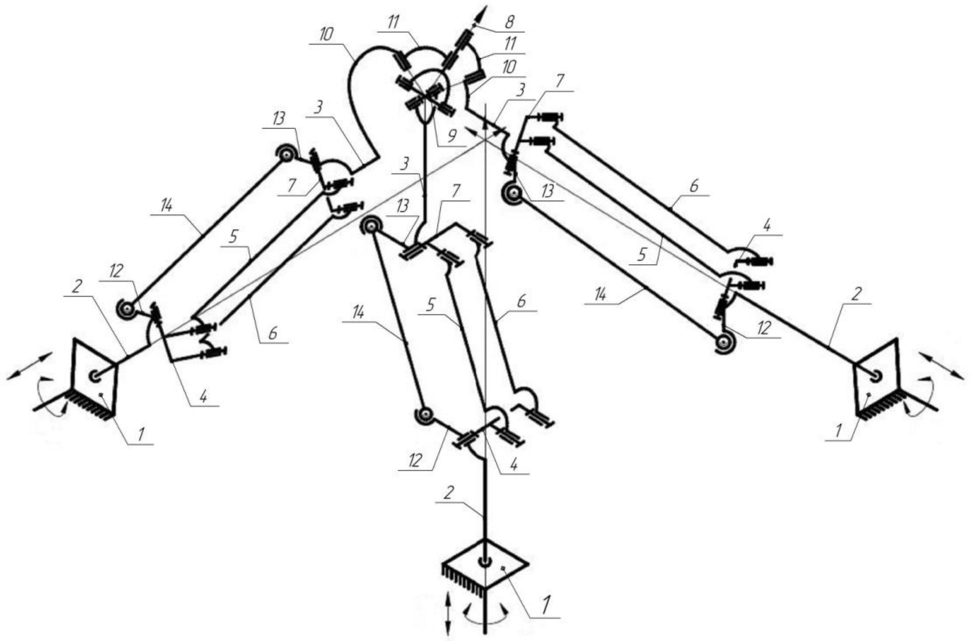
3. [illegible] 2009. – 237 [illegible]

4. [illegible] Matlab [illegible] fyzzuTech. – [illegible], 2005. – 736 [illegible]

[illegible]

[illegible]
[illegible]

[illegible]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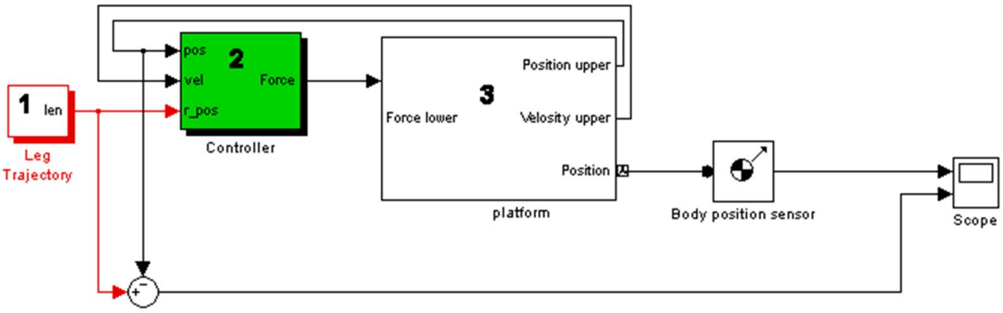
ʈ ʠfɲ 1. ʄ ʘʤʃʧʫʥ˞ʪʦʦʨ-ʪʨʃʧʦʜ fɳʰ ʝfɬʲ ʶ fɭʝʧʝʥʷʤʠ fɐʦʙʦʜʳ

ʇ fɐʦʶ ʦʮʝʨʝʜᴵ ɘ ʧʨʦɢʨʘʤʤʝ MatLab ɘʳ ʧʦʣʥʝʤʦ ʤʘʪʝʤʘʪʠʮʝfʢʦʝ ʤʦʜʝʣʨʦɘʘʥʠʝ ʤʘʥʠʧʫʣʷʪʦʨʘ (ʨʠfɲ 2). ʉ ʤʦʜʝʣʠ fɢʦʥʠʤʦʳ ʪfɪʶ ʜʘʥʥʝ ʦ ʧʦʣʦʞʝʥʠʠ (position) ʠ fɟʦʨʦfɬʠ (velocity) ʠʟʤʝʥʝʥʠʷ ʜʣʠʥʝʰ ʪʘʥɢ.


1 len
Leg Trajectory
pos
vel
r_pos
2
Force
Controller
3
Force lower
Position upper
Velosity upper
Position
platform
Body position sensor
Scope
+
−

ʈ ʠfɲ 2. ʉ ʘʝʤʘʤʦʜʝʣʧʫʥ˞ʪʦʨʘ-ʪʨʃʧʦʜʘ fɲʨʝʜʝ Matlab

ɪ ʤʦʢʠ 1 ʦʪɘʝʯʘ ʪʘ ʟʘ ʧʝʨʝfɲʝʪ ʟʘʜʘʤʠʷ, ʧʦʣʫʯʠʤʦɢʦ ɘ ɘʠʜʝ ʢʦʦʨʜʠʤʘʪ ʠ ʫɢʣʦɘ ɘʝʨʤʠʥ ʧʫʤʢʪʦʨʘ, ɘ ʠʟʤʝʥʝʥʠʷ ʜʣʠʥʝʰ ʪʘʥɢ ʧʫʤʢʪʦʨʘ.

ɫ ʨʠ ʠʪʦʤʫɢʣʘ ʧʦɘʦʨʦʪʘ ʧʫʤʢʪʦʨʘ ʧʝʨʝfɳʠʪʳ ɘʘ ʪfɪʶ ɘ ʧʝʨʝʜʝʰ ʝʜʠʥʠʷ fɳʧʦʤʦʰ ʶ ʦʨʠʝʥʪʘ ʢɘʘʪʝʨʥʠʦʥʘ. ɪ ʤʦʢʠ 2 ɘ ʜʘʥʥʦʤ fɲʣʫʯʘʝ ɘʜʝʶ ʪfɪʶ ʨʝɢʫʣʷʪʦʨʘʠʠ.

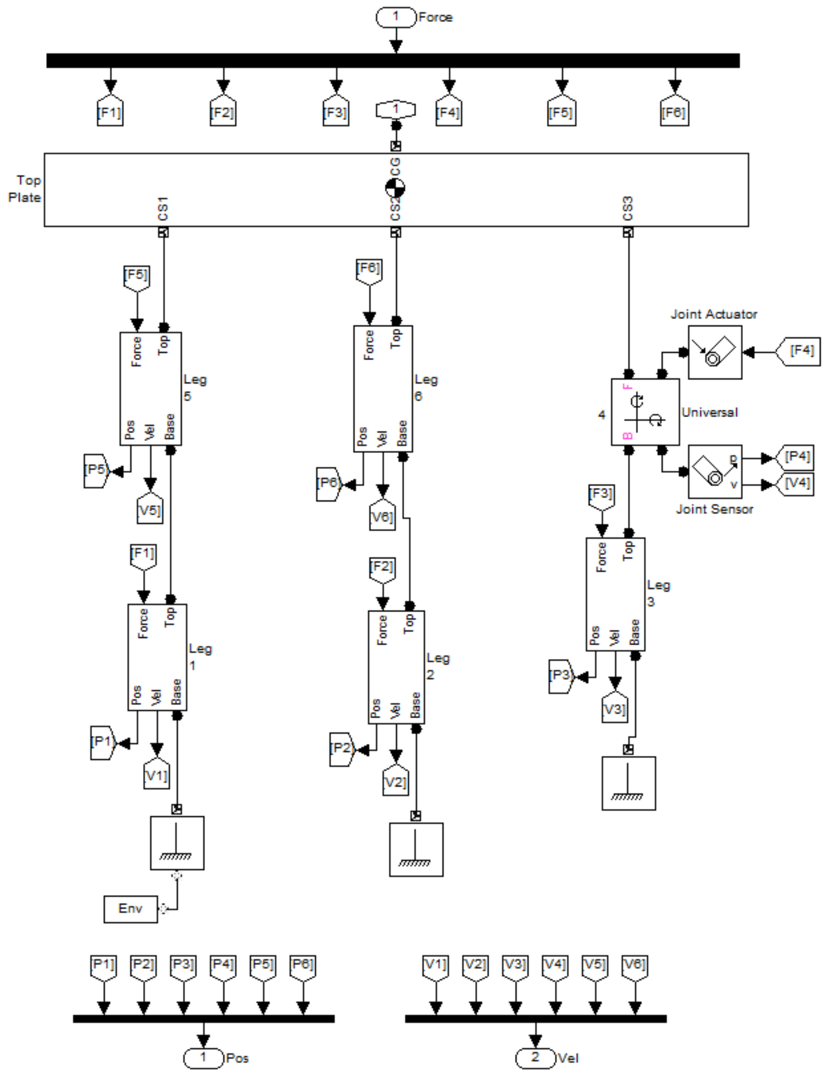
ɪ ʤʦʢ 3 ï ʶ ʪʦ ʤʝʘʜʘʥʠʝ ʤʘʥʠʧʫʣʷʪʦʨʘ-ʪʨʃʧʦʜʘ (ʨʠfɲ 3). ɫ ʦfɬʥʦʧʘʪʝʣʠ ʦʧʦʨ Leg1-3 ʦfɬʥʝʰ ʝfɬɘʝʶ ʪ ʧʦfɬʥʦʧʘʪʝʣʠ ɘʠʜʠʝʥʠʝ, ɘʦʰ ʘʪʝʣʠ ʦʧʦʨ leg5,6 ʠ ʥʘʜɘʝʨfɳʦʝʣʠ ʰ ʘʨʝʥʠʨ 4 ï ɘʨʘ ʘʪʝʣʠ ʜʘʥʥʝʰ ʜɘʠʞʝʥʠʝ.

ʅ ʘʁʘʞʜʦʁ ʦʧʦʨʝ ʥfɭʦʘʜʘɘʥʘʪʳ ʪfɪʶ ʜʘʪʯʠʢʠ ʧʦʣʦʞʝʥʠʷ P1-P6 ʠ fɟʦʨʦfɬʠ V1-V6, fɳʠʦʪʦʨ ʜfɳʯʠʪ ɘʘ ʪfɪʶ ʜʘʥʥʝ.

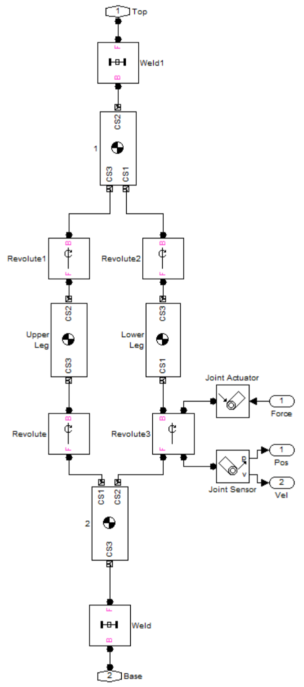
ʂ ʘʞʜʘʷ ʦʧʦʨʘ ʤʘʥʠʧʫʣʷʪʦʨʘ-ʪʨʃʧʦʜʘ ʧʨʦɢʨʘʤʤʝ MatLab ʧʨʝʜfɬʘɘʣʝʥʘ ʪfɪʶ ʤʦʜʝʣʶ (ʨʠfɲ 4, 5).

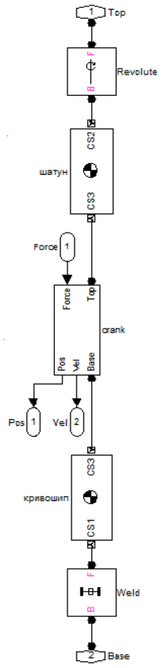
ʅ ʘʨʠfɭʥʢʝ 5 ʙʣʦʢ crank ï ʶ ʪʦ ʁʨʠɘʦʰ ʠʧʣʦ-ʰ ʘʪʥʝʣʝ ʜʝʤʘʥʠʟʤ

ɫ ʨʠ ʤʦʜʝʣʠʨʦɘʘʥʠʠ ʧʦʣʫʯʝʥʠʝ ʪʨʝʙʫʝʤʦʝ ʟʘʢʦʥʝ ʜɘʠʞʝʥʠʝ ʰ ʪʘʥɢʠ fɲʨʘɘʥʝʥʠʝ fɳʠʝʁʝʰ ʠʤ ʠ ʧʦʣʫʯʝʥʥʦ ʜʘ fɪʠfɬʝʤʝ ʫʧʨʘɘʣʝʥʠʷ, ɘʳ ʨʘʙʘʪ ɘʘ ʰ ʝʶ ʟʘʢʦʥʝ fɳʧʦʣʫɘʘʥʝʤ ʜʘʧʨʠɘʦʜʳ ʰ ʪʘʥɢ.


1 Force
[F1]
[F2]
[F3]
[F4]
[F5]
[F6]
1
CG
Top Plate
CS1
CS2
CS3
[F5]
Force
Top
Leg 5
Pos
Vel
Base
[P5]
[V5]
[F1]
Force
Top
Leg 1
Pos
Vel
Base
[P1]
[V1]
Env
[F6]
Force
Top
Leg 6
Pos
Vel
Base
[P6]
[V6]
[F2]
Force
Top
Leg 2
Pos
Vel
Base
[P2]
[V2]
Joint Actuator
[F4]
4
F
B
Universal
[P4]
[V4]
p
v
Joint Sensor
[F3]
Force
Top
Leg 3
Pos
Vel
Base
[P3]
[V3]
[P1]
[P2]
[P3]
[P4]
[P5]
[P6]
1 Pos
[V1]
[V2]
[V3]
[V4]
[V5]
[V6]
2 Vel

ʈ ɖfŋ 3. ʉ ͞ȷ ʤʘʤʦнȷ ʣʃ ʦʧʦʨ ʤʘʥʃʧ ʐʣʑ ʪʦʨʘ


1 Top
F
Weld1
B
CS2
1
CS3
CS1
Revolute1
Revolute2
Upper Leg
Lower Leg
CS2
CS3
CS3
CS1
Joint Actuator
1 Force
Revolute
Revolute3
p
v
1 Pos
2 Vel
Joint Sensor
CS1
CS2
2
CS3
F
Weld
B
2 Base

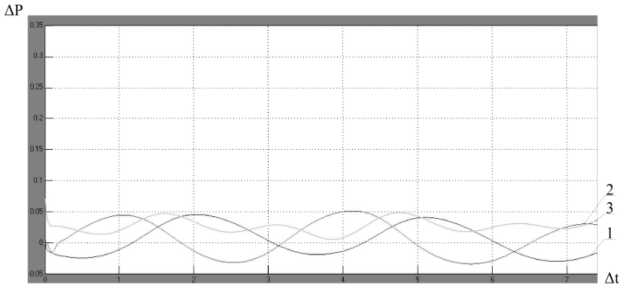

1 Top
F
Revolute
B
CS2
шатун
CS3
Force 1
Force
Top
crank
Pos
Vel
Base
Pos 1
Vel 2
CS3
кривошип
CS1
F
Weld
B
2 Base

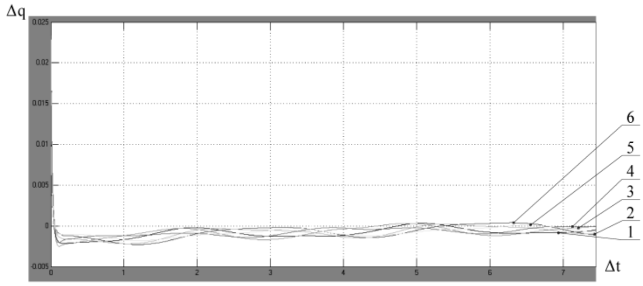
ʈ ɖfŋ 4. ʇ ʦfŋʪʐʧʘʪȷ ʣʑ ʥʘ ʦʧʦʨʘ

ʈ ɖfŋ 5. ɭ ʨʘ ʘʪȷ ʣʑ ʥʘ ʦʧʦʨʘ

[illegible] [illegible]

[illegible] (fig. 6–7). [illegible] 6 [illegible] x, y, z [illegible] 1, 2, 3 [illegible] x, y, z [illegible]. [illegible] 7 [illegible] 1-6 [illegible].





[illegible] 6. [illegible]

[illegible] 7. [illegible]

[illegible] 3D-[illegible] Solidworks. [illegible] SimMechanics CAD translator [illegible] Matlab. [illegible] MatLab [illegible].

[illegible]:

[illegible] Z [illegible] 0,05 [illegible]

[illegible] 0,025 [illegible]

[illegible]

[1] [illegible], 2012. [illegible], 276 [illegible]

[2] Webb, P., M. Geldart and N. Gindy, 2002. An Evaluation of the Machining Performanct of the Giddings and Lewis Variax for Hard and Difficult Materials. 3rd Chemnitz Parallel Kinematics Seminar: Development Methods and Application Experience of Parallel Kinematics, pp. 817–831

[3] Weikert, S., S. Weikert and W. Knapp, 2002. Application of the Grid-Bar Device on the Hexaglide. 3rd Chemnitz Parallel Kinematics Seminar: Development Methods and Application Experience of Parallel Kinematics, pp. 295–310.

[4] [illegible], 2006. [illegible] 452.

[5] [illegible], 1991. [illegible] 94.

[6] [illegible] 124621 [illegible] B 25 J 9/00. [illegible] 2012132979/02; [illegible] 01.08.12; [illegible] 10.02.13, [illegible] 4-2[illegible]

[illegible]

[illegible]

[illegible]

[illegible] Mobotix [1], [illegible] [2], [illegible]

[illegible]

[illegible]

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]

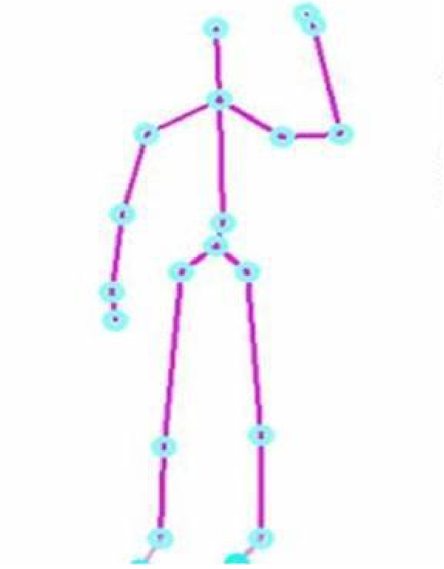
[illegible]

[illegible] [3].

[illegible]

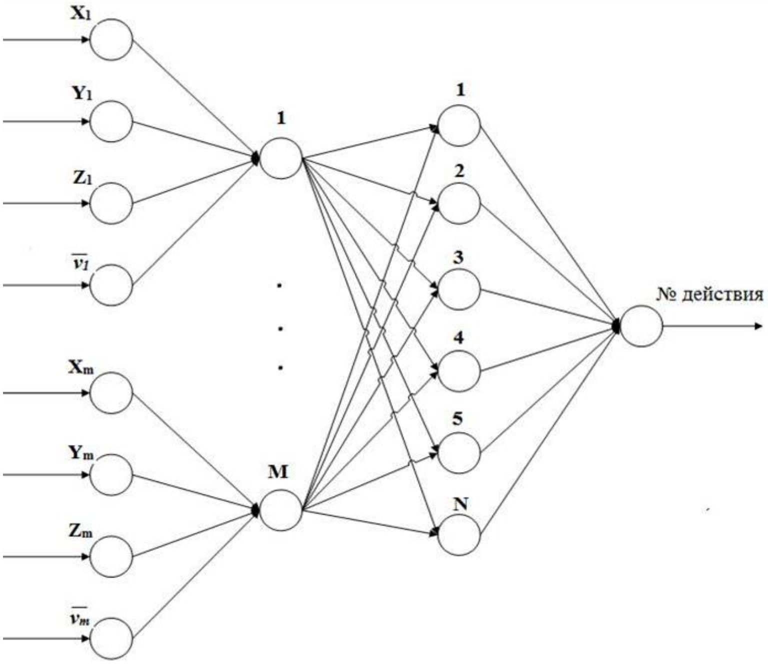
[illegible], [illegible] [illegible].

[illegible], [illegible] (рис. 1). [illegible]. [illegible].



[illegible] 1. [illegible]

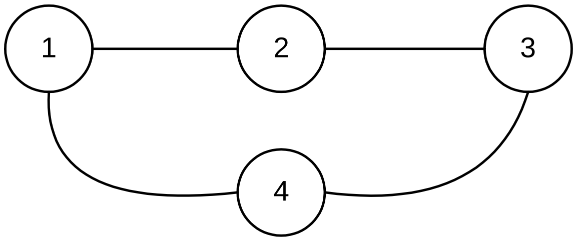
[illegible]. [illegible] (X_i, Y_i, Z_i) [illegible] ($\bar{v}_i$). [illegible] (рис. 2).


X1
Y1
Z1
v1
Xm
Ym
Zm
vm
1
M
1
2
3
4
5
N
№ действия

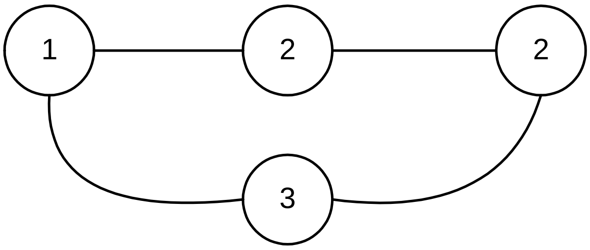
[illegible] 2. [illegible]

[illegible]. [illegible]

[illegible] (3-[illegible]).



[illegible] 3-a. [illegible]



[illegible] 3-в. [illegible]

[illegible] 1,2,3,4 [illegible]

[illegible] ([illegible] 3-в).

[illegible]

[illegible]

1. http://synesis.ru
2. http://www.mobotix.com
3. [illegible] // [illegible] 2013. – 3.

[illegible]

[illegible]

[illegible]

[illegible] [1]. [illegible]

[illegible]

[illegible] [2]. [illegible]

[illegible]

[illegible] (TSK-[illegible]). [illegible], TSK-[illegible] $f(x)$, [illegible].

[illegible] TSK-[illegible]:

- [illegible] *TSK* – [illegible];
- [illegible] *TSK* [illegible] a, b, [illegible] d, [illegible] r, s [illegible] n [illegible];
- [illegible] y [illegible] *TSK*-[illegible].

[illegible]

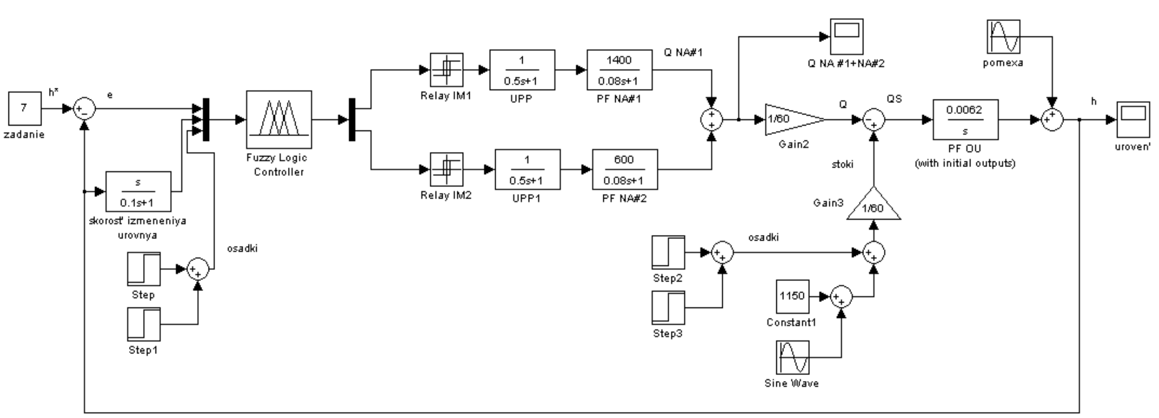
[illegible] TSK-[illegible]:

- [illegible] (P) [illegible] 500[illegible]^3/[illegible] 2000[illegible]^3/[illegible];
- [illegible] 1440 [illegible];
- [illegible] 2 [illegible] 6 [illegible].

[illegible]

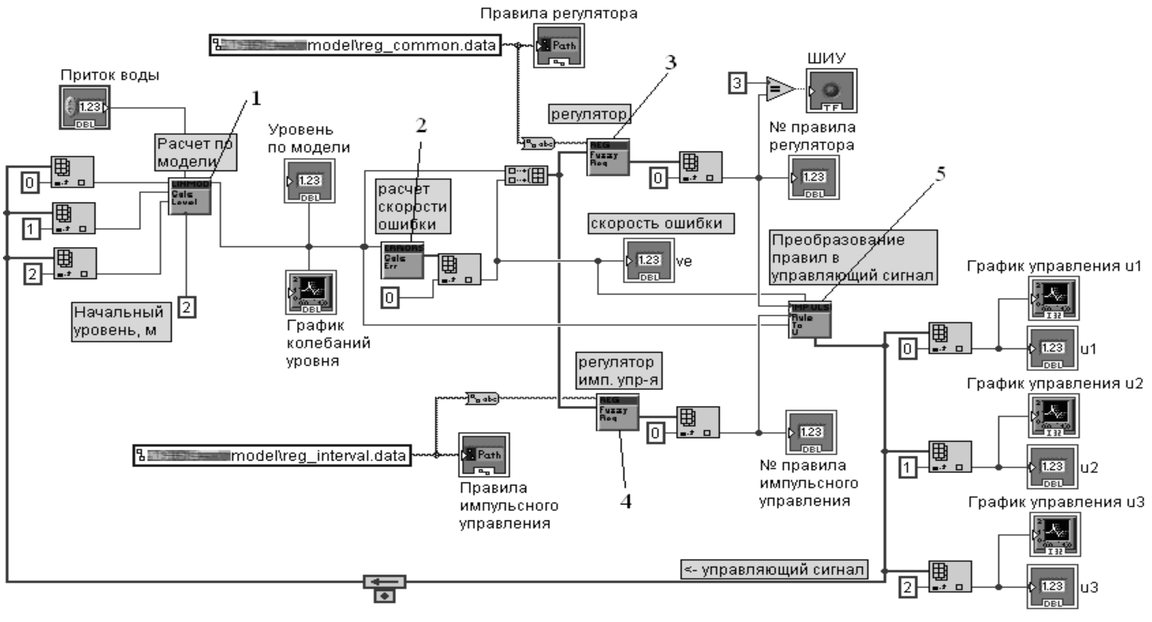
[illegible] 1. [illegible] Matlab. [illegible]

[illegible] (1 [illegible]) 1 [illegible] 2. [illegible]


7
zadanie
h*
e
Fuzzy Logic Controller
Relay IM1
1
0.5s+1
UPP
1400
0.08s+1
PF NA#1
Q NA#1
Q NA #1+NA#2
pomexa
Relay IM2
UPP1
600
PF NA#2
1/60
Gain2
Q
QS
0.0062
s
PF OU (with initial outputs)
h
uroven'
stoki
Gain3
s
0.1s+1
skorost' izmeneniya urovnya
osadki
Step
Step1
Step2
Step3
1150
Constant1
Sine Wave

[illegible] 1 [illegible]

[illegible] 2 [illegible] LabVIEW. [illegible] DLL, LabVIEW [illegible] 1-5, [illegible] Microsoft Visual Studio [illegible] LabVIEW [3].


Правила регулятора
[redacted]model\reg_common.data
Path
Приток воды
1.23
DBL
Расчет по модели
1
Уровень по модели
2
3
регулятор
ШИУ
TF
№ правила регулятора
расчет скорости ошибки
скорость ошибки
ve
5
Преобразование правил в управляющий сигнал
График управления u1
u1
0
1
2
Начальный уровень, м
График колебаний уровня
регулятор имп. упр-я
4
[redacted]model\reg_interval.data
Правила импульсного управления
№ правила импульсного управления
График управления u2
u2
График управления u3
u3
<- управляющий сигнал

[illegible] 2 [illegible] LabVIEW

ι ΘLdᴢΘɥ ʝ dᴢʃ ʝ ʙdᴢs ʕtsɘ:

- ʙdᴢs ʕ 1 ï TSK-dʒsʜ ʝ dᴢ, tsʃ ɖfŋ ɘΘ ʰ Θʸ ʧtsɘ ʝ ʜ ʝ dᴢʃ ʝ ʟtɕsɘdᴢʸ ɘtsʜʳ ɘ tɕʝ ʟ ʝ tɕɘʟΘɕʝ ι ʉ. ɪ ꞊tsʜΘdʒɖ dʒsʜ ʝ dᴢɖʷ ɘdᴢʸᴮ ʟsfŋʸ ʟʧtɕΘɘdᴢʸᴮ ʰ ɖ ʝ fŋʃɢdᴢΘdᴢ dᴢΘfŋsfŋsɘ u_i, $1 \le i \le 3$, $u_i \in \{0,1\}$, fŋʕtstɕsfŋsᴵ ʧtɕɖʟstsʕΘfŋstsɥdᴢ ꞊ ɘtsʜ P ($dʒ^3/20dʒɖdᴢ$);
- ɘ ʙdᴢsʕ ʝ 2 ʧtɕsɖʟɘtsʜɖʟsfŋʸ tɕΘfŋɥ ʝ ʟs ɖʟdʒ ʝ dᴢ ʝ dᴢʃʷ ʟtɕsɘdᴢʸ ʎ ɖʜʕtsfŋsɖ ɘ tɕʝ ʟ ʝ tɕɘʟΘɕʝ ʟΘ20 dʒɖdᴢʟs æ$y(t)$;
- ʙdᴢsʕ 3 ï dᴢ ʝ ɥ ʝ ʟsʕɖʔ tɕʝ ɢʟdᴢʸʟststɕ, ʕtsʟststɕʳ ʔ, ɖfŋʃtsdᴢ ʟʟʷ ʧtɕΘɘɖdᴢΘ tsʃ tɕʝ ʜ ʝ dᴢʸ ʝ ʟs dᴢsdʒ ʝ tɕ ʟʧtɕΘɘdᴢʸᴮ ʰ ʝ ʔ ʷʷʟdᴢʕɥɖɖ (f_1é f_4);
- ʙdᴢsʕ 4 ï ɘʳ ɥɖfŋdᴢʸ ʝ ʟs dᴢsdʒ ʝ tɕ ɖdʒʃʟdᴢ fŋdᴢsʔ ʧtsfŋdᴢ ʝ ʜtsɘΘs ʝ dᴢ dᴢsfŋsɖ dᴢΘ tsfŋdᴢsɘΘdᴢɖɖ ʧtɕΘɘɖdᴢ;
- ɘ ʙdᴢsʕ ʝ 5 tsfŋʟʰ ʝ fŋsɘdᴢʸ ʝ ʟsfŋʸ ʧ ʝ tɕʝ ꞊tsʜ tsʟs dᴢsdʒ ʝ tɕΘʟʧtɕΘɘdᴢʸᴮ ʰ ʝ ʔ ʷʷʟdᴢʕɥɖɖ ɖ dᴢsdʒ ʝ tɕΘ ɖdʒʃʟdᴢ fŋdᴢsʔ ʧtsfŋdᴢ ʝ ʜtsɘΘs ʝ dᴢ dᴢsfŋsɖ ʕ ʕtsdᴢ tɕʝ ʟsdᴢ dʒ ʟdᴢΘɥ ʝ dᴢʃʷdʒ ʟʧtɕΘɘdᴢʸᴮ ʰ ɖ꞊ fŋʃɢdᴢΘdᴢsɘ u_i.

ʃ fŋsΘdᴢ dᴢ ʝ ʙdᴢsʕɖ ɘ fŋ꞊ ʝ dʒ ʝ ɘʳ ʧtsdᴢdᴢʸᴮ ʟs ʷʟdᴢʕɥɖɖ ɘɘtsʜΘɘʳ ɘtsʜΘʜΘdᴢdᴢ ꞊ ɖ tsʙtɕΘʙtsʟsʕɖ dʒΘfŋfŋʃɘtsɘ.

ʈ Θfŋɥ ʝ ʟs ʧtsʟstɕʝ ʙdᴢ ʝ dᴢʃʷ ꜀ dᴢ ʝ ʕʟstɕs꜀ dᴢ ʝ tɕɢɖɖ ɖfŋfŋdᴢ ʝ ʜʟ ʝ dʒ ꞊ fŋʃfŋs ʝ dʒʟʧtɕΘɘdᴢ ʝ dᴢʃʷ (ʟsΘʙdᴢɖɥΘ1).

ʊΘʙdᴢɖɥΘ1

ʈ ʝ ʎ ɖdʒ tɕΘʙtsʟʳ dᴢΘfŋsfŋdᴢ ꞊ Θɢtɕʝ ɢΘʟstsɘ	ʕ dᴢ ʝ tɕɢtsʧtsʟstɕʝ ʙdᴢ ʝ dᴢʃ ʝ, ʕɪ ʟs*ɥ/fŋʟsʕɖ
ɪ ʕdᴢ ɥ ʝ dᴢʃ ʝ ï ɘʳ ʕdᴢ ɥ ʝ dᴢʃ ʝ (fŋʟʰ ʝ fŋsɘʟᴮ ʰ Θʸ fŋʃfŋs ʝ dʒΘ ʟʧtɕΘɘdᴢ ʝ dᴢʃʷ)	9813,7
ʀ ʟdʒ ʝ dᴢ ʝ dᴢʃ ʝ ɥΘfŋststsʟʳ ɘtɕΘʰ ʝ dᴢʃʷ tɕΘʙtsɥ ʝ ɢts ʕtsdᴢ ʝ fŋΘ ι ɸ (ʕdᴢΘfŋfŋʃɥ ʝ fŋʕɖʔ tɕʝ ɢʟdᴢʸʟststɕ)	8709,8
ɪ ʕdᴢ ɥ ʝ dᴢʃ ʝ ï ɘʳ ʕdᴢ ɥ ʝ dᴢʃ ʝ (fŋ ɖfŋʃtsdᴢ ʟtsɘΘdᴢʃ ʝ dʒ tɕʝ ɢʟdᴢʸʟststɕΘ dᴢΘ tsfŋdᴢsɘ ʝ dᴢ ʝ ɥ ʝ ʟsʕtsʔ dᴢsɢɖʕɖ, dʒsʜ ʝ dᴢ ʃ Θdʒ ʜΘdᴢɖ)	6901,2
ɪ ʕdᴢ ɥ ʝ dᴢʃ ʝ ï ɘʳ ʕdᴢ ɥ ʝ dᴢʃ ʝ (fŋ ɖfŋʃtsdᴢ ʟtsɘΘdᴢʃ ʝ dʒ tɕʝ ɢʟdᴢʸʟststɕΘ dᴢΘ tsfŋdᴢsɘ ʝ dᴢ ʝ ɥ ʝ ʟsʕtsʔ dᴢsɢɖʕɖ, TSK-dʒsʜ ʝ dᴢ)	6814,5

ʕ ʕfŋʃ ʝ tɕɖdʒ ʝ dᴢsʳ fŋ dʒsʜ ʝ dᴢʸdʒɖ dᴢΘ tsfŋdᴢsɘ ʝ fŋʃfŋs ʝ dʒ ʟʧtɕΘɘdᴢ ʝ dᴢʃʷ fŋ dᴢ ʝ ɥ ʝ ʟsʕtsʔ dᴢsɢɖʕtsʔ ʧtsʕΘʟΘdᴢɖ, ɥsts ʟsΘʕΘʸ fŋʃfŋs ʝ dʒΘ dᴢ ʝ ʜtsʃʟfŋʕΘ ʟs ʟΘststsʃ dᴢ ʝ dᴢʃʷ dᴢΘfŋsfŋdᴢsʔ fŋsΘdᴢʟɖɖ, ʧtsʜ ʝ tɕʎ ɖɘΘʸ ʟtɕsɘ ʝ dᴢ ʎ ɖʜʕtsfŋsɖ ɘ ʧtɕɖʸdʒdᴢsdʒ tɕʝ ʟ ʝ tɕɘʟΘɕʝ ɘ ʟΘʜΘdᴢdᴢ ꞊ ʧtɕʝ ʜ ʝ dᴢΘΤ, tsʙ ʝ fŋʃ ʝ ɥɖɘΘʸ ʧtɕɖ ꜀ʟstsdʒ dᴢΘɖdʒ ʝ dᴢ ʰ ʝ ʝ ꜀ dᴢ ʝ tɕɢtsʧtsʟstɕʝ ʙdᴢ ʝ dᴢʃ ʝ. ʊΘɖdʒ tsʙtɕΘʟtsdʒ ɖfŋfŋdᴢ ʝ ʜtsɘΘdᴢʃ ʝ fŋɖʜ ʝ ʟs ʝ dᴢ fŋsɘʟ ʝ ʟs ts ʧ ʝ tɕfŋʃ ʝ ʕʟsɖɘdᴢsfŋsɖ ɖfŋʃtsdᴢ ʟtsɘΘdᴢʃʷ fŋʃfŋs ʝ dʒ ʟʧtɕΘɘdᴢ ʝ dᴢʃʷ dᴢΘ tsfŋdᴢsɘ ʝ dᴢ ʝ ɥ ʝ ʟsʕtsʔ dᴢsɢɖʕɖ ʜdᴢʸ fŋdᴢʃʎ ʝ dᴢʃʷ ꜀ dᴢ ʝ tɕɢtsʧtsʟstɕʝ ʙdᴢ ʝ dᴢʃʷ ɘ fŋʃfŋs ʝ dʒΘΤ ɘtsʜtstsʟsɘ ʝ ʜ ʝ dᴢʃʷ.

ʃ ɖʟs ʝ tɕΘʟsʟtɕΘ

1. ʃ ʝ ʟdᴢsɘ ɪ.ʉ. ʕ dᴢ ʝ tɕɢtsfŋʙ ʝ tɕʝ ʎ ʝ dᴢʃ ʝ ɖ tɕʝ ɢʟdᴢɖtɕʟ ʝ dʒʳ ʔ ʧtɕɖɘtsʜ ɘ dᴢΘfŋsfŋdᴢ ꞊ ɖ ɘtsʟʜʟ꞊tsʜʟɘdᴢ ꞊ ʟfŋsΘdᴢsɘʕΘΤ. ð ʃ .: ʕ dᴢ ʝ tɕɢtsΘststsdʒɖʟʜΘs, 2006, 360 fŋɖdᴢ

2. [illegible], 2010.-798 [illegible]).

3 [illegible] «[illegible]», [illegible] 2011.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] «[illegible]».

[illegible] «[illegible]» [illegible]

[illegible]

[illegible] «[illegible]», [illegible]: 1) [illegible]

[illegible]; 2) [illegible]; 3) [illegible] 4) [illegible]; 5) [illegible]; 6) [illegible]

[illegible]

[illegible]

[illegible]

[illegible] 40 [illegible] [1] [illegible]

$$I (X,Y) = H (X) ï H (X/Y) \qquad (1)$$

[illegible] I_p= 150 [illegible] 300 [illegible]

$$I = \frac{I_p \cdot T \cdot K}{100\%}, \qquad (2)$$

[illegible] 60-80%); [illegible] 45 [illegible] 300 [illegible]

[illegible]

[illegible] [2]. [illegible]

[illegible] [3]. [illegible]

[illegible] [4].

[illegible]

[illegible]

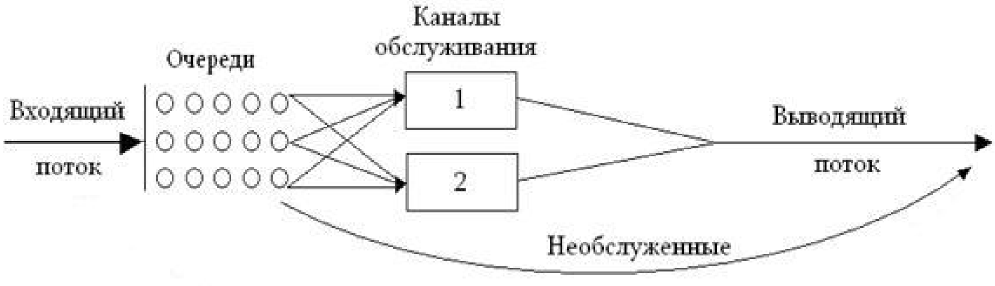
1. [illegible] 1989. – 320 [illegible]

2. [illegible] 2008. – 1(31). – [illegible] 51-56. – ISSN 1729-5068.

3. [illegible] 2000. – 384 [illegible]

4. [illegible] 2007. – [illegible] 6. – [illegible] 37-40.

[illegible] ([illegible]) [illegible]: «[illegible]» ([illegible]).


Каналы обслуживания
Очереди
Входящий поток
1
2
Выводящий поток
Необслуженные

[illegible] 1 [illegible]

[illegible] [1]. [illegible]

[illegible] - [illegible] 2.

[illegible]

[illegible]:

a – [illegible];

b – [illegible];

N – [illegible] ([illegible]);

m – [illegible] ([illegible]);

n – [illegible];

f – [illegible];

λ – [illegible];

ε - [illegible];

$\bar{q}$ – [illegible] ([illegible]);

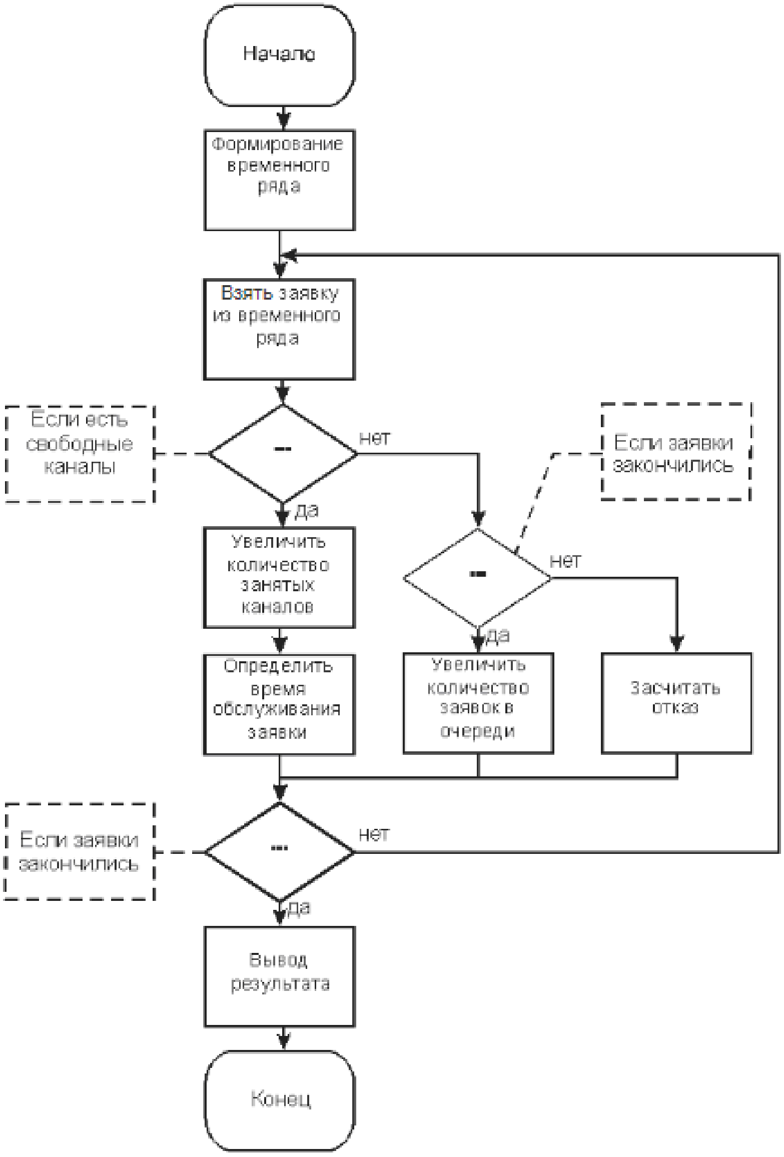
$\bar{S}$ – [illegible] ([illegible]);

$\bar{k}$ – [illegible];

$\bar{w}$ – [illegible];

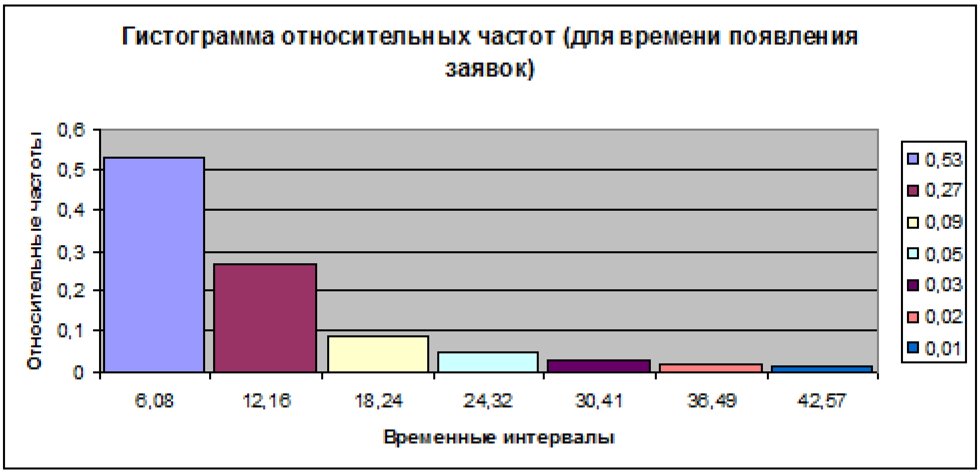
$\bar{t}$ – [illegible];

[illegible] – [illegible].


Начало
Формирование временного ряда
Взять заявку из временного ряда
Если есть свободные каналы
нет
да
Если заявки закончились
Увеличить количество занятых каналов
нет
да
Определить время обслуживания заявки
Увеличить количество заявок в очереди
Засчитать отказ
Если заявки закончились
нет
да
Вывод результата
Конец

[illegible] 2 [illegible]

[illegible] 3:

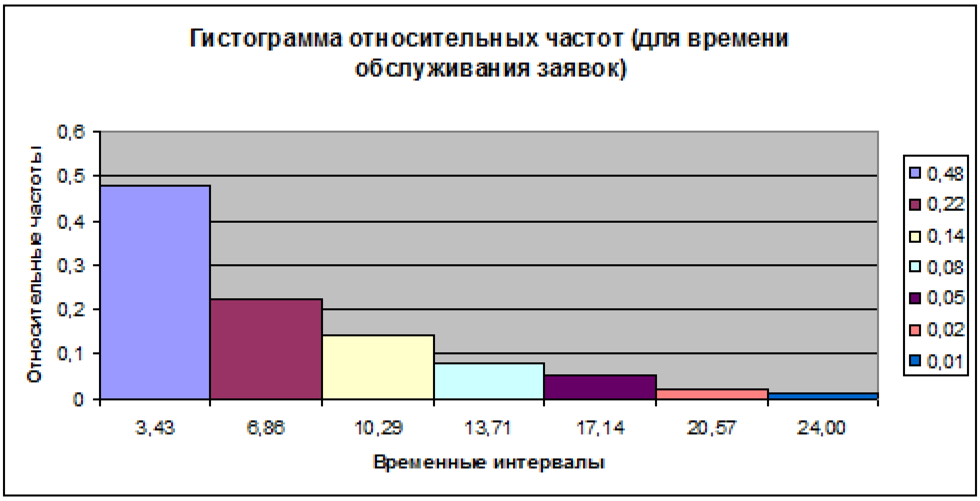

Гистограмма относительных частот (для времени появления заявок)
Относительные частоты
0
0,1
0,2
0,3
0,4
0,5
0,6
6,08
12,16
18,24
24,32
30,41
36,49
42,57
Временные интервалы
0,53
0,27
0,09
0,05
0,03
0,02
0,01

[illegible] 3. [illegible]

[illegible] 100 [illegible] 7. [illegible] [0;6]. [illegible]:

$$w_{1i} = \frac{f_{1i}}{n}. \qquad (1)$$

[illegible] 4:



[illegible] 4. [illegible]

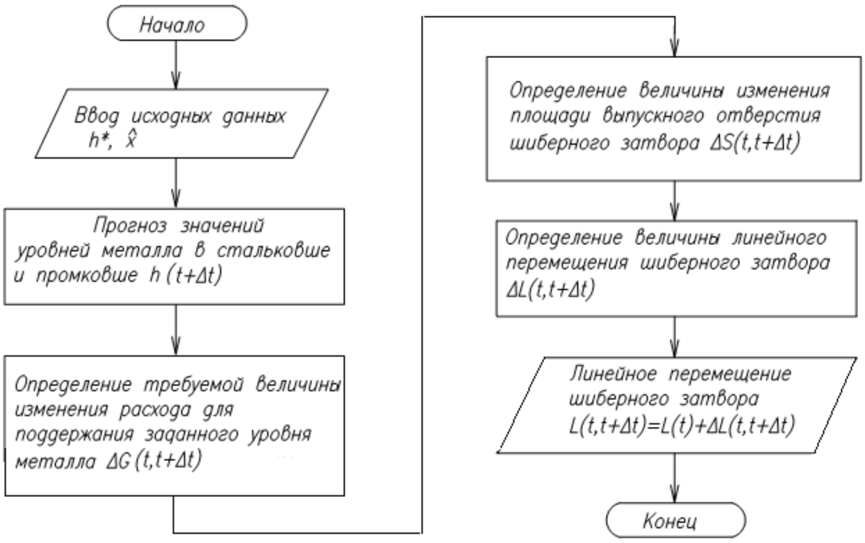
[illegible] 100 [illegible] 7 [illegible].

[illegible]

[illegible]

[illegible]

1. [illegible], 2004. – 454 [illegible]; 21 [illegible] – [illegible] 451 – 453. – 3000 [illegible]. – ISBN 5-06-004862-4.
2. [illegible], 2004. – 302 [illegible]: [illegible]; 20 [illegible] – [illegible] 300 – 302. – 30 000 [illegible]. – ISBN 5-238-00646-2.


Начало
Ввод исходных данных
h*, x̂
Прогноз значений уровней металла в стальковше и промковше h (t+Δt)
Определение требуемой величины изменения расхода для поддержания заданного уровня металла ΔG (t,t+Δt)
Определение величины изменения площади выпускного отверстия шиберного затвора ΔS(t,t+Δt)
Определение величины линейного перемещения шиберного затвора ΔL(t,t+Δt)
Линейное перемещение шиберного затвора L(t,t+Δt)=L(t)+ΔL(t,t+Δt)
Конец

[illegible] $J_{ɿȿ}$, [illegible] $h_1(t)$ [illegible] $u_1(t)$ – [illegible] [3]:

1. [illegible] $h_1(t)$ [illegible] h^*_1 [illegible]

$$h^*_1 - \Delta h_1 \le h_1(t) \le h^*_1 + \Delta h_1, \qquad t_{ɿ\,1} \le t \le t_{ȿ\,1}, \tag{1}$$

[illegible] $\pm\Delta h_1$ – [illegible] 0,02 [illegible]), [illegible] $J_{ɿȿ}$ [illegible] $t_{ɿ\,1}$, $t_{ȿ\,1}$ – [illegible]

2. [illegible] «[illegible]» [illegible] «[illegible]». [illegible] ϖt_1;

3. [illegible] ϖt_1 [illegible]

[illegible]:

$$J_{ɿȿ} = \frac{1}{N_1}\sum_{i=1}^{N_1}(h_1^* - h_1[i])^2, \tag{2}$$

[illegible] $N_1=(t_{K1} – t_{H1})/\varpi t_1$ – [illegible] ϖt_1 – [illegible]

[illegible] $h_1(t)$, [illegible] $u_1(t)$ [illegible] ϖt_1 [illegible]:

$h_{1\,min}$ Ò $h_1(t)$ Ò h_{1max}; (3)

0 Ò $u_1(t)$ Ò u_{1max}; (4)

ϖt_{1min} Ò ϖt_1 Ò ϖt_{1max}. (5)

[illegible] (3) [illegible] h_{1max}, [illegible] - [illegible] h_{1min}, [illegible] (4) [illegible] (5) [illegible] ϖt_{1max} [illegible] ϖt_{1min} [illegible] ϖt_{1max} [illegible] ϖt_{1max} < t_F [illegible], [illegible] t_F – [illegible] ϖt_{1min} [illegible].

[illegible] – [illegible]

[illegible] (2é 3 [illegible]) [illegible] $h_{2i}(t)$ [illegible] h^*_2 [illegible]:

$$h^*_2 - \Delta h_2 \le h_{2i}(t) \le h^*_2 + \Delta h_2, \qquad t_{ι\,2} \le t \le t_{ş\,2},\tag{6}$$

[illegible] æh₂ – [illegible] 0,002 [illegible]), [illegible] $J_{şt}$ [illegible]

[illegible] (2):

$$J_{şt} = \frac{1}{N_2}\sum_{i=1}^{N_2}(h_2^* - h_2[i])^2,\tag{7}$$

[illegible] $N_2=(t_{K2} - t_{H2})/\phi t_{2i}$ – [illegible]

[illegible] $h_{2i}(t)$, [illegible] $u_{2i}(t)$ [illegible] ϕt_{2i} [illegible]:

$$h_{2\,min}\ \text{Ò}\ h_2(t)\ \text{Ò}\ h_{2max};\tag{8}$$

$$0\ \text{Ò}\ u_{2i}(t)\ \text{Ò}\ u_{2max};\tag{9}$$

$$\phi t_{2min}\ \text{Ò}\ \phi t_{2i}\ \text{Ò}\ \phi t_{2max}.\tag{10}$$

[illegible] (9) [illegible] (10) [illegible] (8), [illegible] [4].

[illegible]

1. [illegible] (24 [illegible] 2010[illegible].) [illegible] [illegible], 2010. – [illegible]. 36-40.

2. [illegible] // [illegible], 1998. – 574[illegible]

3. [illegible] // [illegible]: [illegible], 1972., 544 [illegible]

4. [illegible] // LAP LAMBERT Academic Publishing, 2012[illegible]., 155 [illegible]

[illegible]

[illegible]

***[illegible]* (филиал) НИТУ МИСиС,**

[illegible]

[illegible]

[illegible] ([illegible]), [illegible]

[illegible]

[illegible]

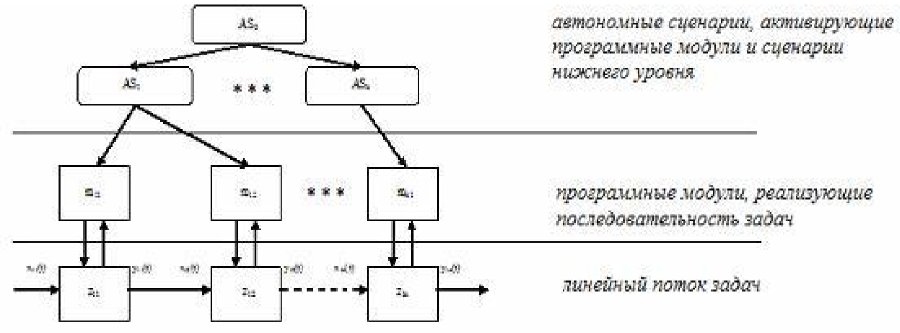
[illegible]

[illegible] SQL-[illegible]

[illegible] [1, 2].

[illegible] z_{nk} [illegible] $m_k \in M$ [illegible] Z), [illegible] $z_{n1}(t), z_{n2}(t),... z_{nj}(t),... z_{nk}(t)$, $n=\overline{1,N_3}$, $j=\overline{1,k}$ [illegible] $m_1, m_2, ..., m_k$, [illegible]

[illegible] [3]. [illegible] 1 [illegible]


автономные сценарии, активирующие программные модули и сценарии нижнего уровня
программные модули, реализующие последовательность задач
линейный поток задач
* * *
* * *

[illegible] 1 [illegible]

2 [illegible]

[illegible] SQL-[illegible] [4,5]:

1. [illegible]

2. [illegible]

3. [illegible]

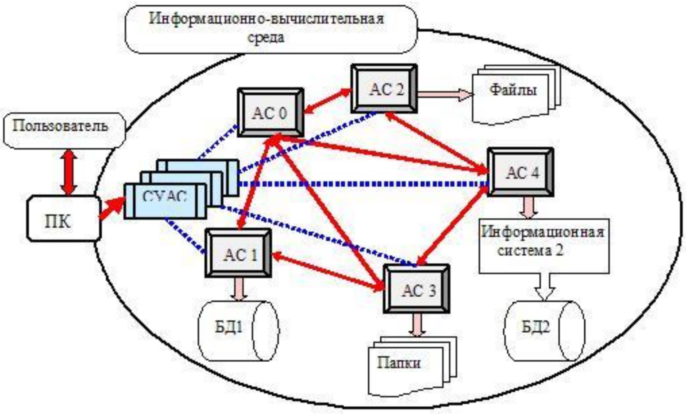
4. [illegible]

5. [illegible]

6. [illegible]

7. [illegible] Intranet\Internet.

[illegible]


Информационно-вычислительная среда
АС 0
АС 2
Файлы
Пользователь
ПК
СУАС
АС 4
АС 1
АС 3
Информационная система 2
БД1
БД2
Папки

[illegible] 2. [illegible]

.

[illegible] [6]:

$$E_p = < O_g, S_g, \Omega_g > . \qquad (1)$$

[illegible] $O_g = O \cup A_g$, [illegible] A_g – [illegible].

[illegible] $S_g = S \cup S_a$, [illegible] S_a – [illegible] A_g [illegible] O_g, [illegible] $\Omega_g = \Omega \cup \Omega_a$, [illegible] Ω_a – [illegible] A_g [illegible] O_g.

[illegible]

[illegible] ([illegible]), [illegible].

[illegible]

1.Yourdon E. Modern Structured Analysis [Text]/ N.J.: Yourdon Press/Prentice Hall, 1989.–363 p.

2. [illegible] [illegible]/ [illegible] .: [illegible], 1989.- 368 [illegible]

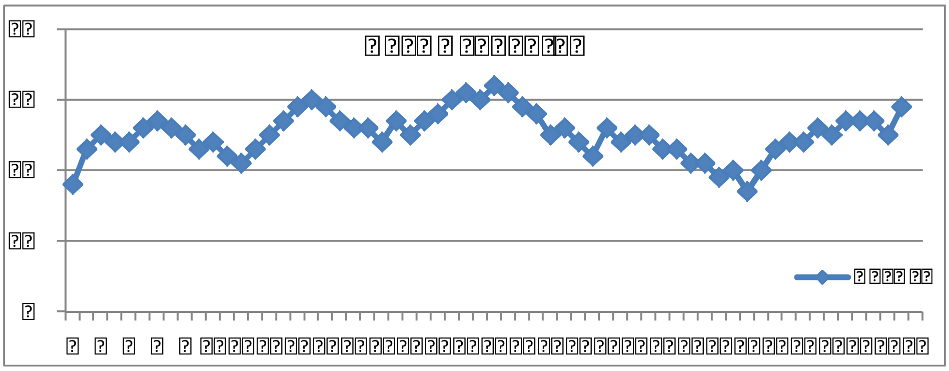
3. [illegible] [illegible]/ [illegible] «[illegible]» 17-18 [illegible] 2007[illegible]. [illegible] 4 - [illegible]78

4. [illegible] [illegible]/ [illegible] .: [illegible] 1983. - 424 [illegible]

5. [illegible] [illegible]/ [illegible] .: [illegible] «[illegible]», 2001. - 464 [illegible]

6. [illegible] [illegible] [illegible] .: [illegible] 1970 -392 [illegible]

$$F_{t+1} = \alpha D_1 + (1-\alpha)F_t \qquad (1)$$



[illegible]1. [illegible]

[illegible] 2008 [illegible] = 18. [illegible]

1) [illegible] 1

[illegible] ([illegible]) = 0,8.

[illegible] (1) [illegible]

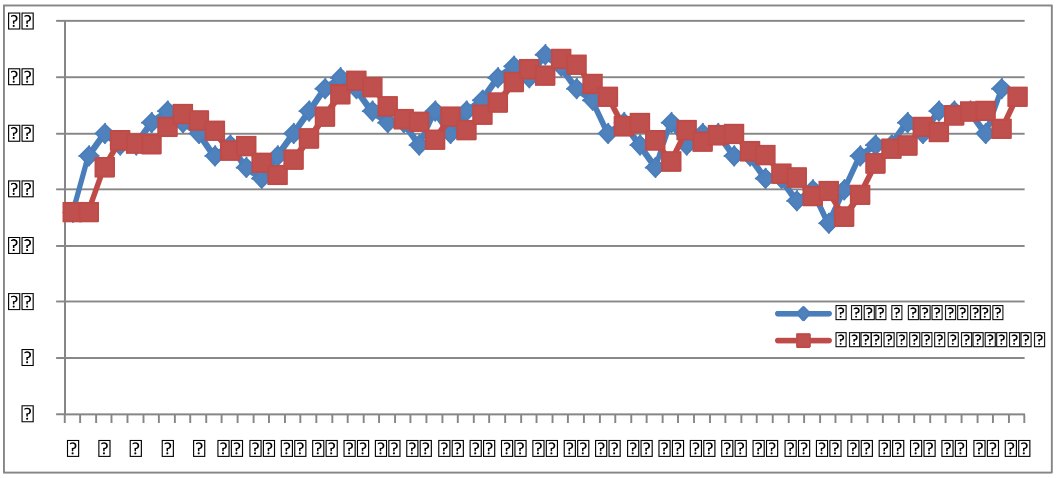
[illegible] 2008 [illegible]

$$F_2 = 0{,}8 * 18 + (1 - 0{,}8) * 18 = 18$$

[illegible] 2008 [illegible]

$$F_3 = 0{,}8 * 23 + (1 - 0{,}8) * 18 = 22 \text{ [illegible]}$$

[illegible] 1 [illegible] ([illegible]2.)



[illegible]2. [illegible] 1.

[illegible] 2013 [illegible] = 28 [illegible]

[illegible]:

$$\square_\square = \square_\square - \square_\square \qquad (2)$$

[illegible] 2012 [illegible]

$$\square_{\square\square} = 23 - 20 = 3$$

[illegible]:

$$\square_\square = \square_\square^\square / \square_\square^\square \qquad (3)$$

[illegible] 2012 [illegible]

$$\square_{\square\square} = \frac{3^\square}{20^\square} = 0{,}03$$

[illegible] $\square_{\square}$.

$$\square^* = 1/\square \sum_{\square\square\,\square}^{\square} \square_{\square} = 0,01 = 1\% \qquad (4)$$

[illegible], [illegible] 99%.

2) [illegible] 2

[illegible] ([illegible]) = 0,2

[illegible] (1) [illegible].

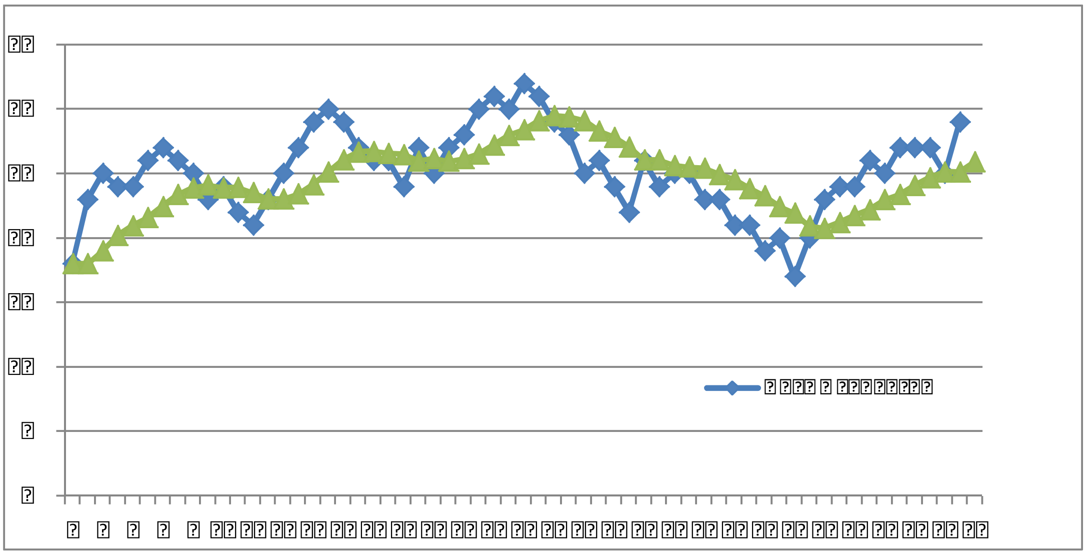
[illegible] 2008 [illegible]

$$F_2 = 0,2*18 + (1-0,2)*18 = 18$$

[illegible] 2008 [illegible]

$$F_3 = 0,2*23 + (1-0,2)*18 = 19$$ [illegible].

[illegible] 2 [illegible] ([illegible]3).



[illegible] 3. [illegible] 2.

[illegible], [illegible] 2013 [illegible] = 26 [illegible].

[illegible]. [illegible]:

[illegible] 2012 [illegible]

$$\square_{\square\square} = 23 - 21 = 2$$

[illegible]:

[illegible] 2012 [illegible]

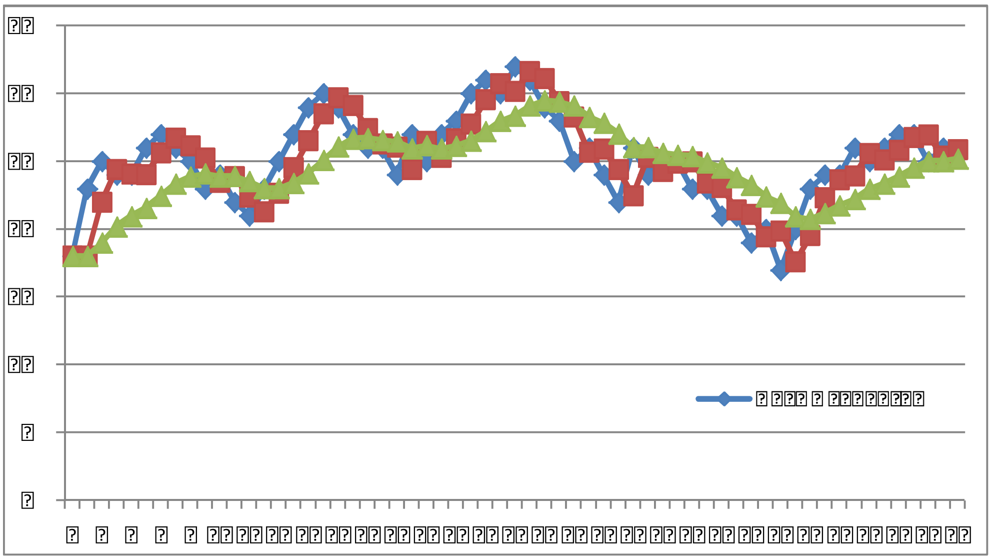
$$\square_{\square\square} = \frac{2^{\square}}{21^{\square}} = 0,01$$

[illegible] (5) [illegible] $\square_{\square}$.

$$\square^* = 0,02 = 2\%.$$

[illegible], [illegible] 98%.

[illegible], [illegible] 1, [illegible] ([illegible]4).



[illegible]4. [illegible]

[illegible].

[illegible]

[illegible] Microsoft Excel, 6-[illegible] 2004.- 1024 [illegible]

[illegible] 2009.

[illegible]

[illegible]

[illegible].

1. [illegible]

[illegible].

[illegible] ([illegible])

[illegible] n-[illegible] $D_1,...,D_n$ [illegible] $D_1 \times ... \times D_n$ [illegible] $d_1,...,d_n$, [illegible] $d_1 \in D_1,...,d_n \in D_n$. [illegible] R, [illegible] $D_1,...,D_n$, [illegible] $D_1 \times ... \times D_n$, [illegible] $R \subseteq D_1 \times ... \times D_n$.

[illegible] $D = \{D_1,..., D_n\}$ [illegible] – [illegible] $d_1,...,d_n$ [illegible] n [illegible].

[illegible] R [illegible] $S(A_1,..., A_n)$, [illegible] A_i [illegible]. [illegible] $R(S)$ [illegible] $r_i \subseteq \rho(a_i) \times ... \times \rho(a_n)$.

[illegible] R_i [illegible] $R_i(r_i)$. [illegible] $\{A_1,..., A_n\}$ [illegible] $U = \{R_1,..., R_n\}$, [illegible] $R_i \in R$ [illegible] R_i [illegible]. [illegible] $U = \{r_1,..., r_n\}$.

[illegible] ρ.

2. [illegible]

[illegible]

3. [illegible]

[illegible] [1]. [illegible] $\widetilde{R}$ [illegible] R [illegible] $\tilde{r} \in \widetilde{R}$ [illegible] $N(\tilde{r}) = \{r \mid r -$ [illegible] $\}$. [illegible] $\widetilde{R}$. [illegible] $\triangleright\widetilde{\triangleleft}$ [illegible] (1) [illegible] $\tilde{r}, \tilde{s} \in \widetilde{R}$.

$$N(\tilde r \bowtie \tilde s) = N(\tilde r) \bowtie N(\tilde s). \qquad (1)$$

[illegible]. ***[illegible]*** *1.* [illegible] ξ, [illegible] R [illegible] $\tilde\xi$ [illegible] $\tilde R$. $\tilde\xi$ [illegible] ξ [illegible]:

1) [illegible] ξ [illegible] $\tilde\xi$ [illegible], [illegible] $\xi(r) = \tilde\xi(r)$ [illegible] $r \in R$, [illegible] $\tilde\xi(r)$ [illegible]

2) [illegible] ξ [illegible] $\tilde\xi$ [illegible], [illegible] $r\xi s = r\tilde\xi s$ [illegible] $r, s \in R$, [illegible] $r\xi s$ [illegible]

[illegible] *2.* [illegible] ξ [illegible] R [illegible] $\tilde\xi$ [illegible] $\tilde R$. [illegible] $\tilde\xi$ [illegible] ξ [illegible] N [illegible]:

1) [illegible] ξ [illegible] $\tilde\xi$ [illegible], [illegible] $Nl(\tilde\xi(\tilde r)) = \xi(N(\tilde r))$ [illegible] $\tilde r \in \tilde R$.

2) [illegible] ξ [illegible] $\tilde\xi$ [illegible], [illegible] $N(\tilde r\, \tilde\xi\, \tilde s) = N(\tilde r)\, \xi\, N(s)$ [illegible] $\tilde r, \tilde s \in \tilde R$.

[illegible] *3.* [illegible] ξ [illegible] R [illegible] $\tilde\xi$ [illegible] $\tilde R$. [illegible] $\tilde\xi$ [illegible] ξ [illegible] N [illegible]:

1) [illegible] ξ [illegible] $\tilde\xi$ [illegible], [illegible] $N(\tilde\xi(\tilde r)) \supseteq \xi(N(\tilde r))$ [illegible] $\tilde r \in \tilde R$.

2) [illegible] ξ [illegible] $\tilde\xi$ [illegible], [illegible] $N(\tilde r\, \tilde\xi\, \tilde s) \supseteq N(\tilde r)\, \xi\, N(\tilde s)$ [illegible] $\tilde r, \tilde s \in \tilde R$.

[illegible] *4.* [illegible] ξ [illegible] R [illegible] $\tilde\xi$ [illegible] $\tilde R$. [illegible] $\tilde\xi$ [illegible] ξ [illegible] N [illegible]:

1) [illegible] ξ [illegible] $\tilde\xi$ [illegible], [illegible] $\tilde r \in \tilde R$ [illegible] $\tilde s \in \tilde R$, [illegible] $N(\tilde\xi(\tilde r)) \supset N(\tilde s) \supseteq \xi(N(\tilde r))$.

2) [illegible] ξ [illegible] $\tilde\xi$ [illegible], [illegible] $\tilde r, \tilde q \in \tilde R$ [illegible] $\tilde s \in \tilde R$, [illegible] $N(\tilde r\, \tilde\xi\, \tilde q) \supset N(\tilde s) \supseteq N(\tilde r)\, \xi\, N(\tilde q)$.

[illegible], [illegible] $\tilde\xi$ [illegible] ξ, [illegible] $\tilde\xi$ [illegible] ξ. [illegible], [illegible]. [illegible], [illegible], [illegible] .

4. [illegible]

[illegible]. [illegible], [illegible] $\tilde R$, [illegible], [illegible]. [illegible] (2).

$$\tilde R = \{\mu_{\tilde R}(x)/x\} = \tilde R[A(a_i)], \qquad (2)$$

[illegible] $\mu_{\tilde R}(x)$ [illegible] $A(a_i) = \{a_i \mid i = \overline{1,n}\}$, $x = dom(A(a_i))$.

[illegible] $C_{\tilde R}(\tilde R[A(a_i)])$, [illegible], [illegible]. [illegible] $A(a_i)$ [illegible] $B(b_i)$ [illegible] $\tilde R$, [illegible] (3).

$$C_{\tilde R}(\tilde R_A[A(a_i)]) = \tilde R_X[A(a_i \cup b_i)], \qquad (3)$$

[illegible] $a_i \in A$, $b_i \in B$, $\tilde{R}_X$ – [illegible] $dom(A(a_i) \cup B(b_i))$.

[illegible] $\tilde{R}_X$ [illegible] (4).

$$\mu_{\tilde{R}_X}(u, v) = \mu_{\tilde{R}_A}(u) \,\big|\, \forall (u \in dom(A(a_i)), (u, v) \in dom(a_i \cup b_i))) \qquad (4)$$

[illegible] $\tilde{R}_A[A(a_i) \cup B(b_i)]$, [illegible] $\tilde{R}_A$ – [illegible] $(u, v) \in dom(A(a_i)) \times dom(B(b_i))$, [illegible] $dom(A(a_i))$, [illegible] (5).

$$\pi_{B_i}(\tilde{R}_A[A(a_i \cup b_i)] = \tilde{R}_X[A(a_i)]), \qquad (5)$$

[illegible] $\tilde{R}_X$ – [illegible] $dom(A(a_i))$ [illegible] (6).

$$\mu_{\tilde{R}_X}(u) = max\{\mu_{\tilde{R}_A}(u, v) \,\big|\, u \in dom(A(a_i)), v \in dom(B(b_i)),$$
$$(u, v) \in (dom(A(a_i)) \times dom(B(b_i)))\}. \qquad (6)$$

[illegible] $\tilde{R}_A[A(a_i)]$ [illegible] $\tilde{R}_B[B(b_i)]$, [illegible] $A(a_i) \cap B(b_i) = \varnothing$, [illegible] (7).

$$\tilde{R}_A[A(a_i)] \times \tilde{R}_B[B(b_i)] = C_{b_i}(\tilde{R}_A[A(a_i)]) \cap C_{a_i}(\tilde{R}_B[B(b_i)])). \qquad (7)$$

[illegible] (8).

$$\tilde{R}_A[A(a_i)] + \tilde{R}_B[B(b_i)] = C_{b_i}(\tilde{R}_A[A(a_i)]) \cup C_{a_i}(\tilde{R}_B[B(b_i)])). \qquad (8)$$

[illegible] $\tilde{R}_X[B(b_i)]$ [illegible] $\tilde{R}_A[A(a_i)]$ [illegible] θ, [illegible] θ - [illegible] (<, >, =, ≤, ≥, ≠) [illegible] ¬ [illegible], ∧ [illegible], ∨ [illegible]. [illegible] $dom(B(b_i))$ [illegible] (9), [illegible] θ [illegible].

$$\{d_1^1, d_2^1, \ldots, d_n^1, d_1^2, d_2^2, \ldots, d_m^2, \ldots, d_1^p, d_2^p, \ldots, d_k^p\} \subset dom(A(a_i)), \qquad (9)$$

[illegible] (10).

$$\sigma_\theta(\tilde{R}_A[A(a_i)]) = \tilde{R}_X[B(b_i)]. \qquad (10)$$

[illegible] $\tilde{R}_A[A(a_i)]$ [illegible] $\tilde{R}_B[B(b_i)]$ [illegible] θ [illegible] $A(a_i)\ \theta\ B(b_i)$ [illegible] (11).

$$\forall u \in dom(A(a_i)) \,\big|\, \mu_{\tilde{R}_A}(u) = \mu_{\tilde{R}_B}(u). \qquad (11)$$

[illegible] (12).

$$\tilde{R}_A[A(a_i)]\ \theta\ \tilde{R}_B[B(b_i)], \qquad (12)$$

[illegible] $\theta = \{<, >, =, \le, \ge, \ne\}$.

[illegible] $\tilde{R}_A[A(a_i)]$ [illegible] $\tilde{R}_B[B(b_i)]$. [illegible] $A(a_i) = B(b_i)$ [illegible] (13).

$$\forall u \in dom(A(a_i)) \,\big|\, \mu_{\tilde{R}_A}(u) \le \mu_{\tilde{R}_B}(u). \qquad (13)$$

[illegible] (14).

$$\tilde{R}_A[A(a_i)] \subseteq \tilde{R}_B[B(b_i)]. \qquad (14)$$

[illegible] [2, 3]. [illegible] $\tilde{R}$ [illegible] (15).

$$\neg \tilde{R} = \bigcup_{u \in \tilde{R}} (1 - \mu_{\tilde{R}}(u) / u). \qquad (15)$$

[illegible] $\tilde{R}_A$ [illegible] $\tilde{R}_B$ [illegible] (14).

$$\tilde{R}_A \cup \tilde{R}_B = \bigcup_{u \in \tilde{R}} max[(\mu_{\tilde{R}_A}(u),\ \mu_{\tilde{R}_B}(u)] / u. \qquad (16)$$

[illegible] $\tilde{R}_A$ [illegible] $\tilde{R}_B$ [illegible] (17).

$$\tilde{R}_A \cap \tilde{R}_B = \bigcup_{u \in \tilde{R}} min[(\mu_{\tilde{R}_A}(u),\ \mu_{\tilde{R}_B}(u)] / u. \qquad (17)$$

[illegible]

[illegible]

[illegible]

1. [illegible] 2009. [illegible] 2(24). [illegible] 80-86.
2. [illegible] 2001. [illegible] 352 [illegible]
3. [illegible] 1987. [illegible] 608 [illegible]

[illegible]

[illegible]

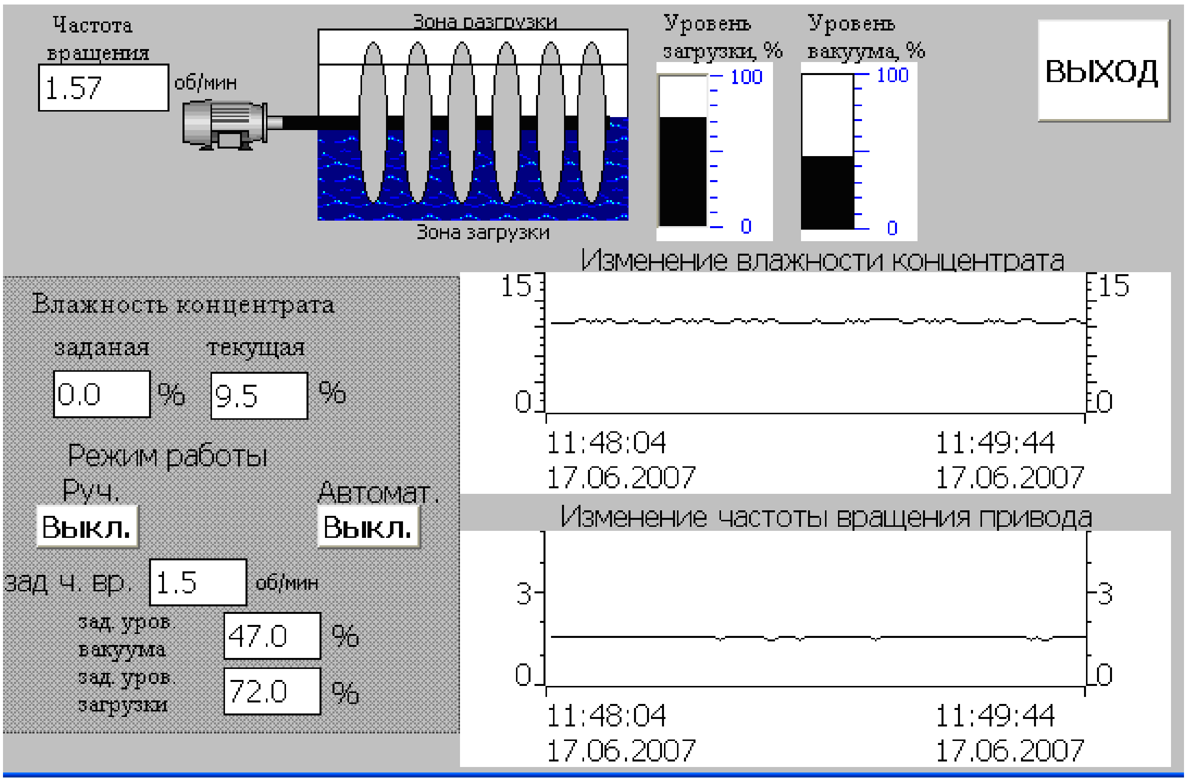
[illegible]

[illegible]

[illegible]

[illegible]

СТАБИЛИЗАЦИЯ ВЛАЖНОСТИ КОНЦЕНТРАТА ВАКУУМ-ФИЛЬТРА



Частота вращения 1.57 об/мин

Уровень загрузки, %

Уровень вакуума, %

ВЫХОД

Влажность концентрата
заданая 0.0 %
текущая 9.5 %

Режим работы
Руч. Выкл.
Автомат. Выкл.

зад ч. вр. 1.5 об/мин

зад. уров. вакуума 47.0 %

зад. уров. загрузки 72.0 %

Зона разгрузки
Зона загрузки
100
0
100
0
Изменение влажности концентрата
15
0
11:48:04
17.06.2007
11:49:44
17.06.2007
Изменение частоты вращения привода
3
0
11:48:04
17.06.2007
11:49:44
17.06.2007

[illegible] 1.

[illegible]

[illegible] FL-DIGI-MODUL [illegible]

[illegible]

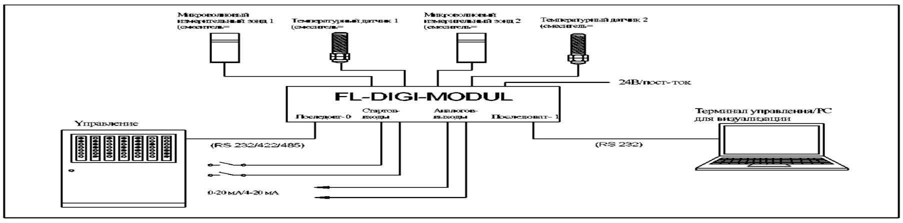
[illegible] FL-DIGI-MODUL [illegible]

FL-DIGI-MODUL [illegible] MASTER-SLAVE. [illegible]

[illegible] FL-DIGI-MODUL [illegible]

[illegible]

[illegible] FL-DIGI-MODUL [illegible] FL-DIGI-MODUL ([illegible]). [illegible]


Микроволновый измерительный зонд 1 (смеситель=
Температурный датчик 1 (смеситель=
Микроволновый измерительный зонд 2 (смеситель=
Температурный датчик 2 (смеситель=
24В/пост-ток
FL-DIGI-MODUL
Последоват-0
Стартов-входы
Аналогов-выходы
Последоват-1
Управление
(RS 232/422/485)
0-20 мА/4-20 мА
Терминал управления/PC для визуализации
(RS 232)

[illegible] 2. [illegible]

[illegible]

1. [illegible] // [illegible]. – 2013. – № 1. – [illegible] 2-8.
2. [illegible]. – 2-[illegible]. – [illegible], 2004. – 400 [illegible].
3. [illegible]. – 2002. - 183 [illegible].
4. [illegible], 2010.-183 [illegible].
5. [illegible]. – [illegible], 1985. – 560 [illegible].

[illegible]

[illegible]

[illegible]

[illegible] (FACTS).

[illegible] 50 % [illegible].

[illegible] 60 % [illegible] 25 % [illegible].

[illegible].

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] 10 % [illegible] 2,5 % [illegible]

[illegible]

[illegible] [1,2,3]. [illegible] [1].

[illegible]

1. [illegible] 2013. [illegible] 1. [illegible] 2-8.

2. [illegible] 2-[illegible] 2004. [illegible] 400 [illegible]

3. [illegible] 2002. - 183 [illegible]

4. [illegible] 2010.-183 [illegible]

5. [illegible] 1985. [illegible] 560 [illegible]

6. [illegible] «[illegible]», 2008.-480 [illegible]

7. [illegible] 2010.-520 [illegible]

[illegible]

[illegible]

$$\text{ʉ}_{\text{ɫ}} = f_1(T_{\text{ɫ}}),\qquad (1)$$

[illegible]

$$\text{ʉ}_{\text{ı}} = f_2(T_C).\qquad (2)$$

[illegible]

$$\text{ʊ}_{\text{ɫ}} \geq 0,\quad \text{ʊ}_{\text{ʉ}} \geq \text{ʊ}_{\text{ɫ}}.$$

(3)

[illegible]

$$\text{ʉ}_{\Sigma} = \text{ʉ}_{\text{ɫ}} + \text{ʉ}_{\text{ı}},\qquad (4)$$

[illegible]

$$\text{ʉ}_{\Sigma} = f_1(T_{\text{ɫ}}) + f_2(T_C)\qquad (5)$$

[illegible]

[illegible]

$$f_1(T_{\text{ɫ}}) = \text{ʉ}_1(\text{ʊ}_{\text{ɫ}}) + \text{ʉ}_2(\text{ʊ}_{\text{ɫ}}) + \text{ʉ}_3(\text{ʊ}_{\text{ɫ}}) + \text{ʉ}_4(\text{ʊ}_{\text{ɫ}}),\qquad (6)$$

[illegible]

$$\text{ʉ}_1(\text{ʊ}_{\text{ɫ}}) = \sum_{i=1}^{L} C_{ki}\cdot m_i(T_{\text{ɫ}}),\qquad (7)$$

[illegible] L ï [illegible]; ʉ_{ki} - [illegible] i- [illegible] i- [illegible]; $m_i(T_{\text{ɫ}})$ - [illegible] i- [illegible]

$\text{ʉ}_2(\text{ʊ}_{\text{ɫ}})$ - [illegible]

$$\text{ʉ}_2(\text{ʊ}_{\text{ɫ}}) = \text{ʉ}_{\text{ţ}}\cdot \text{ʊ}_{\text{ɘ}}\cdot \sum_{i=1}^{L} m_i(T_{\text{ɫ}}),\qquad (8)$$

[illegible] $\text{ʉ}_{\text{ţ}}$ - [illegible]; $\text{ʊ}_{\text{ɘ}}$ - [illegible].

$\text{ʉ}_3(\text{ʊ}_{\text{ɫ}})$ - [illegible]

$$\text{ʉ}_3(\text{ʊ}_{\text{ɫ}}) = W\cdot(K\cdot T_{\text{ɘ}} + \text{ʊ}_1 - \phi)\cdot \sum_{i=1}^{L} m_i(T_{\text{ɫ}}),$$

(9)

[illegible] W- [illegible]; K- [illegible] $\text{ʊ}_{\text{ɪ}}$ [illegible] A-

[illegible]

[illegible]

$$Ш_4(ʊ_ʇ) = Ɪ \cdot Ш_0 \cdot (ʂ \cdot ʊ_э + ʊ_1 - ɸ) \cdot \sum_{i=1}^{L} m_i(T_ʇ), \qquad (10)$$

[illegible] B=0,01.

[illegible]

$$Ш_ʇ = \sum_{i-1}^{L} C_{ki} \cdot m_i(T_ʇ) + \left[Ш_ʈ \cdot ʊ_э + (W + B \cdot C_0) \cdot (K \cdot T_э - ʊ_1 - ɸ)\right] \cdot \sum_{i=1}^{L} m_i(T_ʇ). \qquad (11)$$

[illegible]

[illegible] : 1- [illegible]; 2- [illegible]; 3- [illegible] [4].

[illegible]

[illegible] 1 [illegible]

[illegible] η, γ, ω [illegible]:

- $Ш_{11\eta}$ - [illegible] η [illegible]

- $Ш_{12\gamma}$ - [illegible] γ [illegible]

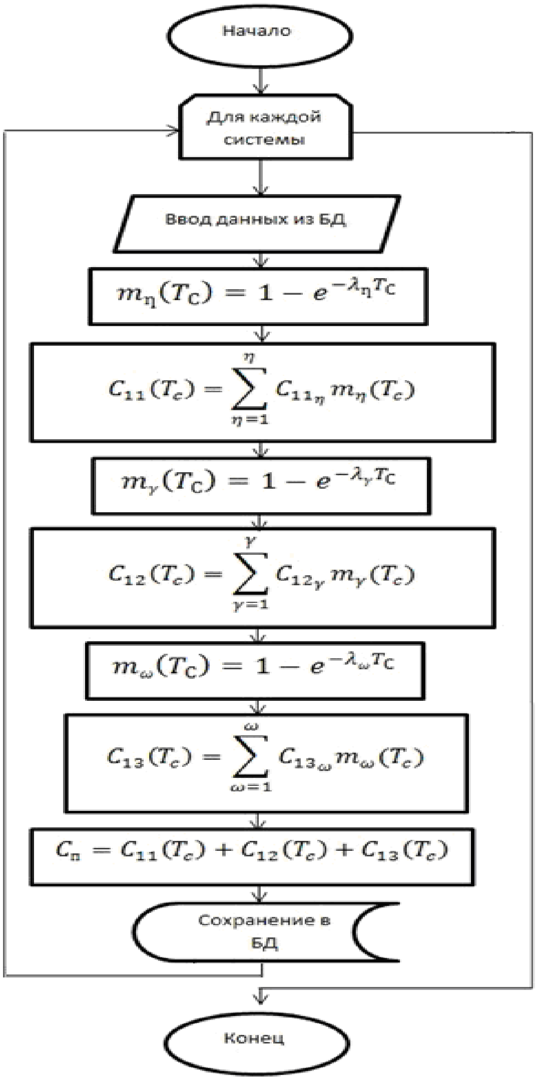
- $Ш_{13\omega}$ - [illegible] ω [illegible]

[illegible] $Ш_{12}$ [illegible] $Ш_{12}$ [illegible] $Ш_0$, [illegible] $Ш_{12}$ [illegible] $Ш_0$ [illegible].

[illegible] $Ш_{13}$ [illegible] $Ш_{13} = (0,5 \div 1) \cdot Ш_0$.

[illegible] $m_\eta(T_C), m_\gamma(T_C), m_\omega(T_C)$ [illegible] η, γ, ω [illegible].

[illegible]



Начало
Для каждой системы
Ввод данных из БД
$m_\eta(T_C) = 1 - e^{-\lambda_\eta T_C}$
$C_{11}(T_c) = \sum_{\eta=1}^{\eta} C_{11_\eta} m_\eta(T_c)$
$m_\gamma(T_C) = 1 - e^{-\lambda_\gamma T_C}$
$C_{12}(T_c) = \sum_{\gamma=1}^{\gamma} C_{12_\gamma} m_\gamma(T_c)$
$m_\omega(T_C) = 1 - e^{-\lambda_\omega T_C}$
$C_{13}(T_c) = \sum_{\omega=1}^{\omega} C_{13_\omega} m_\omega(T_c)$
$C_п = C_{11}(T_c) + C_{12}(T_c) + C_{13}(T_c)$
Сохранение в БД
Конец

[illegible] 1. [illegible]

[illegible]

1. [illegible] 27.005-97. [illegible] 01.01.99. [illegible] 45 [illegible]

2. [illegible] 2003. [illegible] 320[illegible]

3. [illegible] 51901-2002. [illegible] 2002. - 22[illegible]

4. [illegible] 2005. [illegible] 479 [illegible]

[illegible]

[illegible]

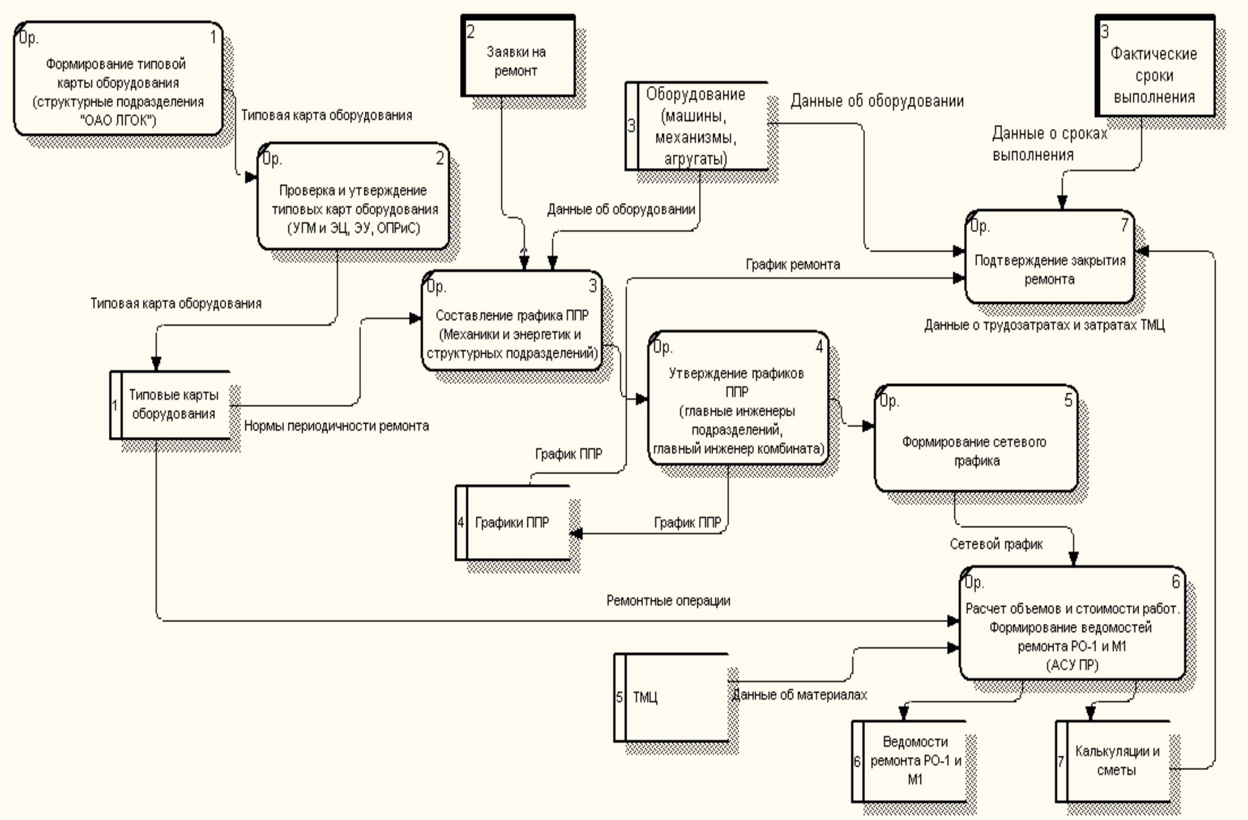
[illegible]

[illegible]

[illegible]

[illegible]

[illegible] DFD [illegible] 1


Op. 1
Формирование типовой карты оборудования (структурные подразделения "ОАО ЛГОК")
Типовая карта оборудования
2 Заявки на ремонт
3 Оборудование (машины, механизмы, агругаты)
Данные об оборудовании
3 Фактические сроки выполнения
Данные о сроках выполнения
Op. 2
Проверка и утверждение типовых карт оборудования (УГМ и ЭЦ, ЭУ, ОПРиС)
Данные об оборудовании
Op. 7
Подтверждение закрытия ремонта
График ремонта
Типовая карта оборудования
Op. 3
Составление графика ППР (Механики и энергетик и структурных подразделений)
Данные о трудозатратах и затратах ТМЦ
Op. 4
Утверждение графиков ППР (главные инженеры подразделений, главный инженер комбината)
1 Типовые карты оборудования
Нормы периодичности ремонта
Op. 5
Формирование сетевого графика
График ППР
4 Графики ППР
График ППР
Сетевой график
Ремонтные операции
Op. 6
Расчет объемов и стоимости работ. Формирование ведомостей ремонта РО-1 и М1 (АСУ ПР)
5 ТМЦ
Данные об материалах
6 Ведомости ремонта РО-1 и М1
7 Калькуляции и сметы

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

$$t_{[illegible] i j} = t_{[illegible] i(j-1)} + \frac{T_i}{K_{[illegible] i}} ; \qquad (1)$$

$$t_{[illegible] i j} = t_{[illegible] i j} + \varphi T_i ; \qquad (2)$$

[illegible]:

i – [illegible];

j – [illegible];

$t_{[illegible] i j}$ – [illegible] j-[illegible] i-[illegible];

$t_{[illegible] i j}$ – [illegible] j-[illegible] i-[illegible];

$t_{[illegible] i, j-1}$ – [illegible] $(j - 1)$-[illegible] i-[illegible];

ΔT_i – [illegible] i-[illegible];

T_i – [illegible] i-[illegible];

$K_{[illegible] i}$ – [illegible] i-[illegible].

[illegible]

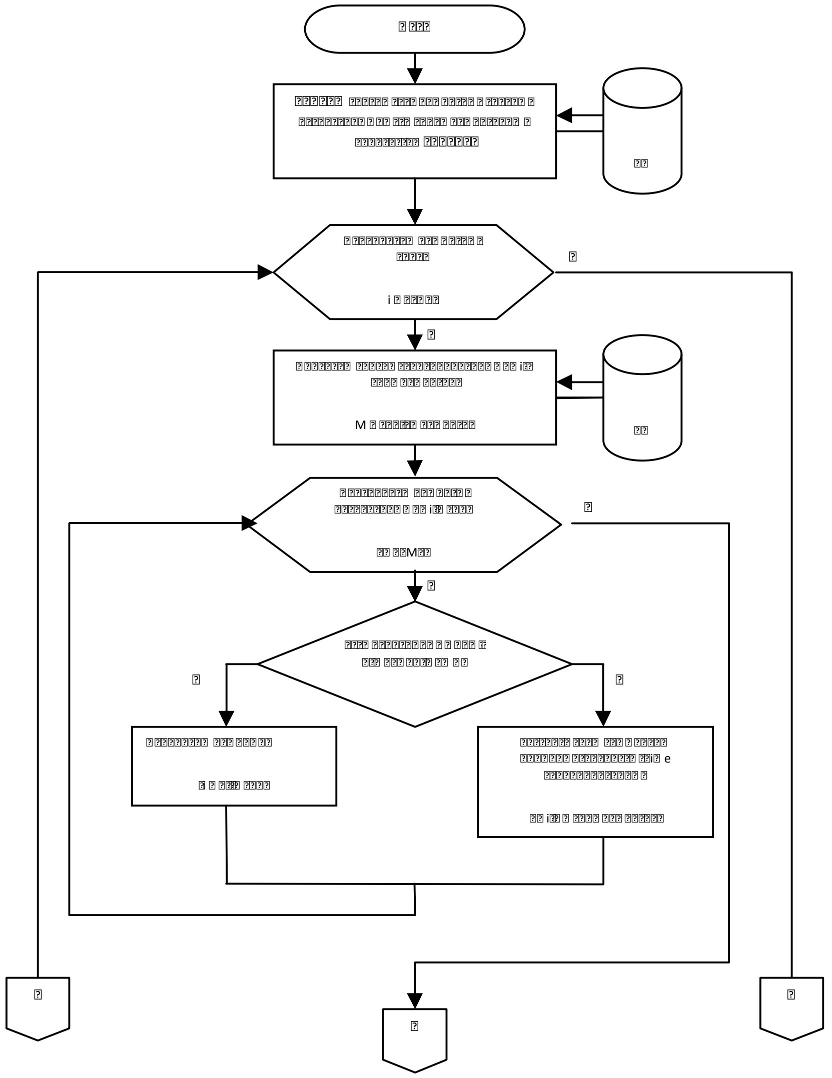
[illegible]

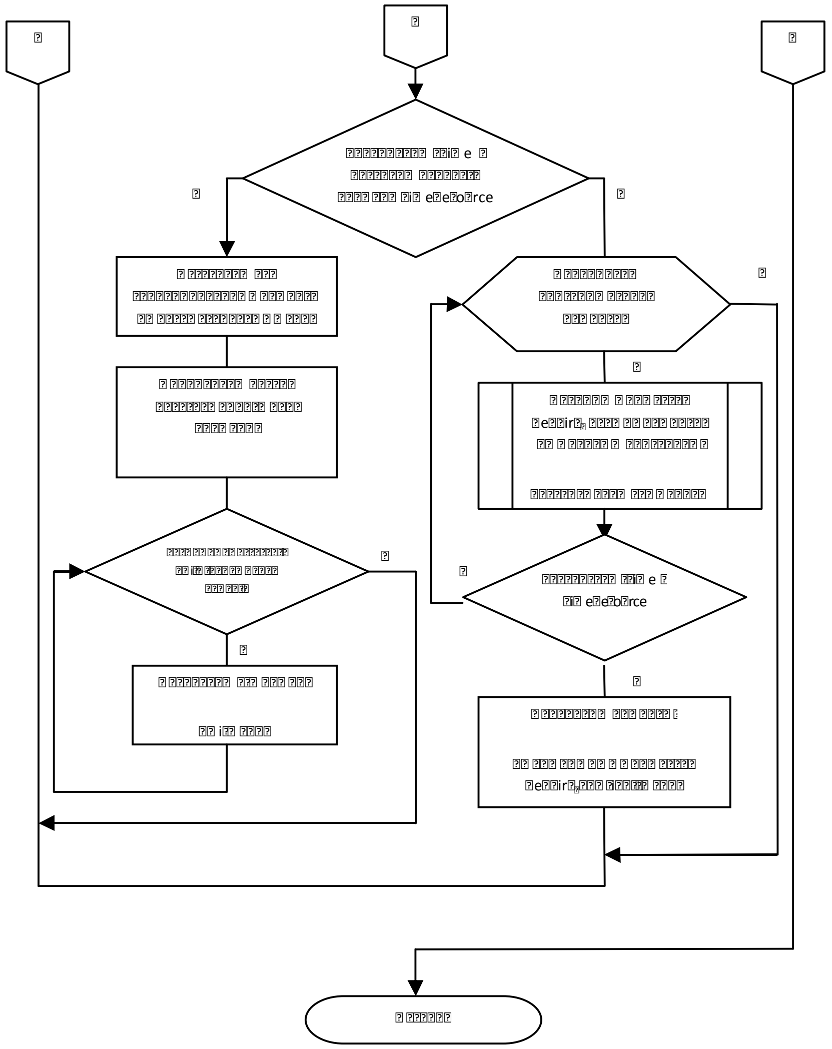
[illegible]

Å [illegible]

Å [illegible]

Å [illegible]





[illegible] 2. [illegible]

[illegible]:

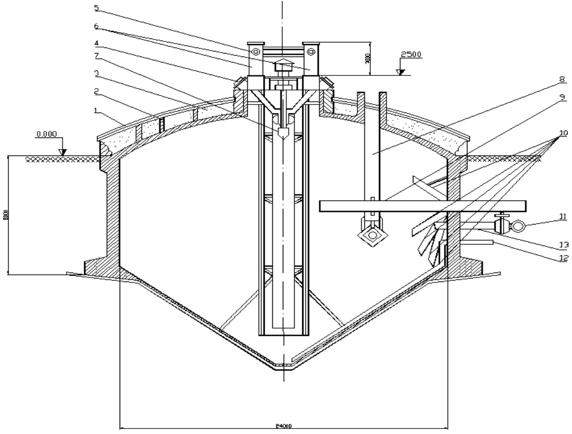
l - [illegible] ($l = \overline{1, L}$);
L – [illegible];
k – [illegible];
T_k – [illegible] k – [illegible]
[illegible]:

1[illegible] l-[illegible], [illegible].

2[illegible].

3.[illegible].

4.[illegible]

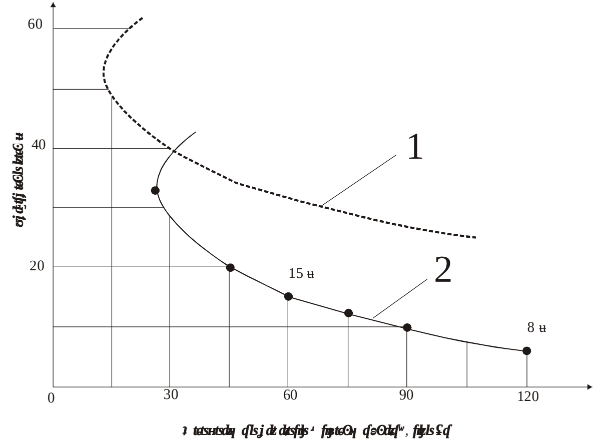

5
6
4
7
3
2
1
0.000
8100
300
2500
8
9
10
11
13
12
Ø4000

1 – [illegible], 2 – [illegible], 3 – [illegible], 4 – [illegible], 5 – [illegible], 6 – [illegible], 7 – [illegible], 8 – [illegible], 9 – [illegible], 10 – [illegible], 11 – [illegible], 12 – [illegible], 13 – [illegible].

[illegible] 2 – 22%; [illegible]

[illegible]

[illegible] 2 [illegible]



[illegible] 2. [illegible] (1 – [illegible], 2 – [illegible])

[illegible] (2) [illegible] 2 [illegible]

[illegible] (1). [illegible]

[illegible] 1. [illegible]

[illegible]	[illegible]	[illegible], %		[illegible]	[illegible]
		[illegible] 4	[illegible] 2		
[illegible]	790	50	50	$1,25 \cdot 10^3$	0,985
[illegible]	1250	68	32	$1,05 \cdot 10^3$	1,31
[illegible]	704	71	29	$1,01 \cdot 10^3$	0,71

[illegible] (2).

[illegible] 2. [illegible]

[illegible]	[illegible], %	[illegible]
[illegible]	45	0,27
[illegible]	30	0,15

[illegible] 3.

[illegible] 3. [illegible], % [illegible].

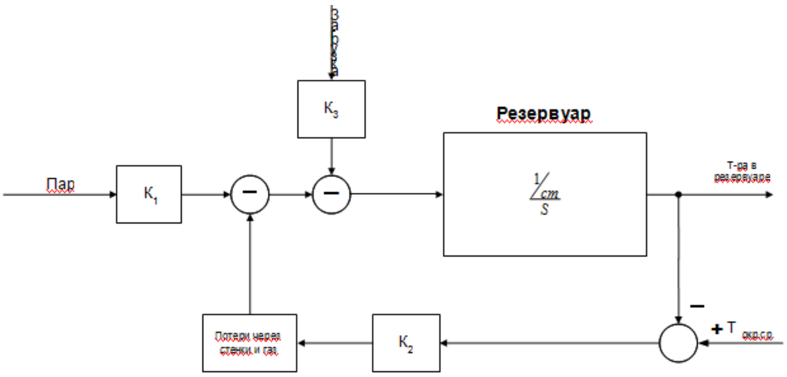
[illegible]	[illegible], %				
	93	94	95	96	97
[illegible]	7	8	9	10	11
[illegible]	14	16	18	20	22

[illegible]

[illegible]

[illegible]

[illegible] (3).


Загрузка
K3
Резервуар
Пар
K1
1/cm
S
Т-ра в резервуаре
−
+ T окр.ср.
Потери через стенки и газ
K2

[illegible] 3. [illegible]

[illegible]

[illegible]

[illegible]

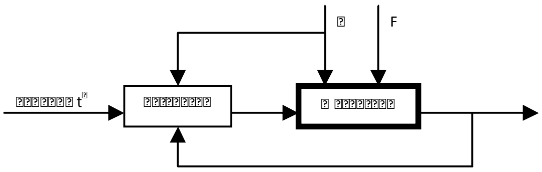
[illegible]

[illegible]

[illegible]

[illegible]

[illegible] 4.



[illegible] 4. [illegible] .

[illegible] F [illegible]

[illegible]

[illegible]

1) [illegible] 3/2, (21), 2005 ([illegible] 44-47).

[illegible] BPWIN

[illegible] «[illegible]»

[illegible] BPwin.

[illegible] [3, [illegible] 6]

[illegible] [3, [illegible] 7]

[illegible]: 1) [illegible] ([illegible]) [illegible]; 2) [illegible] ([illegible]) [illegible] ([illegible]). [illegible]

[illegible].

[illegible].

[illegible]. [3, 7]

[illegible]

Bpwin [illegible] Computer Associates, [illegible] Erwin Data Modeler (Erwin), Model Manager (ModelMart) [illegible] Data Model Validator (Erwin Examiner), [illegible] AllFusion Modeling Suite. [2, [illegible] 30]

Bpwin [illegible]. [illegible] Bpwin, [illegible] IT. [illegible] Bpwin [illegible] [2, [illegible] 30]

[illegible] BPWin [illegible]. Bpwin-[illegible]

[illegible] Bpwin [illegible].

BPWin [illegible]:

- [illegible] (IDEF0). [illegible]
- [illegible] (IDEF3). [illegible] IDEF3 [illegible] IDEF3 [illegible]
- [illegible] (DFD). [illegible] (DFD) [illegible] [3, [illegible]35]

[illegible] BPWin [illegible]

[illegible] Bpwin [illegible]

[illegible] Bpwin [illegible] Bpwin, [illegible]

[illegible]:

- [illegible]
- [illegible]
- [illegible] [3, 47]

[illegible] Bpwin [illegible] Bpwin [illegible] ISO 9000, [illegible]

[illegible] , [illegible]. [illegible] Bpwin [illegible], [illegible] IDEF0. [illegible] IDEF0 [illegible]. Process Modeler [illegible]. [illegible] Bpwin [illegible]. [illegible].

[illegible], [illegible], [illegible], [illegible].

[illegible], [illegible]. [illegible], [illegible]. [illegible], [illegible].

[illegible], [illegible]. [illegible].

[illegible] (as is) [illegible] (to be). [1, [illegible] 25]

[illegible], [illegible], [illegible], [illegible]. [1, [illegible]10]

[illegible], [illegible] ([illegible]), [illegible]:

1. [illegible];
2. [illegible];
3. [illegible], [illegible];
4. [illegible], [illegible];
5. [illegible], [illegible].

[illegible], [illegible], [illegible]. [illegible] Bpwin.

[illegible], [illegible], [illegible]. [illegible]

[illegible] 2007, 180 c.

[illegible]

1. [illegible] 2007, 180 c.
2. [illegible] AllFusion Process Modeler/ [illegible] », 2008, 240 [illegible]
3. [illegible] », [illegible] 2008, 408 [illegible]

[illegible]

[illegible]

[illegible] [1], [illegible]

1. [illegible] 1 ([illegible])

- [illegible] ([illegible]).

[illegible] 90%.

2. [illegible] 2 ([illegible])

- [illegible] k1 [illegible];

$$k1 = (\ln N)^2 \quad (1)$$

[illegible] N ï [illegible].

- [illegible] kl [illegible] k2 [illegible] kl [illegible]

$$\ln k_1 \le k_2 \le (\ln k_1)^2 \quad (2)$$

[illegible].

- [illegible] ï [illegible].

[illegible]:

$$A = \{(i, j, a_{i,j})\}, 0 \le i, j \le N \quad (3)$$

[illegible] A [illegible] C [illegible]:

$$D(A,C) = \sqrt{\frac{1}{2ZN}\left\{\sum_{i,j}^{N}[d(a_{ij},C) = d(c_{ij},A)]^2\right\}^{1/2}} \quad (4)$$

$$d(a_{ij},C) = d(a_{ij},C_w) = \min_{(l,m)eW}\{d(A_{ij},C_{im})\} \quad (5)$$

[illegible] W ï [illegible] (2w+1)x(2w+1) [illegible] (i,j) [illegible] 98,5%.

3. [illegible] ([illegible]) ï [illegible].

[illegible]:

- N - [illegible] S ï [illegible] S = {S1,S2,é ,SN}. [illegible] t [illegible] q_t (q_t‘S), 1Ò t ÒT, [illegible] T ï [illegible] ([illegible]).
- M - [illegible] V ï [illegible] V = {v1,v2,é ,vM}.

- A - [illegible], $A = \{a_{ij}\}$, [illegible] $a_{i,j} = P[q_t = S_j \mid q_{t-1} = S_i]$ $1 \le i, j \le N$, $0 \le a_{i,j} \le 1$

$$\sum_{j}^{N} a_{ij} = 1, 1 \le i \le N \tag{6}$$

- B - [illegible], $B = \{b_j(k)\}$, [illegible]

$$b_j(k) = P[O_t = v_k \mid q_t = S_j] \tag{7}$$

O_t [illegible] t

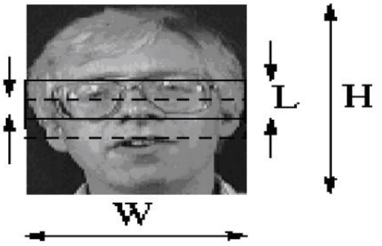
- π - [illegible],

$\pi = \{\pi_i\}$, [illegible] $\pi_i = P[q_i = S_i], 1 \le i \le N$ (8)

[illegible]:

$$\lambda = (A, B, \pi) \tag{9}$$

[illegible] W [illegible] H [illegible] L [illegible] W. [illegible] P [illegible]1).



[illegible]1 [illegible]

[illegible] T [illegible]:

$$T = \frac{H - L}{L - P} + 1 \tag{10}$$

- [illegible] P [illegible] L [illegible].

- [illegible]

[illegible] P(O|l). [illegible] k [illegible]:

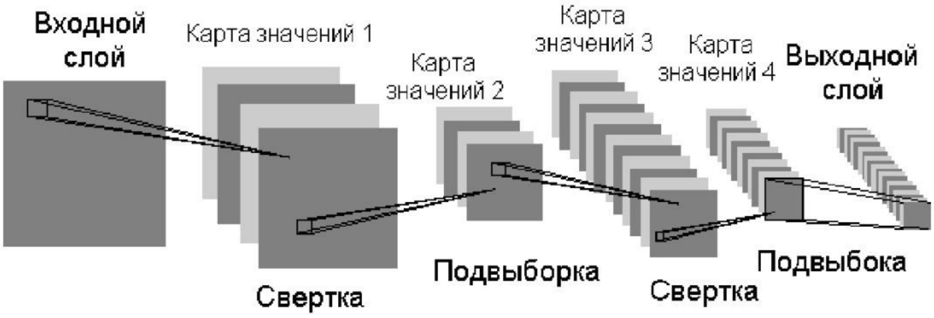
$$P(O^{(t)} \mid l_k) \max_n P(O^{(t)} \mid l_k \qquad (11)$$

[illegible] 84% [illegible].

4. [illegible] 2. [illegible]

[illegible]

[illegible]


Входной слой
Карта значений 1
Карта значений 2
Карта значений 3
Карта значений 4
Выходной слой
Свертка
Подвыборка
Свертка
Подвыбока

[illegible] 2 [illegible]

[illegible]

[illegible]

1. [illegible] 4 [illegible].

2. [illegible] 25 [illegible] 125 [illegible].

3. [illegible] 3 [illegible].

4. [illegible].

[illegible] 1,33% [illegible] 5.75%.

[illegible]:

- [illegible]
- [illegible];
- [illegible].

[illegible]

[illegible]

1. [illegible] //IV [illegible] - 2004.- [illegible] 1.- [illegible] 85-90.

[illegible] LONALG

[illegible]

[illegible] [1]. [illegible]

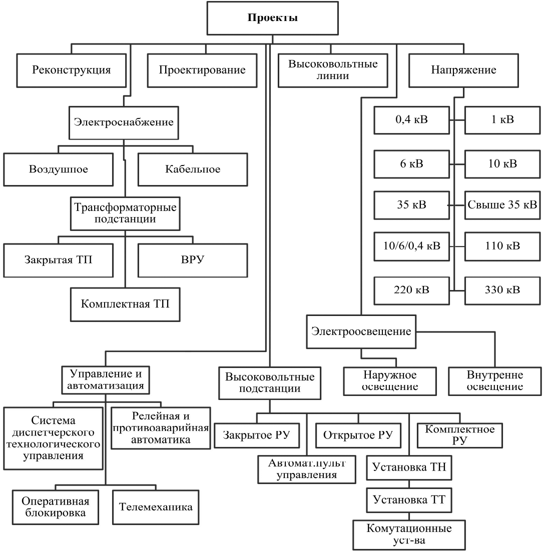
[illegible] Autocad, [illegible] [2].

[illegible] [3].

[illegible]

[illegible] Data Mining ([illegible]). [illegible] Data Mining, [illegible]

[illegible] Data Mining [illegible] L. N. De Castro [illegible] F.J. Von Zuben. [4]. [illegible] [5]. [illegible] aiNet [illegible] LONALG. [6] [illegible] n-[illegible]


Проекты
Реконструкция
Проектирование
Высоковольтные линии
Напряжение
Электроснабжение
Воздушное
Кабельное
Трансформаторные подстанции
Закрытая ТП
ВРУ
Комплектная ТП
0,4 кВ
1 кВ
6 кВ
10 кВ
35 кВ
Свыше 35 кВ
10/6/0,4 кВ
110 кВ
220 кВ
330 кВ
Электроосвещение
Управление и автоматизация
Высоковольтные подстанции
Наружное освещение
Внутренне освещение
Система диспетчерского технологического управления
Релейная и противоаварийная автоматика
Закрытое РУ
Открытое РУ
Комплектное РУ
Автомат.пульт управления
Установка ТН
Установка ТТ
Оперативная блокировка
Телемеханика
Комутационные уст-ва

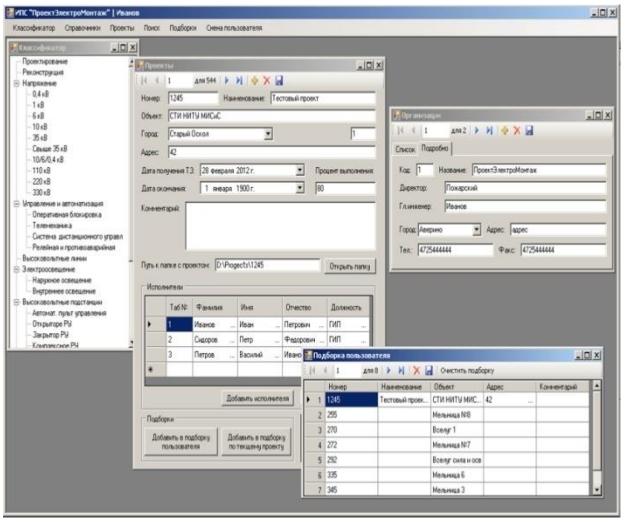
[illegible] 1. [illegible] « [illegible] »

[illegible] (affinity), [illegible]

[illegible] [7].

[illegible] Microsoft Visual C#2008Express Edition. [illegible] MS SQL Server 2008 Express Edition. [illegible] 2.

[illegible]


ИПС "ПроектЭлектроМонтаж" | Иванов

Класcификатор
Справочники
Проекты
Поиск
Подборки
Смена пользователя
Классификатор
Проектирование
Реконструкция
Напряжение
0,4 кВ
1 кВ
6 кВ
10 кВ
35 кВ
Свыше 35 кВ
10/6/0,4 кВ
110 кВ
220 кВ
330 кВ
Управление и автоматизация
Оперативная блокировка
Телемеханика
Система дистанционного управл
Релейная и противоаварийная
Высоковольтные линии
Электроосвещение
Наружное освещение
Внутреннее освещение
Высоковольтные подстанции
Автомат. пульт управления
Открытое РУ
Закрытое РУ
Комплексное РУ
Проекты
для 544
Открыть папку
Исполнители
Добавить исполнителя
Подборки
Добавить в подборку пользователя
Добавить в подборку по текущему проекту
Организации
для 2
Список
Подробно
Подборка пользователя
для 8
Очистить подборку

Проекты: 1 для 544

Номер: 1245
Наименование: Тестовый проект
Объект: СТИ НИТУ МИСиС
Город: Старый Оскол
Адрес: 42
Дата получения ТЗ: 28 февраля 2012 г.
Процент выполнения: 80
Дата окончания: 1 января 1900 г.
Комментарий:
Путь к папке с проектом: D:\Progects\1245

	Таб №	Фамилия	Имя	Отчество	Должность
▸	1	Иванов	Иван	Петрович	ГИП
	2	Сидоров	Петр	Федорович	ГИП
	3	Петров	Василий	Иванo	

Организации: 1 для 2

Код: 1
Название: ПроектЭлектроМонтаж
Директор: Пожарский
Гл.инженер: Иванов
Город: Аверино
Адрес: адрес
Тел.: 4725444444
Факс: 4725444444

Подборка пользователя: 1 для 8

	Номер	Наименование	Объект	Адрес	Комментарий
1	1245	Тестовый проек...	СТИ НИТУ МИС...	42	
2	255		Мельница №8		
3	270		Всепут 1		
4	272		Мельница №7		
5	292		Всепут сила и осв		
6	335		Мельница 6		
7	345		Мельница 3		

[illegible] 2. [illegible]

[illegible]

[illegible]

1. [illegible] // [illegible] 2009. – [illegible] 7. – [illegible] 2. – [illegible] 3-17.

2. [illegible] 05.13.01 / [illegible] 2007. - 130 [illegible]

3. [illegible] (22 [illegible] 2011 [illegible]) [illegible] 2011, 613 [illegible]

4. L. N. De Castro, F.J. Von Zuben. 2000a. Artificial Immune Systems: Part II ï A Survey of Applications, Technical Report ï RT DCA 02/00, p. 65.

5. Julie Greensmith New Frontiers For An Artificial Immune System Digital Media Systems Laboratory, HP Laboratories Bristol, HPL-2003-204, October 7th , 2003*.Los Alamitos, CA, USA, 2002. IEEE Computer Society, http://ima.ac.uk/papers/greensmith2003.pdf -20.07.2013ǵ.

6. L. de Castro and J.Timmis. An artificial immune network for multimodal function optimization. In Proc. of the Congress on Evolutionary Computation (CEC), V. 1, P. 699ï704.

7. [illegible] 2011. [illegible] 2(44). [illegible]. 81-85.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [1], [illegible]

[illegible]

1. [illegible] ([illegible]).

2. [illegible] ([illegible] , [illegible])

[illegible]

[illegible]

[illegible]

[illegible]

$$I = \int_0^T G(t)dt \Big/ \int_0^T G(t)dt. \qquad (1)$$

[illegible]

[illegible]

[illegible] [2], [illegible] Vo [illegible]

$$V_0 = \frac{-150\mu \cdot a + \sqrt{(150\mu \cdot a)^2 + 7\rho \cdot b \cdot \frac{\Delta p_1}{1,3 \cdot H}}}{3,5\rho \cdot b}, \qquad (2)$$

[illegible] μ [illegible]

$$a = \frac{(1-\varepsilon)^2}{\varepsilon^3 \cdot d^2}; \qquad b = \frac{1-\varepsilon}{\varepsilon^3 \cdot d};$$

[illegible] d [illegible]

[illegible] Vo [illegible]

[illegible] (3)

$$\begin{cases} V_0 = \dfrac{-150\mu \cdot a + \sqrt{(150\mu \cdot a)^2 + 7\rho \cdot b \cdot \dfrac{\Delta p}{1{,}3 \cdot H}}}{3{,}5\rho \cdot b}; \\ Q = V_0 \cdot S \cdot \varepsilon \cdot \dfrac{L}{V_{\text{[illegible]}}} \cdot C_{\text{[illegible]}} \cdot (\Theta_{\text{[illegible]}} - \Theta_{\text{[illegible]}}); \\ \Theta_{\text{[illegible]}} = \Theta_{\text{[illegible]}} + \dfrac{k \cdot Q \cdot V_{\text{[illegible]}}}{L \cdot G_{\text{[illegible]}} C_{\text{[illegible]}}}; \\ U_{\text{[illegible]}} = U_{\text{[illegible]}} - \dfrac{(1-k) \cdot Q \cdot V_{\text{[illegible]}}}{L \cdot G_{\text{[illegible]}} \cdot \lambda} \end{cases} \qquad (3)$$

[illegible] S – [illegible]; *L* – [illegible]; k – [illegible]; *V* – [illegible]; *G* – [illegible]; [illegible] – [illegible]; *U* – [illegible]; *U* – [illegible]; [illegible] – [illegible].

[illegible]:

- [illegible] U > 0;
- [illegible] Q [illegible] (4)

$$Q_{\text{[illegible]}} = \frac{L}{V_{\text{[illegible]}}} \cdot \left(G_{\text{[illegible]}} \cdot q_{\text{[illegible]}} + G_{\text{[illegible]}} \cdot q_{\text{[illegible]}}\right), \qquad (4)$$

[illegible] *G* – [illegible]; *G* – [illegible]; *q* – [illegible]; *q* – [illegible];

- [illegible].

[illegible] [3]. [illegible] (*V*; *U*; *d*; [illegible]) [illegible].

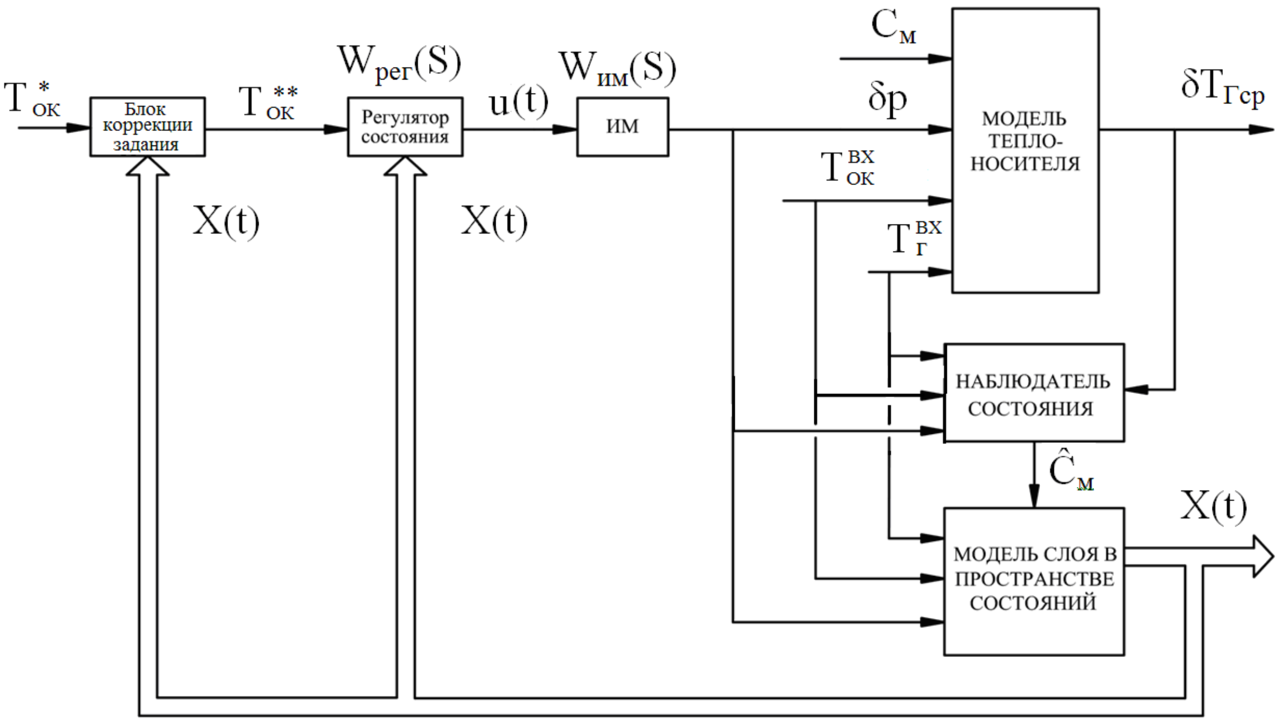
[illegible] [4] [illegible] – [illegible], ∆p – [illegible], [illegible] – [illegible] - [illegible] - [illegible].

[illegible]

[illegible] [5], [illegible]

[illegible]

[illegible]



$T^{*}_{ОК}$
Блок коррекции задания
$T^{**}_{ОК}$
$W_{рег}(S)$
Регулятор состояния
u(t)
$W_{ИМ}(S)$
ИМ
$C_{М}$
δp
$T^{ВХ}_{ОК}$
$T^{ВХ}_{Г}$
МОДЕЛЬ ТЕПЛО-НОСИТЕЛЯ
$\delta T_{Гср}$
X(t)
X(t)
НАБЛЮДАТЕЛЬ СОСТОЯНИЯ
$\hat{C}_{М}$
X(t)
МОДЕЛЬ СЛОЯ В ПРОСТРАНСТВЕ СОСТОЯНИЙ

[illegible]1. [illegible]

[illegible]

[illegible]

1. [illegible]

[illegible]: 05.16.02 / [illegible]. [illegible] – 2012. [illegible] 348 [illegible]

2. [illegible] // [illegible] 2010. [illegible] 6. – [illegible] 5. [illegible] 128-132.

3. [illegible] // «[illegible]», 2013, [illegible] 3. [illegible] http://www.ivdon.ru/magazine/archive/n3y2013/1754 ([illegible])

4. [illegible] // [illegible] ([illegible]). 2011. [illegible] 8. [illegible] 189-194.

5. [illegible] – [illegible]: [illegible], 2007. – 224 [illegible]

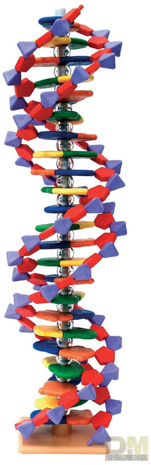
[illegible]

[illegible], [illegible]

[illegible]

[illegible]

[illegible] 1950-[illegible] [illegible] 1).



[illegible]

[illegible] 10 [illegible] 10 [illegible]

[illegible]

[illegible] 1980-[illegible] (Nadrian Seeman) [illegible]

[illegible] «[illegible]».

[illegible] 1994 [illegible]

[illegible]

[illegible] (Turing) [illegible] 2002 [illegible]

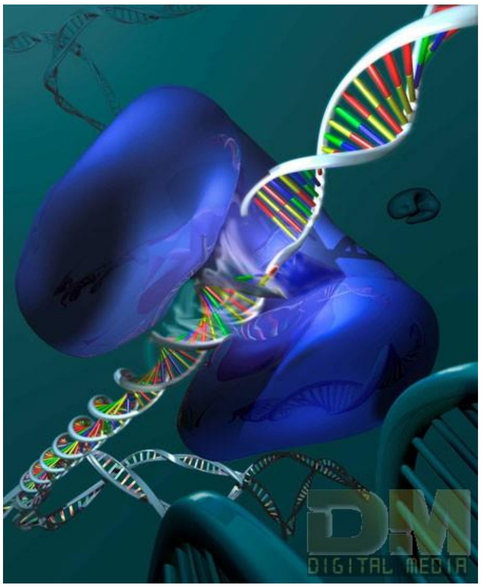
[illegible] 2004 [illegible] (Nature) [illegible] (Ehud Shapiro), [illegible] (Yaakov Benenson), [illegible] (Binyamin Gil), [illegible] (Uri Ben-Dor) [illegible] (Rivka Adar).

[illegible] 99,8%. [illegible]

[illegible]

[illegible]

[illegible] 2).


DM
DIGITAL MEDIA

[illegible] 2

[illegible]

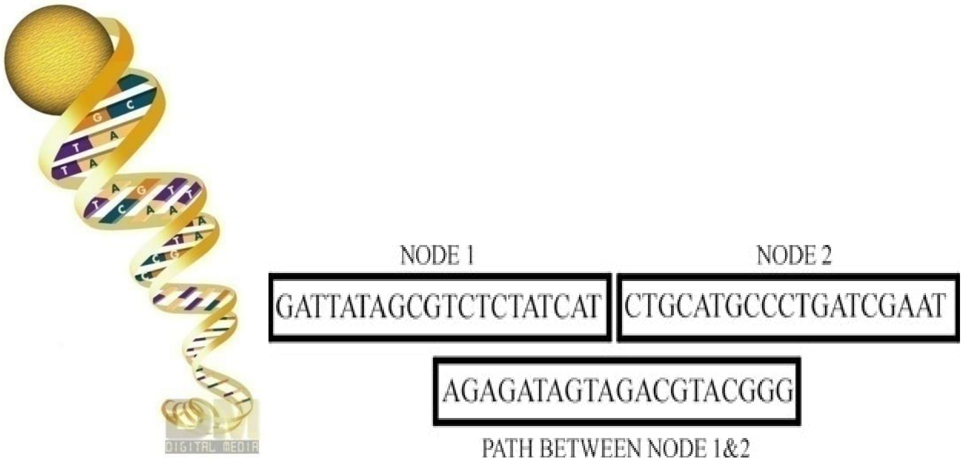
[illegible]

[illegible]

[illegible]

[illegible]

[illegible] (3).


G
C
T
A
A
T
G
T
A
A
C
G
NODE 1
NODE 2
GATTATAGCGTCTCTATCAT
CTGCATGCCCTGATCGAAT
AGAGATAGTAGACGTACGGG
PATH BETWEEN NODE 1&2
DIGITAL MEDIA

[illegible] 3

[illegible] (A), [illegible] (G), [illegible] (C) [illegible] (T), [illegible] ([illegible]), [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [1], [illegible]

[illegible] 1.

[illegible]

[illegible] [2]:

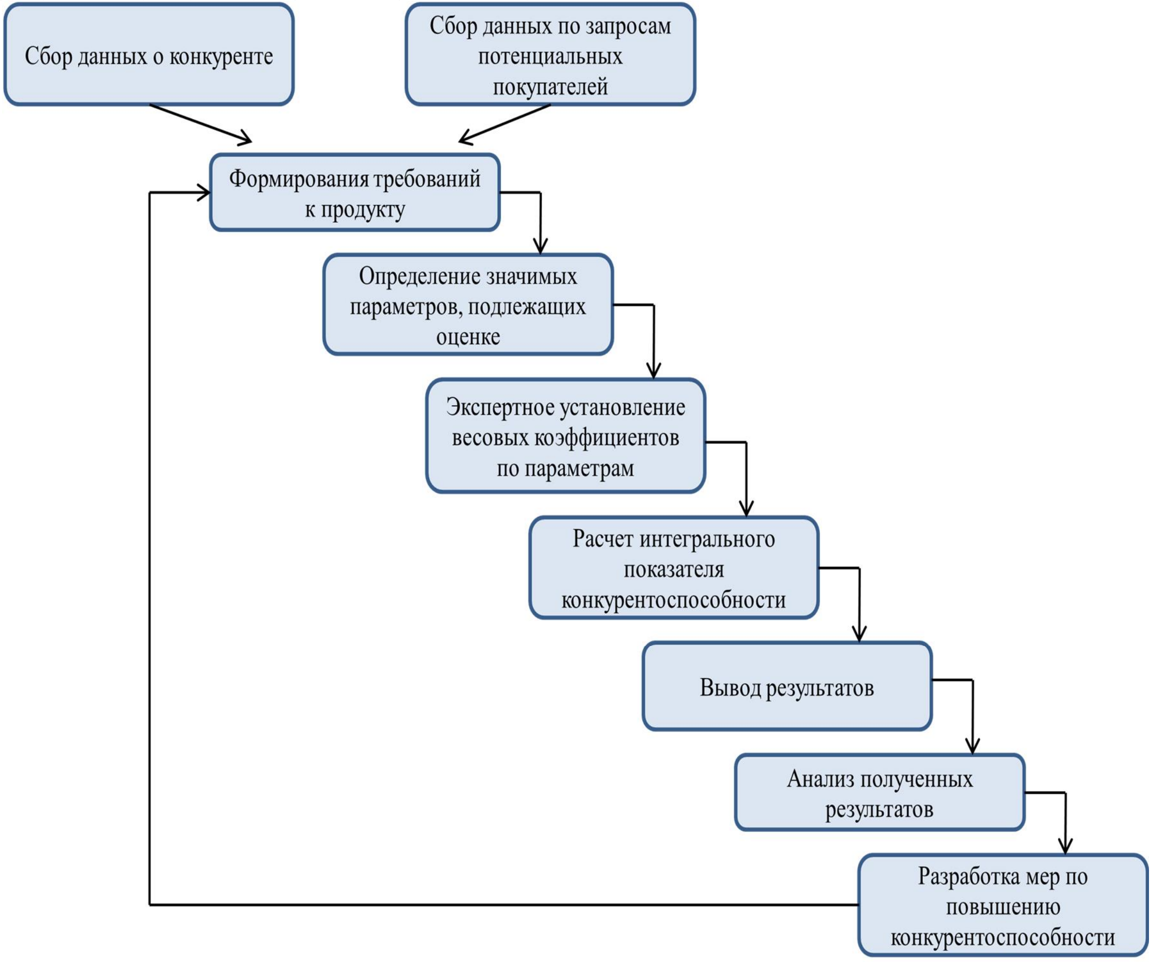
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]


Сбор данных о конкуренте
Сбор данных по запросам потенциальных покупателей
Формирования требований к продукту
Определение значимых параметров, подлежащих оценке
Экспертное установление весовых коэффициентов по параметрам
Расчет интегрального показателя конкурентоспособности
Вывод результатов
Анализ полученных результатов
Разработка мер по повышению конкурентоспособности

[illegible] 1. [illegible]

[illegible]:

1. [illegible]

2. [illegible] (qi).

$$q_i = \frac{P_i}{P_{i0}} \text{ , (1)}$$

[illegible] q_i – [illegible] i-[illegible];

P_i – [illegible] i-[illegible];

P_{io} – [illegible] i-[illegible].

3. [illegible] Q_i – [illegible] Q_i – [illegible] 2.

$$\sum_{i=1}^{n} a_{ni} = \sum_{i=1}^{m} a_{\text{ɫ}i} \text{ , (2)}$$

[illegible] n [illegible] m – [illegible].

4. [illegible]:

$$Q_n = \sum_{i=1}^{n} q \; * a_{ni} \text{ , (3)}$$

$$Q_{\text{ɫ}} = \sum_{i=1}^{m} q_i * a_{\text{ɫ}i} \text{ , (4)}$$

[illegible] Q_n [illegible] $Q_{\text{ɫ}}$ – [illegible].

[illegible] 2 [illegible] Q_n [illegible] $Q_{\text{ɫ}}$ [illegible].

[illegible]

$$K = \frac{Q_n}{Q_{\text{ɫ}}} \text{ (5)}$$

[illegible] K > 1, [illegible] K < 1 – [illegible].

[illegible]:

- [illegible];
- [illegible];
- [illegible];
- [illegible];
- [illegible];
- [illegible];

- [illegible];
- [illegible].

[illegible]

1. [illegible] 2007.-192 [illegible]

2. [illegible] 2009. [illegible] 406.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [1]. [illegible]

[illegible] $\mathcal{R}_n$ [illegible] n [illegible] $\mathcal{H}_n$ - [illegible] $\mathcal{R}_n$.

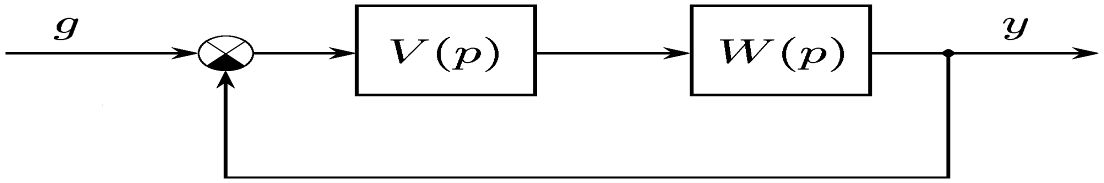
[illegible]

$$W(p)=\frac{B(p)}{A(p)}e^{-\beta(p)/\alpha(p)}, \tag{1}$$

[illegible] $A(p)\in\mathcal{H}_m$, $B(p)\in\mathcal{R}_l$, $m\geq l$; $\alpha(p)\in\mathcal{H}_k$, $\beta(p)\in\mathcal{R}_q$; [illegible]

$$V(p)=\frac{S(p)}{R(p)},\quad S(p)\in\mathcal{R}_s,\ R(p)\in\mathcal{R}_r,\ s\leq r<+\infty, \tag{2}$$

[illegible] 1.



[illegible] 1

[illegible]

[illegible] [2]. [illegible] $|p|<\Omega$ [illegible] p, [illegible] $0 \le \omega < \Omega$. [illegible] $|p|<\Omega$, [illegible] $\widetilde{W}(p)$ [illegible] $W(p)$, [illegible] $\widetilde{W}(p)$ [illegible] $W(p)$ [illegible] [2]. [illegible] [2]. [illegible] Ω [illegible] $0 \le \omega < \Omega$.

[illegible] [3, 4] [illegible] $\Psi(p)$ [illegible] $w(p)$

$$\Psi(p) = \sum_{n=0}^{\infty} d_n w^n(p) = \sum_{n=0}^{N} d_n w^n(p) + \Delta_N(p)\,. \tag{3}$$

[illegible] [3, 4] [illegible]:

$$d_n = \frac{1}{2\pi j} \oint_C \frac{\Psi(z) w'(z)}{w^{n+1}(z)} dz\,. \tag{4}$$

[illegible] (4) [illegible] $\Psi(p)$ [illegible] $w(p)$ [illegible] a, [illegible] $w(p)$ [illegible] a [illegible] C, [illegible] D, [illegible] D [illegible] a, [illegible] $\overline{D} = D \bigcup C$ [illegible] $w(p)$ [illegible] $w(a) \ne 0$, [illegible] $\Psi(p)$ [illegible] $w_1(p) = w(p) - a$.

[illegible] [15]

$$\Delta_N(p) = \sum_{n=N+1}^{\infty} d_n w^n(p) = \frac{w^{N+1}(p)}{2\pi j}\oint_C \frac{\Psi(z)w'(z)dz}{w^{n+1}(z)(w(z)-W(p))}. \tag{5}$$

[illegible].

[illegible] (2). [illegible]

$$\varphi(p) = \frac{\beta(p)}{\alpha(p)}. \tag{6}$$

[illegible]

$$e^{-\varphi(p)} = \frac{M(p)}{L(p)} + \Delta_N(p), \tag{7}$$

[illegible] $\Delta_N(p)$ [illegible] (5).

[illegible] $\exp(-\varphi(p))$ [illegible] $\exp(-\varphi(p))$ [illegible].

[illegible]:

$$W_0(p) = \frac{B(p)M(p)}{A(p)L(p)}. \tag{8}$$

[illegible] [5] [illegible] $D(p) \in \mathcal{H}_m$ [illegible]

$$\Phi_0(p) = \frac{V(p)W_0(p)}{1+V(p)W_0(p)}. \tag{9}$$

[illegible] $S(p)$ [illegible] $R(p)$ [illegible]

$$B(p)S(p) + A(p)R(p) = D(p) \tag{10}$$

[illegible] [16].

[illegible] 1. ***[illegible]*** *$A(p) \in \mathcal{R}_m$* ***[illegible]*** *$B(p) \in \mathcal{R}_l$*, ***[illegible]*** *$D(p) \in \mathcal{R}_n$, $n \ge m+l$*, ***[illegible]*** *$S(p) \in \mathcal{R}_{m-1}$* ***[illegible]*** *$R(p) \in \mathcal{R}_{n-m}$*, ***[illegible]*** *(10).*

[illegible] $A(p)$ [illegible] $B(p)$, [illegible] $L(p)$ [illegible] $M(p)$.

[illegible] [5].

[illegible] 2. ***[illegible]*** *(3)* ***[illegible]***

$$n \ge m + \max\{m-1, l\}. \tag{11}$$

[illegible] 1-[illegible] (10) [illegible]:

$$B(p)M(p)S(p) + A(p)L(p)R(p)p = D(p). \tag{12}$$

[illegible], [illegible] $L(p)$ [illegible] $A(p)$ ð [illegible]

$$D(p)=A(p)L(p)D_1(p),\quad S(p)=A(p)L(p)S_1(p). \tag{13}$$

[illegible] (12) [illegible]

$$B(p)M(p)S_1(p)+R(p)p=D_1(p). \tag{14}$$

[illegible]

$$S_1(p)=\frac{D_1(0)}{B(0)M(0)} \tag{15}$$

[illegible], [illegible] $B(0)M(0)\neq 0$. [illegible].
[illegible] (2), [illegible]

$$V(p)=\frac{S(p)}{pR(p)}=\frac{A(p)L(p)D_1(0)}{D_1(p)B(0)M(0)-B(p)M(p)D_1(0)}. \tag{16}$$

[illegible]. [illegible] [4].

[illegible] 1. ***[illegible] $f(z)$ [illegible] $g(z)$ [illegible] C, [illegible] C [illegible], [illegible] C [illegible]***

$$|1+f(z)|>|g(z)-f(z)|, \tag{17}$$

[illegible] $1+f(z)$ [illegible] $1+g(z)$ [illegible] C [illegible].

[illegible] (8) [illegible] (16) [illegible], [illegible] 1 [illegible] (16) [illegible] (1) [illegible]

$$|1+V(j\omega)W_0(j\omega)|>|V(j\omega)W(j\omega)-V(j\omega)W_0(j\omega)|,\quad \omega\ge 0. \tag{18}$$

[illegible], [illegible]:

$$|D(j\omega)|>|B(j\omega)S(j\omega)||\Delta_N(j\omega)|,\quad \omega\ge 0, \tag{19}$$

[illegible], [illegible],

$$\frac{|D_1(j\omega)|}{|D_1(0)|}>\frac{|B(j\omega)|}{|B(0)M(0)|}|\Delta_N(j\omega)|,\quad \omega\ge 0. \tag{20}$$

[illegible] (3)ï(5) [illegible], [illegible] $w(p)$, [illegible] N [illegible] $D_1(p)$ [illegible] (20) [illegible].

[illegible]

1. *Richard J.-P.* Time-delay systems: An overview of some recent advances and open problems // Automatica. ð 2003. ð Vol. 39, No. 10. ð P. 1667ï1694.
2. ***[illegible]*** [illegible]. ð [illegible], 1987. ð 144 [illegible]
3. ***[illegible]*** [illegible]. ð [illegible], 1964. ð 324 c.
4. ***[illegible]*** [illegible]. ð [illegible], 1987. ð 688 c.
5. ***[illegible]*** [illegible] // [illegible]. ð 2004. ð ¯ 1. ð [illegible]. 103ï109.

[illegible] 681.537

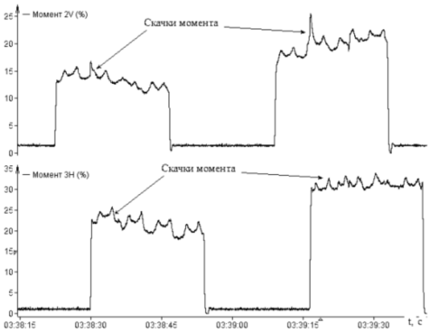
[illegible]

[illegible]

[illegible] «350». [illegible]

[illegible], fuzzy [illegible]

[illegible] 1.



[illegible] 1. [illegible]

[illegible]

[illegible] (n+1) [illegible] t_1 [illegible] (n+1) [illegible] t_2.

[illegible] 2 [illegible]

[illegible]

$$n_1 = r_{(n-1)}\left[1-\left(\frac{M(t_1)\cdot 2i_t}{D_{B1}S_{C1}} - \frac{M(t_2)\cdot 2i_t}{D_{B2}S_{C2}} - 0,5\delta_1\right)k_{E1}k_{E2}\right]n_2 r_{1(n+1)}, \qquad (1)$$

[illegible] r_{n-1} – [illegible] (n-1)- [illegible] n-[illegible];

M(t$_1$), M(t$_2$) - [illegible] t_1 [illegible] t_2;

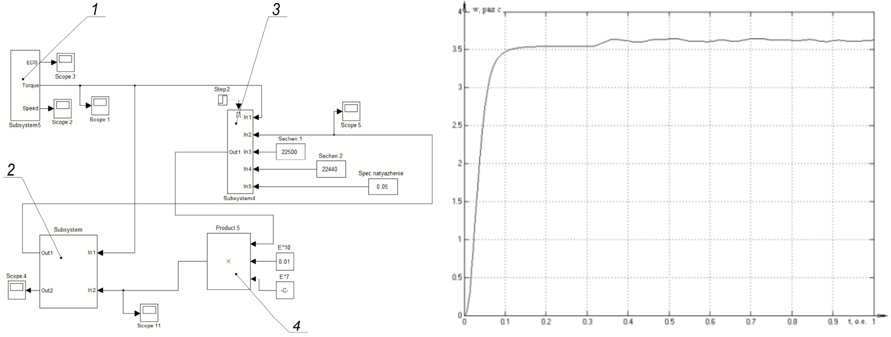
D$_{B1}$, D$_{B2}$- [illegible];

S$_{C1}$, S$_{C2}$ – [illegible];

n_2 – [illegible] (n+1)- [illegible];

$r_{1(n+1)}$ - [illegible] (n+1)-[illegible] n-[illegible].

[illegible] 2 [illegible] 1 [illegible] 2 [illegible] MatLab, [illegible]



1
3
EDS
Torque
Speed
Scope 3
Scope 2
Scope 1
Subsystem5
Step2
In1
In2
Out1 In3
In4
In5
Subsystem4
Sechen 1
22500
Sechen 2
22440
Spec natyazhenie
0.05
Scope 5
2
Subsystem
Out1
In1
Out2
In2
Scope 4
Scope 11
Product 5
E^10
0.01
E^7
-C-
4
4
3.5
3
2.5
2
1.5
1
0.5
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

[illegible] [illegible]

[illegible] 2. [illegible] n-[illegible] (n+1)- [illegible]. [illegible] (t) [illegible] (n+1)- [illegible]

[illegible] 2 [illegible]:

1, 2 - [illegible] 1 - [illegible] 2 – [illegible].

3 - [illegible]:

- [illegible].

- [illegible].

- [illegible].

4 – [illegible] (1).

[illegible] (t) [illegible] 2 [illegible]).

[illegible] 7:

1 – [illegible].

2 – [illegible].

[illegible] (fuzzy [illegible]). [illegible]

[illegible] *i*-[illegible]:

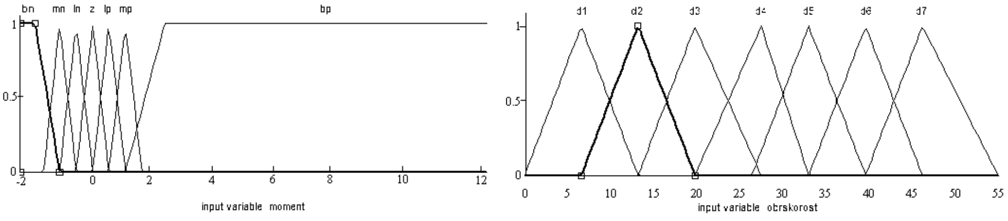
$$z_i = \frac{\int_{Min}^{Max} x \cdot moment(x)dx}{\int_{Min}^{Max} moment(x)dx} \qquad (2)$$

moment(x) – [illegible]

z_i – [illegible].

[illegible] Fuzzy logic Matlab ([illegible]).

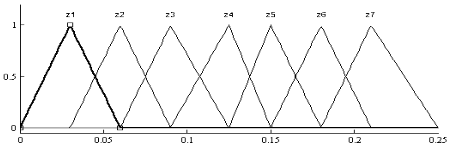
[illegible] (… 4 …) [illegible]: bn – [illegible], mn – [illegible], ln – [illegible], z – [illegible], lp – [illegible], mp – [illegible], bp – [illegible].



[illegible] 4. [illegible]

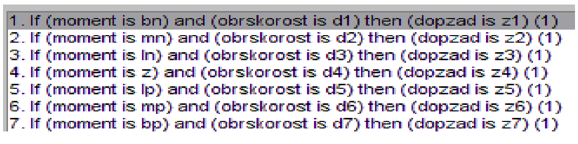
[illegible] (… 4 …) [illegible] d1- d7 [illegible].

[illegible] z1- z7 (…5) [illegible].



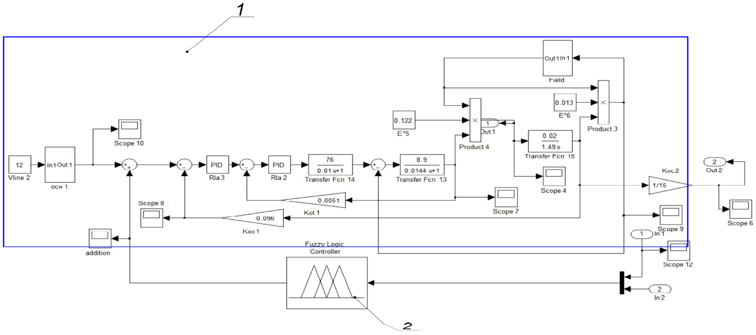
[illegible] 5. [illegible]

[illegible] (…6):



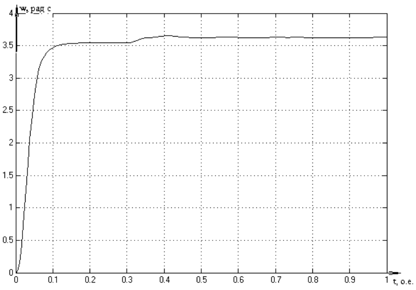
1. If (moment is bn) and (obrskorost is d1) then (dopzad is z1) (1)
2. If (moment is mn) and (obrskorost is d2) then (dopzad is z2) (1)
3. If (moment is ln) and (obrskorost is d3) then (dopzad is z3) (1)
4. If (moment is z) and (obrskorost is d4) then (dopzad is z4) (1)
5. If (moment is lp) and (obrskorost is d5) then (dopzad is z5) (1)
6. If (moment is mp) and (obrskorost is d6) then (dopzad is z6) (1)
7. If (moment is bp) and (obrskorost is d7) then (dopzad is z7) (1)

[illegible] 6. [illegible]


1
2
Out1In1
Field
0.013
E^6
Product 3
0.122
E^5
Product 4
1
Out1
0.02
1.49s
Transfer Fcn 15
12
Vline 2
In1Out1
осн 1
Scope 10
PID
Rla3
PID
Rla 2
76
0.01s+1
Transfer Fcn 14
8.9
0.0144s+1
Transfer Fcn 13
Scope 4
Kос2
1/15
2
Out 2
Scope 6
0.0051
Kot 1
0.096
Kос 1
Scope 8
Scope 7
Scope 9
1
In 1
Scope 12
addition
Fuzzy Logic Controller
2
In 2

[illegible] 7. [illegible] fuzzy [illegible].

[illegible] Fuzzy-[illegible] y (t) [illegible] (n+1)- [illegible] 8.



[illegible] 8. [illegible] y (t) [illegible] (n+1) - [illegible].

[illegible], [illegible] ([illegible]), [illegible].

[illegible]

1. [illegible] 1977,- 274 [illegible]

3. [illegible] - [illegible] 2010,-. 80 [illegible]

4. [illegible]-[illegible], 2004,- 127 [illegible]

5. [illegible] 2004. - 127 [illegible]

[illegible]

[illegible]

[illegible]

[illegible] «[illegible]»

[illegible], [illegible]. [illegible].

[illegible], [illegible] ([illegible]).

[illegible], [illegible], [illegible], [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] «PowerPoint», «AutoCAD», [illegible]

[illegible] Power Point [illegible]

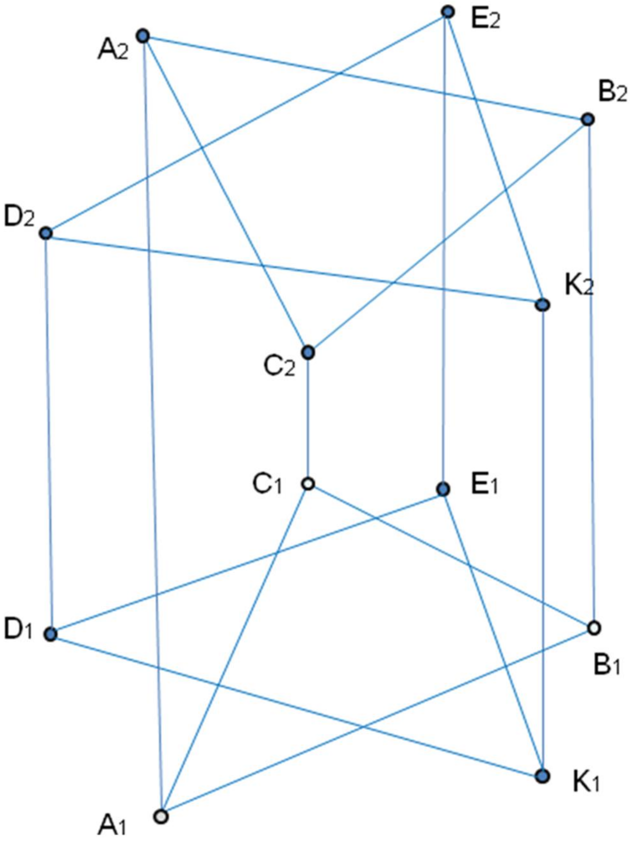
[illegible]

[illegible]

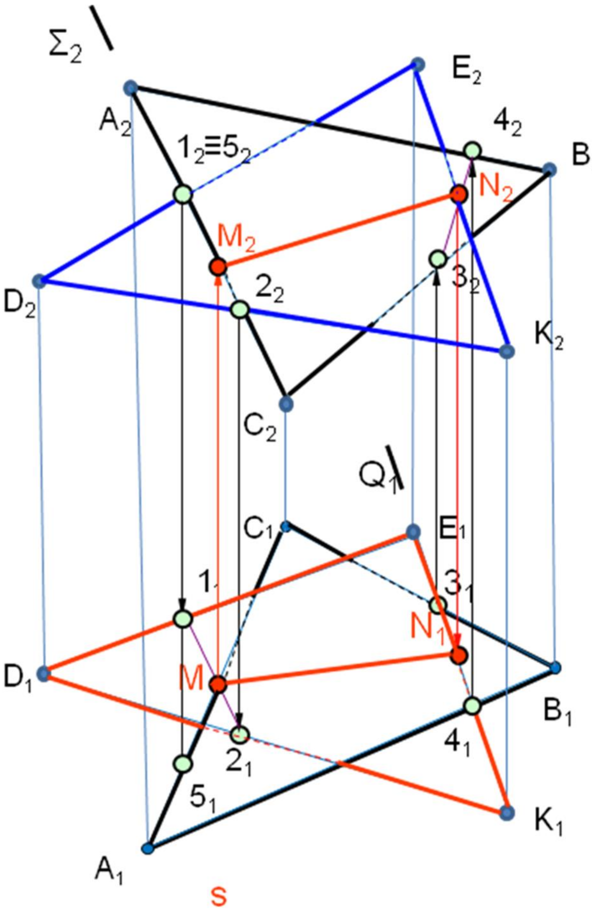
[illegible]

[illegible]

[illegible]


A2
E2
B2
D2
K2
C2
C1
E1
D1
B1
K1
A1

[illegible]1


Σ2
A2
E2
4₂
B2
1₂≡5₂
N2
M2
3₂
2₂
D2
K2
C2
Q1
C1
E1
1₁
3₁
N1
D1
M1
B1
4₁
2₁
5₁
K1
A1
s

[illegible]2

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

ɘtsʟdʒsɣ dʑsfŋs dʒ ꞊ʘdʑʃɥʝ fʃʃ꞊ tsʰ ʃʙtsʕ, ʕtslststɕ ʝ dʒsɢlzls ɘtsʟdʑʃʕʘsᴵ ʧtɕʃ tɕlzɥdʑsdʒ tɕʝʰ ʝdʑʃʃ. ɻ tɕʘ ʃʕʘ ʧtsʜtsʙtɕʘdʑʘʃ tslstɕʝ ɢlzdʑʃtɕtsɘʘdʑʘʟʘtɕʘdʝ ʝ. ɭ ʘɢdʑʜdʑsfŋs ʜtsfŋsʃɢʘ lsfŋ ɢtstɕʘʟʜts ʝʕlsʃɘdʝ ʝ.

ɼ fŋdʑʃ lz fŋslzʜʝ dʑlstsɘ ɘtsʟdʑʃʕʘ ls ɘtstʃtɕtsfŋ ɘfŋ ɢʜʘdʒsɣ dʑs ɘʝ tɕdʑlsᴵ tɕʝʰ ʝdʑʃʝ dʑʘʟʘʜ, ʧtsɘlststɕʃlsᴵ lstɕlzʜdʑ ʝ dʒʝ fŋsʘ ɘʳ ʜʝ dʑʃlsᴵ ʃ꞊ ʜtsʧtsdʑdʑʃlsʝ dʑ dʑs. ʊʘʕɣʝ dʝ dʒʘdʑsɘʘɣ dʑs, ɥlsts dʒsɣ dʑs ʜtsʧtsdʑdʑʃlsʝ dʑ dʑs ʧtɕtsʃdʑdʑ fŋstɕʃtɕtsɘʘsᴵ tɕʝʰ ʝdʑʃʝ dʑʘɢdʑʜdʑ dʒʃʟtsʙtɕʘɣʝdʑʃʝdʒ ʕtslststɕsʝ dʒsɣʝlsʙʳ lsᴵ ʧtsʟʘʃdʒfŋsɘtsɘʘdʑs ʃʟ ʃdʑsʝtɕdʝlsʘ ʃʟ dʝʕlstɕtsdʑdʑ ꞊ ʃfŋstsɥdʑʃʕtsɘ lzɥʝʙdʑs? dʑʃlsʝtɕʘlslztɕ, ʃdʑʃ ʧtsfŋstɕtsʝdʑs fŋʘdʒsfŋsts lsʝ dʑ dʑs. ɟ tɕʃ lstsdʒ dʒ fŋdʑʃlsʝ dʑ dʑʘ ʜʝ lsʝ dʑ dʑsfŋs fŋslzʜʝ dʑlstsɘ ʘʕlsʃɘdʝ ʝ ɘʕdʑ ɥʘ ls dʑsɢʃɥʝ fʃtsʝ ʃ ʧtɕtsfŋstɕʘdʑfŋsɘʝ dʑdʑsʝ dʒʰ dʝdʑʃʝ, tɕʘʟɘʃɘʘ lsfŋ ʃ ʧtsʙtɕʘʟdʑʘ ʧʘdʒlsᴵ.

ʝ lsdʝlsʃdʒ lsʘʕɣʝ, ɥlsts ɘts ɘtɕʝdʒ ʧtɕtsɘʝʜʝ dʑʃ dʑʘʙtstɕʘlststɕdʑ ꞊ ʟʘdʑlsʃ?, ɢʜʝ, ʕʘʕ ʧtɕʘɘʃdʑs, tɕʝʰ ʘ lsfŋ lsʃʧtsɘʳ ʝ ʧtɕʃdʒʝtɕ ʃʟʘʜʘɥʃ, ʧtsɘʃdʑʘfŋ ɘtsʟdʒsɣ dʑsfŋs tslsʕtɕ lsᴵ dʝʕɥʃ ʃʧtsʕʘʟʘsᴵ dʑʘ ʕtɕʘdʝ ɥʘfŋs dʝʕɥʃtsdʑdʑsɢts dʒʘsʝ tɕʃʘdʑʘ ʊ fŋdʑsɘʃ lsʃʧtsɘʳ ꞊ ʟʘʜʘɥ ʧts dʑʘɥʝtɕlsʘsʝ dʑ dʑs? ɢʝ tsdʒʝ lstɕʃʃ ʧtɕʃɘʝʜʝdʑ ɘ tɕʝʜʘʕlststɕʝ «PowerPoint», ʘ lsʘʕɣʝ ʃdʒʝ lsfŋ fŋtɕʝʜʝ «AutoCAD» ʃ «ʂ tsdʒʧʘfŋ». ʂ ʘɣʜʳ ʔ fŋslzʜʝ dʑls dʒsɣ ʝls ʧts fŋtsʝdʒlz lzfŋdʒslstɕʝ dʑʃ tɕʝʰ ʘsᴵ lsʃʧtsɘʳ ʝ ʟʘʜʘɥʃ ɘ tɕʘʙtsɥʝ ʔ lsʝ lstɕʘʜʃ ʃdʑʃ fŋʃfŋʧtsdʑ ʟtsɘʘdʑʃʝ dʒ ʕtsdʒʧ lsʝ tɕʘ

ɭ ʘ ɘʟɢdʑʜ ʘlststɕtsɘ ɘfŋ ɘʳ ʰ ʝfʃʘʟʘdʑdʑsʝ dʑʘʧtɕʘɘdʝ dʑs dʑʘ tɕʘʟɘʃlsʃʝ ʃ fŋsɘʝtɕ ʝdʑfŋsɘtsɘʘdʑʃʝ ɢtɕʘʃɥʝ fʃʃ꞊ fŋʧtsfŋsʙdʑsfŋsʝ ʔ fŋslzʜʝ dʑlstsɘ: ɢdʑʘʟtsdʒʝtɕ, ʟtɕʃlsʝ dʑ dʑsʝ ɘtsfŋʧtɕʃlsʃʝ, ʧtɕtsfŋstɕʘdʑfŋsɘʝ dʑdʑsʝ ɘtstsʙtɕʘɣʝdʑʃʝ, dʑʘɢdʑʜdʑs-tsʙtɕʘʟdʑsʝ ʃ ʕtsdʑtɕʝlsdʑs-dʑsɢʃɥʝ fʃtsʝ dʒʰ dʝdʑʃʝ, ʙʝʟ ʕtslststɕ ꞊ dʝ dʒ fŋdʑʃdʒs dʑʃʕʘʕtsʝ lsɘtstɕɥʝ fŋsɘts.

ɭ fŋtsᴵ tsɥʝtɕʝʜᴵ ʕtsdʒʧdʝʕfŋ fŋʧtsfŋsʙdʑsfŋsʝ ʔ, tɕʘʟɘʃɘʘ ʰ ʃ꞊fŋ ʃ fŋsɘʝtɕ ʝdʑfŋsɘlz ʰ ʃ꞊fŋ ɘ ʧtɕtsɥʝ fŋfŋ ɢtɕʘʃɥʝ fʃts? ʜʝ lsʝ dʑ dʑsfŋsʃ, ʧtɕʃtsʙtɕʝlsʘ ls fŋlzʰ ʝfŋsɘʝ dʑdʑsʝ ʟdʑʘɥʝdʑʃʝ ʧtɕʃ ɘʳ ʧtsdʑdʝdʑʃʃ dʑ ʙts? lsɘtstɕɥʝ fʃts? tɕʘʙtslsᴵ, ʙlzʜᴵ lsts lzɥʝʙdʑʘ, ʃdʑʃ ʕtsdʑtɕʝlsdʑʘ ʧtɕtsʃʟɘtsʜfŋsɘʝ dʑdʑʘ ʟʘʜʘɥʘ ʕtslststɕlz ʧtɕʃʜʝ lsfŋ tɕʝʰ ʘsᴵ dʑʘ ʃdʒ ɘʳ ʧlzfʃdʑʃʕʘdʒ dʑʘ ʧtɕtsls ɣʝdʑʃʃ ɘfŋ? ʧtsfŋdʝʜlz ʰ ʝ? ʜʝ lsʝ dʑ dʑsfŋsʃ.

ʉ tsɘʝtɕ ʝdʑfŋsɘtsɘʘsᴵ dʒʝlstsʜʃʕlz ʧtɕʝʜfŋsʘdʝdʑʃ ɢtɕʘʃɥʝ fʃtsɢts dʒʘsʝ tɕʃʘdʑʘ dʑʘdʝ ʕɥʃtsdʑdʑ ꞊ ʃ dʑʘʙtstɕʘlststɕdʑ ꞊ ʟʘdʑlsʃ꞊ dʒsɣ dʑs ʜts ʙʝfʃtsdʝɥdʑsfŋsʃ. ɭ ʘ ɘʟɢdʑʜ ʘlststɕtsɘ ʃfŋʧtsdʑ ʟtsɘʘdʑʃʝ ʃdʑdʑsɘʘɥʃtsdʑdʑ ꞊ lsʝ ꞊dʑsdʑsɢʃ? ʧtsʟɘtsdʑʝls ɢdʑlzʙɣʝ tɕʘfʃtɕ lsᴵ ɢtɕʘʃɥʝ fʃʃʝ fŋʧtsfŋsʙdʑsfŋsʃ fŋslzʜʝ dʑlstsɘ, ʘʕlsʃɘdʝ ʝ tɕʘʟɘʃɘʘsᴵ ʃ꞊ dʒ fŋdʑʃlsʝ dʑ dʑ ʝ fŋʧtsfŋsʙdʑsfŋsʃ ʃ ɘ ʕtsdʝɥdʑsdʒ ʃlstsɢʝ ʧtsɘʳ fŋʃlsᴵ ʕtsdʑlztɕʝ dʑlstsfŋʧtsfŋsʙdʑsfŋs dʑʘ ʃ꞊ ɘʳ ʧlzfʃdʑʃʕtsɘ dʑʘtɕ dʑʝ lstɕlzʜʘ

ɟ ʈʃ ʃʃ ɼʃ ʒ ʈɸʉɟʃ ɭɭ ɸɭɸɭ ʀɕ ʈɼʏʀ

ɻ tsdʑsɘɥʝ dʑts ɸ.ʃ.

ʉ ls ʘtɕtsfʃtsdʑ fʃʃ? lsʝ ꞊dʑsdʑsɢʃɥʝ fʃʃ? ʃdʑfŋs ʃlslzls ʃdʒ ɸ.ɸ. ʊ ɢʘtɕtsɘʘ (ʃdʑʃʘ) ʌ ɸɥʃ ʊ ɭɟ ʃ ɭ ʀʊʊ "ʃ ʀ ʉʃʉ", ʉ ls ʘtɕ ʔ ʃ fʃtsdʑ ʈ tsfŋ

ɭ ʧʝtɕɘʳ ʝ ʧtsʧʳ lsʕʃ tɕʘfŋʧtsʟdʑʘʘdʑʃ ɢtsdʑsfŋʘtslsdʑsfŋ lsfŋ ʕ dʑʘɥʘdʑ 50-꞊ ɢtsʜtsɘ ʧtɕtsʰ dʑsɢts ɘʝʕʘ ɭ ʘʧtɕʃdʒʝtɕ - ʧʝtɕtsʝ lzfŋstɕts? fŋsɘts tɕʘfŋʧtsʟdʑʘʘdʑʃ ɥʃtɕʙʳ dʑs ʧtɕʝʜfŋsʘdʝ dʑs ɘ ʜʘdʝ ʕtsdʒ 1952 ɢtsʜlz. ɭ ts dʑʘɥʘdʑs ʕtsdʒdʝ tɕɥʝ fʃtsɢts tɕʘʟɘʃlsʃ fŋʃfŋsʝ dʒɢtsdʑsfŋsɘtsɢts lzʧtɕʘdʝ dʑʃ dʑʘɥʘdʑsfŋ ɘ 1990 ɢtsʜʳ, ʃ dʑʘ ʜʘdʑdʑ ʔ dʒsdʝ dʑls ʧtsfŋsts dʑdʑs tɕʘʟɘʃɘʘ lsfŋ.

ʈ ʘfŋfŋdʒslstɕʃdʒʕdʑʘfŋfŋ ʃʕʘɥʃ fŋʃfŋsʝ dʒ tɕʘfŋʧtsʟdʑʘʘdʑʃ tɕʝ ɥʃ:

- ʈ ʘʟdʒʝ tɕ fŋdʑsɘʘtɕ (ʕtsdʑʃɥʝ fŋsɘts tɕʘfŋʧtsʟdʑʘʘ ʝdʒ ꞊ fŋdʑsɘ);
- ɼ ʃʕlststɕtsʟʘʃfŋʃdʒʘ ʃ dʝʟʘʃfŋʃdʒʘ tɕʝɥ;
- ʈ ʘʟʜʝ dʑ dʑʘ ʃdʑʃ fŋdʑʃlsdʑʘ tɕʝɥ;
- ʎ ʝ dʑ tɕʘfŋʧtsʟdʑʘʘdʑʃ (dʑʘʙtstɕ lsʝ ʕfŋsʘ ɢtsdʑsfŋsɘtsʝ lzʧtɕʘdʝ dʑʃʝ);

ʝ fŋsʘdʑsɘʃdʒfŋ dʑʘ lsʃ꞊ ʘfŋʧʝ ʕlsʘ ʙtsdʝ ʝ ʧtsʜtɕtsʙdʑs. ʃ ɥʝ ɘʃʜdʑs, ɥlsts ʧtɕʃ ʜtsfŋsʘlstsɥdʑs dʒʘdʑsdʒ ʕtsdʑʃɥʝ fŋsɘʝ tɕʘfŋʧtsʟdʑʘʘ ʝdʒ ꞊ fŋdʑsɘ ʕʘɥʝ fŋsɘts tɕʘfŋʧtsʟdʑʘʘdʑʃ ʙlzʜʝls tsɥʝdʑ ɘʳ fŋsʕʃdʒ ʈʝɥʝ ɘts? ʘlstsdʒʘs 1952 ɢtsʜʘ tɕʘfŋʧtsʟdʑʘʘdʑ ʜʃʕlslzʝdʒ ʝ ʧts lsʝ dʝ tsdʑ ɥʃtɕ ʧtɕʘʕlsʃɥʝ fʃʃ fŋs 100% ɘʝtɕts lsdʑsfŋs. ɭ ts ʝ fŋdʑʃ fŋʃdʑ dʑs lzɘʝ dʑʃɥʃlsᴵ tɕʘʟdʒʝtɕ fŋdʑsɘʘtɕ, ʕʘɥʝ fŋsɘts, dʝ fŋsdʒdʝ dʑdʑs, fŋʃdʑ dʑs ʧʘʜʘ ls ʃ dʑʘʧtɕdʒlz dʑʘɥʃdʑʘ ls ʟʘʃfŋ lsᴵ tsls ʧtɕʃdʒʝ dʑʝ dʒ ꞊ ʘdʑʕtstɕʃlsdʒsɘ. ɭ ʘ fŋsɘtɕʝ dʒʝ dʑdʑsdʒ lsʘʧʝ ʧtɕʃ fŋdʑsɘʘtɕʝ ʧtstɕʜʕʘ dʝ fʃtsdʑ ʕʃ꞊ ls fŋɥ fŋdʑsɘ ʕʘɥʝ fŋsɘts tɕʘfŋʧtsʟdʑʘʘdʑʃ dʝ ʧtɕʝɘʳ ʰ ʘ ls 70-75%.

[illegible] (... [illegible]).

[illegible] 1913 [illegible].

1. [illegible]

2. [illegible] ([illegible]) [illegible].

[illegible].

[illegible]

1. [illegible] AudiTech Ltd. ([illegible])
2. [illegible] 2000. [illegible] IV [illegible] "[illegible]",
3. [illegible], 2003. [illegible] XIII [illegible].
4. [illegible], 2008 [illegible].
5. [illegible] 2006. [illegible]
6. [illegible], 2004, [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] 70-80% [illegible] 80-160 [illegible].

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. [illegible] 1999. [illegible] 386 [illegible]

2. [illegible] 2011. [illegible] 569 [illegible]

ʃ ɸʊɽʃ ɸʊʀʏɽʉʂ ɸɕ ʃ ʃ ɼɽʃ ʔ ʇ ʈʃ ʎɽʉʉɸ ʕʂ ʉʊʈ ɸʂ ʎʀʀ ʌʃ ʉʌʃ ʈʅʃ ʙ
ʂʀʉʃʃ ʊʒ ɼʃɕ ʇʃ ɪʒ ʑ ɽʅʀɕ ʕʌʌɽʂ ʊʀɪʅʃ ʉʊʀ ʂʃʅ ʊʈʃ ʃɕ ʀ ʋʇ ʈɸɪʃɽʅʀɕ

ɹ ʘʙʝ ʤ ʦɘ ɹ.ɸ.

ʉ ls ʘʦʦʄʦʤ ʄʕʔ lsʝ ʢʤʦʤʦʛʄʮʝ ʄʕʔ ʤʄʄls ʤʝ ʤʄ ɸ.ɸ.ʋ ɢʘʦɘʘ(ʬ ʤʄʘʤ) ʅ ʀ ʊʋ ʃ ʀ ʉʤʉ,
ʉ ls ʘʦ ʔʃ ʄʦʤ, ʈ ʦʄʄʄʷ

ʕʕʄʦʘʕʮʤʦʤʘʸ ʬʦʄʬʦʦʤʘʸ ʕʤʄʤʦlsʘ(ʕʌʂ) ʷɘʤʝlsʄʸ ʦʜʤʤʒʤʟ ʦʄʤʦɘʤ ʢ ɘʤʜʦɘ ʄʝ ʦʷ ɘ ʧʦʦʤʟɘʦʜʄɘʝ ʤʒʤʤʦʘʤ ʤ ʢ ʟʜʦʙʦʝʤʔ, ʧʦʤʟʁ ʰ ʤʒʄʸ ɘʳ ʄʕʤʒʄʧʦʄʤʒ ʕʘʕ ɘ ʈʦʄʄʤ, lsʘʕ ʤʟʘʦʤʙʝʞʦʤʒ ʇ ʦʦʮʝʄʄʧʦʤʤʮʝʤʷ ʕʌʂ ʄʦʄʦʤls ʤʟ ʜɘʟʢ ɘʟʘʤʒʄʘʷʟʘʤʤ ʢ ʄʘʜʤʔ [1]:

1) ɘ ʜɘʟʢʦʝ ʘʕlsʦʦʤʦʤʒ lsʝ ʢʤʦʤʦʛʄʮʝ ʄʕʦʤʒ ʘʦʝ ɢʘʝ (ʇʕʄʦʘʕlsʦʦʝ) ʧʦʦʤʄʢʦʜʤls ʦʘʟʤʦʞʝʤʝ ʘʧʘʤlsʦɘʦɢʦ ʕʦʤʝʤʦʘʘ ʄʝʦʤʦʔ ʕʤʄʤʦlsʦʔ ʄʦʙʦʘʟʦɘʘʤʝʤʒ ʬʦʄʬʦʦʤʦʔ ʕʤʄʤʦlsʳ ʤlsɘʝʦʜʦɢʦ ɘʝʰ ʝʄʘʏ ʧʦʤʤɢʤʜʦʘlsʘʄʟʤ ʬʘʘʕʘʤ ʮʤʷ (ʬʦʄʦʧʦʤʤɢʤʜʦʘlsʘ);

2) ʤʘ ʬʤʤlsʦʝ ʦʄʟʰ ʝʄʘʤʝlsʄʸ ʦlsʜʝʤʝʤʝ ʧʦʦʜʟʕʮʤʦʤʦʔ ʕʤʄʤʦlsʳ ʦls ʦʄʘʜʕʘ ʇ ʦʤ ʇlsʦʤʒ ʮʘʄʳ ʕʤʄʤʦlsʳ ʦlsʧʦʘɘʤʝlsʄʸ ʤʘ ʄʕʤʘʜ, ʘʦʄʘʤ ʤʘʸ ʮʘʄʳ ɘʦʟɘʦʘ ʘlsʄʸ ɘ ʇʕʄʦʘʕlsʦʦ ʄʝ ʦʘʄʘʦʦʦʒʦʘʟʙʘʤʝʤʷ.

ʕʕʄʦʘʕʮʤʷ ʬʦʄʬʦʦʤʦʔ ʕʤʄʤʦlsʳ ʷɘʤʝlsʄʸ ʄʤʦʏʤʒ ʢʤʤʕʦ-lsʝ ʢʤʦʤʦʛʄʮʝ ʄʕʤʒ ʧʦʦʮʝʄʄʤʒ(ʌʊʇ), ʢʘʦʘʕlsʝʦʟʁ ʰ ʤʒʄʸ ʄʤʜʁ ʰ ʤʒʤ ʦʄʙʝʤʤʄʷʤʒ:

- ʧʦʦʮʝʄʄʷɘʤʝlsʄʸ ʤʧʦʝʦ ɘʤ ʤʒ

- ʦʙʦʘʟʦɘʘʤʝ ʤ ʦʦʄʕʦʄʘʤʦɘ ʧʦʤʤɢʤʜʦʘlsʘʄʟʤ ʬʘʘʕʘʤ ʮʤʷ ɘ ʦʝʘʕʮʤʦʤʦʔ ʧʟʤʧʝ ʧʦʤɘʦʜʤls ʕ ʦʙʦʘʟʦɘʘʤʁ ʦlsʤʦʏʝʤʔ ɘ ʦʘʄʢʦʜʦʤʝʦʘʕ, ʮlsʦ ʧʦʤɘʦʜʤls ʕ ʧʦʷɘʤʝʤʁ ʄʄʄʝʤʒʘʤʮʝʄʕʤʢ ʧʦɢʦʝʰ ʤʦʄʝʔ ɘ ʦʝʟʤʤlsʘlsʘʕʢ ʤʟʤʝʦʝʤʷ ʦʘʄʢʦʜʘ ʧʟʤʧʳ ʤʘ ʬʤʤlsʦ ʤ ʦʘʄʢʦʜʘʦʘʄɘʦʘʦʘʟʙʘʤʝʤʷ;

- ʧʦʦʮʝʄʄʤʤʝ ls ɘʳ ʄʕʟʁ ʮʟɘʄʄɘʤlsʝʤ ʤʦʄʄʳ ʕ ʄʄʄʘɘʟ ʬʦʄʬʘʤʦɢʦ ʄʝ ʦʷ ʤ lsʦʮʤʦʄʄʤ ʄʙʤ ʜʝʤʷ ʦʝ ɢʤʘʝ ʤʤʦɢʦ ʦʝʏʤʒ

- ʧʦʦʮʝʄʄ ʷɘʤʝlsʄʸ ʄʤʤ ʤʦ ʤʝʦʮʦʤʤ ʤʒ (ɘʦʝʤʒʷ ʧʝʦʝʢʦʜʤʦɢʦ ʧʦʦʮʝʄʘ ʄʘʳ ʰ ʝ 10 ʮʘʄʄɘ);

- ɘ ʄʘʷʟʤ ʄʦʦlsʄʟlsʄʄɘʤʝʤʒ ʄʝʝʜʄɘ ʘlsʦʤʒʘʤʮʝʄʕʦɢʦ ʕʦʤʦʦʤʷ ʄʄʄʘʘʘʧʟʤʧʳ ʤʟʤʝʦʝʤʷ ʢʘʦʘʕlsʝʦʄʄʤʕ ʧʟʤʧʳ ʧʦʦʤʄʢʦʜʤls ɘ ʦʝʟʤʤlsʘʝ ʤʘʙʦʦʘʦʦʤʦɢʦ ʘʤʘʤʤʟʘ ʧʦʦɘʦʜʤʦɢʦ 1 ʦʘ ɘ 2 ʮʘʄʘ

ʃ ʄʤʦɘʤ ʤʤ ʧʦʕʘʟʘʝʤʤ ʇʬʬʝʕlsʤɘʤʦʄʤ lsʝ ʢʤʦʤʦʛʄʮʝ ʄʕʦɢʦ ʧʦʦʮʝʄʄʘ ʧʦʦʤʟɘʦʜʄʘʘ ʬʦʄʬʦʦʤʦʔ ʕʤʄʤʦlsʳ ʷɘʤʁ lsʄʸ:

- ʕʦʇʬʬʤʮʤʝʤʤ $\S_{ʈɸʅ}$ ʦʘʤʦʞʝʤʷ ʘʧʘʤlsʘɘ ʇʕʄʦʘʕlsʦʦʝ;

- ʕʦʇʬʬʤʮʤʝʤʤ $\S_{ʃʊʃ}$ ʦlsʤʒ ɘʕʤ ʬʦʄʦʧʦʤʤɢʤʜʦʘlsʘʤʘʬʤʤlsʦʝ;

- ʕʦʇʬʬʤʮʤʝʤʤ $\S_{ɪʒʌ}$ ɘʳ ʢʦʜʘʬ ʦʄʬʦʦʤʦʤɢʦ ʘʤɢʤʜʦʤlsʘʤʟ ʄʝ ʦʷ

$\S_{ɪʒʌ} = \S_{ʈɸʅ} \times \S_{ʃʊʃ}$.

ɼ ʤ ʟʄʝʰ ʤʦɢʦ ʧʦʦlsʝʕʘʤʷ ʦʝʘʕʮʤʔ ʦʘʤʦʞʝʤʷ ʘʧʘʤlsʘ ʤ ʬʦʦʤʒʤʦʦɘʘʤʷ ʤʟʦʧʝʦʤʒlsʦʤʮʝʄʕʤʢ ʕʦʤʄʘʤʤʦɘ ʬʦʄʬʦʦʤʦʧʦʤʤɢʤʜʦʘls, ʄʝʦʄʦʄʙʄʄɘʟʁ ʰ ʤʢ ʧʦɘʳ ʰ ʝʤʁ $\S_{ɪʒʌ}$, ɘ ʇʕʄʦʘʕlsʦʦʝ ʤʝʦʙʢʦʜʤʒʦ ʕʦʤʦʦʦʤʤʦɘʘʘʤ ʤ ʄʘʙʤʤʟʤʦɘʘʘʤ ʄʤʝʜʁ ʰ ʤʝ lsʝ ʢʤʦʤʦʛʄʮʝ ʄʕʤʝ ʧʘʦʘʤʒlsʦ :

- C^1_{SO3} ï ʕʦʤʝʤʦʘʮʤʷ SO_3 ɘ ʏʤʜʕʦʔ ʬʘʝ ʧʟʤʧʳ 1-ɢʦ ʦʝ ʘʕlsʦʦʘ [ɢ/ʜʒ^3];

- C^2_{SO3} ï ʕʦʤʝʤʦʘʮʤʷ SO_3 ɘ ʏʤʜʕʦʔ ʬʘʝ ʧʟʤʧʳ 2-ɢʦ ʦʝ ʘʕlsʦʦʘ [ɢ/ʜʒ^3];

- $C_{ʈ2ʃ5}$ ï ʕʦʤʝʤʦʘʮʤʷ $ʈ_2ʃ_5$ ɘ ʏʤʜʕʦʔ ʬʘʝ ʧʟʤʧʳ 1-ɢʦ ʦʝ ʘʕlsʦʦʘ [%];

- $ʉ_{ʊɪ}$ ï ʕʦʤʝʤʦʘʮʤʷ lsʝʦʜʦʔ ʬʘʳ ɘ ʧʟʤʧʝ 1-ɢʦ ʦʝ ʘʕlsʦʦʘ [%];

- ʅ ï ʟʦʦɘʝʤ ʧʟʤʧʳ ʦls ʕʦ ʰ ʕʤ 1-ɢʦ ʦʝ ʘʕlsʦʦʘ [ʤ];

- $T_{ʅʋʃ}$ ï lsʝʤʧʝʦʘʤʟʦʘ ʧʟʤʧʳ ɘ 1-ʤ ʦʝ ʘʕlsʦʦʝ, [°C].

ʊʝʤʧʝ ʦʘʤʟʦʘ ʤ ʟʦʦɘʝʤ ʧʟʤʧʳ ɘ ʇʕʄʦʘʕlsʦʦʝ ʤʟʤʝʦʘʁ lsʄʸ ʤʧʦʝʦ ɘʤʦ, ʦʄʄʘʤʤ ʝ ʧʘʦʘʤʒlsʦ ʦʧʦʝ ʜʝʤʁ lsʄʸ ɘ ʦʝ ʟʤʤlsʘʝ ʇʕʄʧʦʝ ʄʄʄʘʦʘʦʤʟʘ1 ʦʘ ɘ 2 ʮʘʄʘ

ʈʝ ɢʤʤʦʦʘɘʘʦʤʝ lsʝʤʧʝ ʦʘʤʟʦʤ ʧʟʤʧʳ ʦʄʟʰ ʝʄʘʤʝlsʄʸ ɘ ʘlsʦʤʒʘʤʮʝʄʕʤʒ ʦʝʏʤʒ ʧʟlsʝʤ ʤʟʤʝʦʝʤʷ ʦʘʄʢʦʜʘ ɘʦʟʜʟʢʘ ʧʦʦʕʘʮɘʘ ʤʒɢʦ ʮʝʟ ʘʧʧʘʦʘ ɘʦʟʜʟʰ ʤʦɢʦ ʦʢʤʘʅʜʝʤʷ.
ʈʝ ɢʤʤʦʦʘɘʘʦʤʝ ʦʄʄʘʤʤ ʢ ʧʘʦʘʤʒlsʦɘ ʧʦʦʮʝʄʄʘ ʇʕʄʦʘʕʮʤʤ ʧʦʦʤʄʢʦʜʤls ɘ ʦʝʟʤʤlsʘʝ ʤʟʤʝʦʝʤʷ ʦʘʄʢʦʜʦɘ ʧʦ ʰ ʝʄʤʒʘʝ ʦʘʄʘʤ ʤʒʧʦlsʦʕʘʤʒ

- $F_{\phi 1}$ - [illegible], [illegible];
- F^1_{H2SO4} - H_2SO_4 [illegible] 1-[illegible] [illegible], [$[illegible]^3$/[illegible]];
- F^2_{H2SO4} - H_2SO_4 [illegible] 2-[illegible] [illegible], [$[illegible]^3$/[illegible]];
- F_{ARf} – [illegible], [$[illegible]^3$/[illegible]];
- F_{1tff} – [illegible] [$[illegible]^3$/[illegible]];
- F_{1tfr} – [illegible], [$[illegible]^3$/[illegible]].

[illegible]:

- [illegible];

- [illegible].

[illegible].

[illegible].

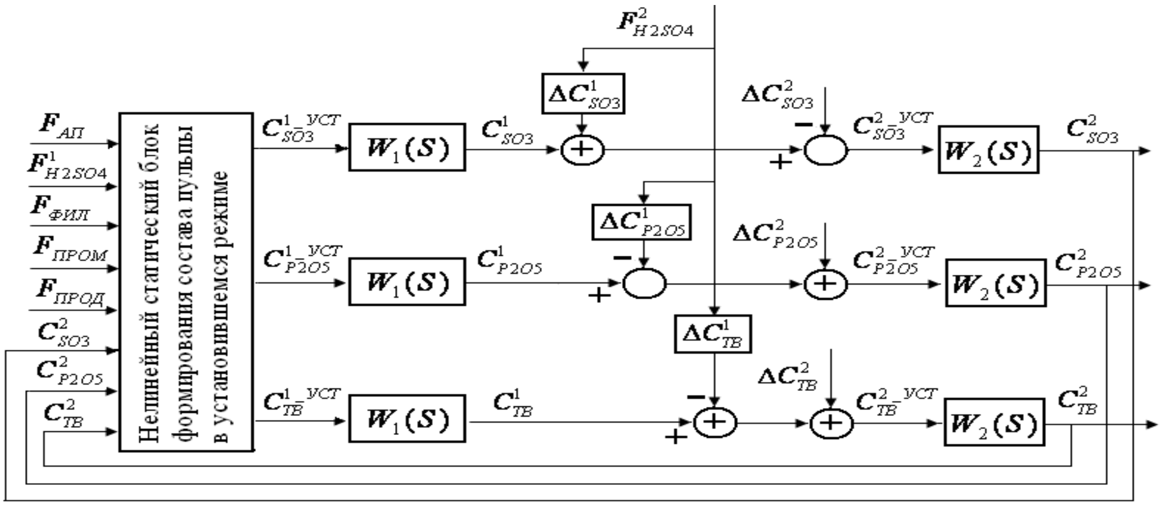
[illegible].

[illegible] -3,4 [illegible] «[illegible]» [2].

[illegible].

[illegible].

[illegible].



F^2_{H2SO4}
ΔC^1_{SO3}
ΔC^2_{SO3}
$F_{АП}$
F^1_{H2SO4}
$F_{ФИЛ}$
$F_{ПРОМ}$
$F_{ПРОД}$
C^2_{SO3}
C^2_{P2O5}
C^2_{TB}
Нелинейный статический блок формирования состава пульпы в установившемся режиме
$C^{1\_УСТ}_{SO3}$
$W_1(S)$
C^1_{SO3}
$C^{2\_УСТ}_{SO3}$
$W_2(S)$
C^2_{SO3}
ΔC^1_{P2O5}
ΔC^2_{P2O5}
$C^{1\_УСТ}_{P2O5}$
C^1_{P2O5}
$C^{2\_УСТ}_{P2O5}$
C^2_{P2O5}
ΔC^1_{TB}
ΔC^2_{TB}
$C^{1\_УСТ}_{TB}$
C^1_{TB}
$C^{2\_УСТ}_{TB}$
C^2_{TB}

[illegible] 1. [illegible]

[illegible] $W_1(s)$ [illegible] $W_2(s)$ [illegible]

[illegible] 1-[illegible]

$$W_1(S) = \frac{1}{T_1 \cdot S + 1}; \quad T_1 = \frac{V_1}{F^1}$$, (1)

[illegible] T_1 ≈ 1,5 [illegible] V_1 ≈ 450 $м^3$ [illegible] 1-[illegible] F^1 ≈ 300 $м^3$/[illegible]

[illegible] $W_2(S)$, [illegible] τ ≈ 0,68 [illegible] 2-[illegible]

$$W_2(S) = \frac{1}{(T_2 \cdot S + 1)^2} e^{-\tau \cdot S}$$, (2)

[illegible] T_2 = 0,4 [illegible]

[illegible] 1-[illegible]

[illegible]

$$W_3(S) = \frac{K}{S}$$, (3)

[illegible] $K = -\frac{1}{S} = -\frac{1}{251} 1/м^2$ - [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] « [illegible] -3,4 [illegible]» [3]. [illegible] P_2O_5 [illegible].

[illegible]

1. [illegible] 1981. 221 [illegible]

2. [illegible] 2013, [illegible] 7, [illegible]. 24-29

3. [illegible] // European Researcher. 2013, [illegible]. 40, [illegible] 2-1, [illegible]. 253-258.

[illegible]

[illegible]

[illegible] 20 [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] MMPI [illegible] 20% [illegible]);

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] Forex [illegible] [2,3] [illegible]

[illegible] Forex. «[illegible]», [illegible] Forex [illegible]

[illegible] [1].

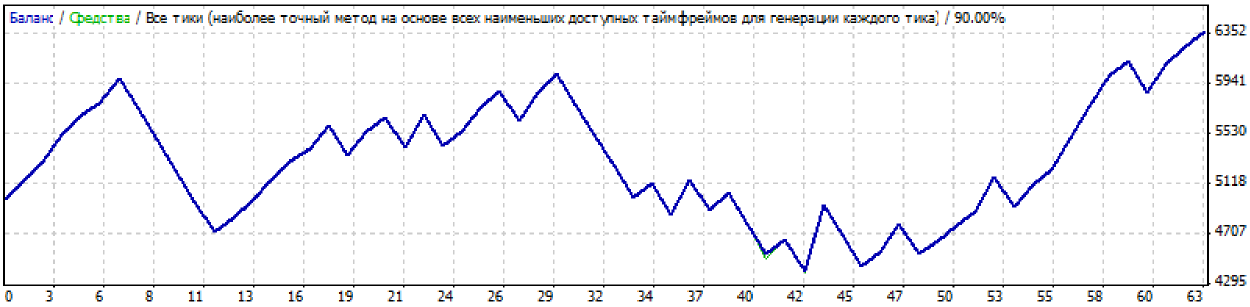
[illegible] MetaTrader 4. MetaTrader 4 ї [illegible] IDE [illegible] MQL 4.

MQL 4 (Meta Quotes Language 4) ї [illegible] MetaTrader 4, [illegible]

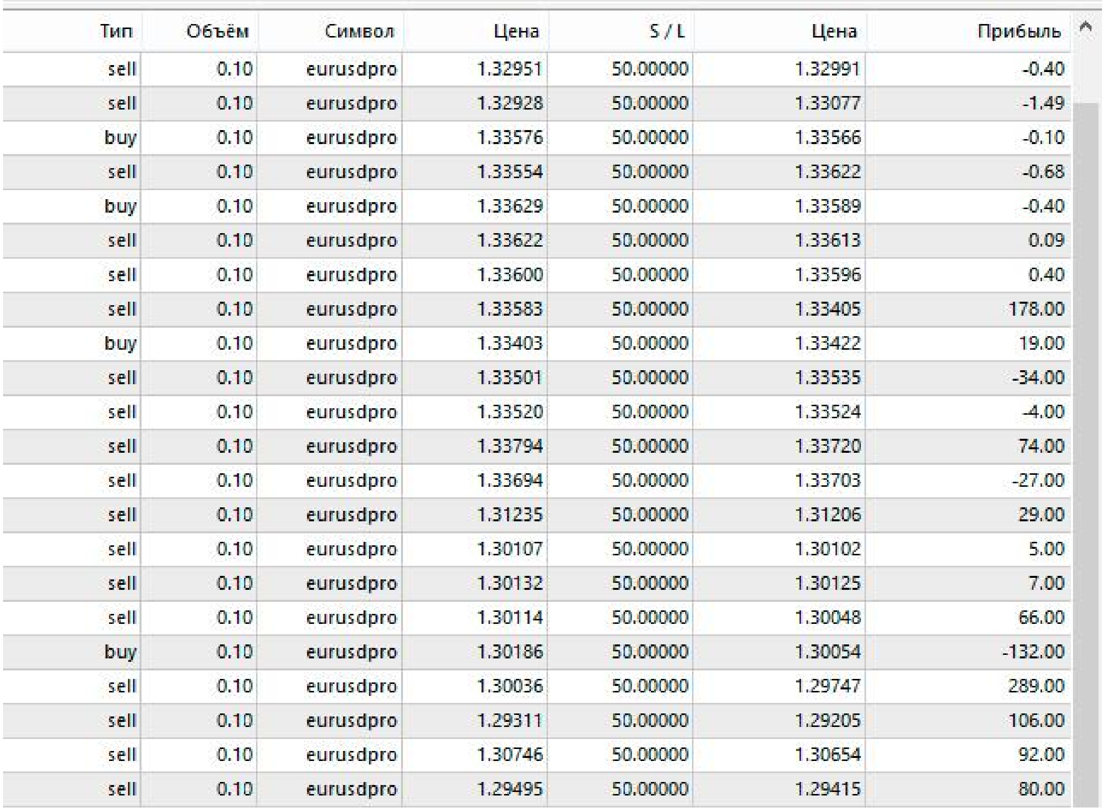
[illegible] SSA-[illegible] [1].

[illegible] N [illegible] N [illegible] MetaTrader4 [illegible]

[illegible] ([illegible] 1). [illegible] EURUSD [illegible] 2012 [illegible]



[illegible] 1 [illegible]



Тип	Объём	Символ	Цена	S / L	Цена	Прибыль
sell	0.10	eurusdpro	1.32951	50.00000	1.32991	-0.40
sell	0.10	eurusdpro	1.32928	50.00000	1.33077	-1.49
buy	0.10	eurusdpro	1.33576	50.00000	1.33566	-0.10
sell	0.10	eurusdpro	1.33554	50.00000	1.33622	-0.68
buy	0.10	eurusdpro	1.33629	50.00000	1.33589	-0.40
sell	0.10	eurusdpro	1.33622	50.00000	1.33613	0.09
sell	0.10	eurusdpro	1.33600	50.00000	1.33596	0.40
sell	0.10	eurusdpro	1.33583	50.00000	1.33405	178.00
buy	0.10	eurusdpro	1.33403	50.00000	1.33422	19.00
sell	0.10	eurusdpro	1.33501	50.00000	1.33535	-34.00
sell	0.10	eurusdpro	1.33520	50.00000	1.33524	-4.00
sell	0.10	eurusdpro	1.33794	50.00000	1.33720	74.00
sell	0.10	eurusdpro	1.33694	50.00000	1.33703	-27.00
sell	0.10	eurusdpro	1.31235	50.00000	1.31206	29.00
sell	0.10	eurusdpro	1.30107	50.00000	1.30102	5.00
sell	0.10	eurusdpro	1.30132	50.00000	1.30125	7.00
sell	0.10	eurusdpro	1.30114	50.00000	1.30048	66.00
buy	0.10	eurusdpro	1.30186	50.00000	1.30054	-132.00
sell	0.10	eurusdpro	1.30036	50.00000	1.29747	289.00
sell	0.10	eurusdpro	1.29311	50.00000	1.29205	106.00
sell	0.10	eurusdpro	1.30746	50.00000	1.30654	92.00
sell	0.10	eurusdpro	1.29495	50.00000	1.29415	80.00

[illegible] 2. [illegible]

[illegible] 2, [illegible] (sell), [illegible] (buy) [illegible] Stop Loss [illegible] Take Profit [illegible] 50 [illegible] 5, [illegible] 5000$ [illegible] 6352$, [illegible] 0.10. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. [illegible] «[illegible]»-SSA: [illegible] 2004. [illegible] 76 [illegible]
2. [illegible] 2010. [illegible] 1. [illegible] 48-54.
3. [illegible] 2011. - [illegible] II. [illegible] 199-202

[illegible] 12-07-00252-[illegible] 13-08-00532 [illegible]

[illegible]

[illegible]

[illegible]

[illegible] 15 [illegible] 75% [illegible] -50^0[illegible] $+50^0$[illegible] 3 [illegible] 6, [illegible] 8 [illegible]

[illegible] $+20^0$[illegible] $+5^0$[illegible] 2-5 [illegible] 9%, [illegible]

[illegible]:

- [illegible]
- [illegible]
- [illegible]

[illegible]

[illegible] [1]:

[illegible]

[illegible]:

$$\frac{\partial T}{\partial \tau} + \theta_m \cdot \frac{\partial T(\tau,r,\varphi)}{\partial \varphi} = \frac{1}{c \cdot \rho} \cdot \left\{ \frac{\partial}{\partial r}\left(\lambda \frac{\partial T}{\partial r} \right) + \frac{1}{r^2} \cdot \frac{\partial}{\partial \varphi}\left(\lambda \cdot \frac{\partial T}{\partial \varphi} \right) + \frac{\lambda}{r} \cdot \frac{\partial T}{\partial r} \right\} \qquad (1)$$

[illegible] θ_m – [illegible] m-[illegible].

[illegible]:

$$T(\tau, r, \varphi)\big|_{r=\xi_-(\tau,\varphi)} = T(\tau, r, \varphi)\big|_{r=\xi_+(\tau,\varphi)} = T_{\text{[illegible]}} \qquad (2)$$

[illegible]

$$\lambda_1 \cdot \frac{\partial T}{\partial \bar{n}}\bigg|_{r=\xi_+} - \lambda_2 \cdot \frac{\partial T}{\partial \bar{n}}\bigg|_{r=\xi_-} = -\mu \rho_{\text{[illegible]}} \cdot \left(\theta_m \cdot \frac{\partial \xi}{\partial \varphi} + \frac{\partial \xi}{\partial \tau} \right) \qquad (3)$$

[illegible]:

[illegible]:

$$-\lambda \times \frac{\partial \mathrm{T}}{\partial \mathrm{r}}\bigg|_{\mathrm{r}=\mathrm{r}_{ɘ}} = \alpha_{ɘ} \times \left(\mathrm{T}_{ɘ} - \mathrm{T}\big|_{\mathrm{r}=\mathrm{r}_{ɘ}} \right) + \mathrm{C}_{ɘ} \times \left(\mathrm{T}_{ɘ}{}^4 - \left(\mathrm{T}\big|_{\mathrm{r}=\mathrm{r}_{ɘ}} \right)^4 \right) \qquad (4)$$

[illegible]:

$$\lambda \times \frac{\partial \mathrm{T}}{\partial \mathrm{r}}\bigg|_{\mathrm{r}=\mathrm{r}_{\text{[illegible]}}} = \alpha_{\text{[illegible]}} \times \left(\mathrm{T}_{\text{[illegible]}} - \mathrm{T}\big|_{\mathrm{r}=\mathrm{r}_{\text{[illegible]}}} \right) + \mathrm{C}_{\text{[illegible]}} \times \left(\mathrm{T}_{\text{[illegible]}}{}^4 - \left(\mathrm{T}\big|_{\mathrm{r}=\mathrm{r}_{\text{[illegible]}}} \right)^4 \right) \qquad (5)$$

[illegible]:

$$\mathrm{T}(0, \mathrm{r}, \varphi) = \mathrm{T}_0\,(\mathrm{r}, \varphi) \qquad (6)$$

[illegible]

[illegible]

[illegible] T(i,j,k), [illegible] (i,j,k) [illegible] (i+1,j,k), (i-1,j,k), (i,j+1,k), (i,j-1,k) [illegible] [2].

[illegible] Mathematica 5.0.

[illegible]

[illegible]

[illegible]

1. [illegible] 2010. - [illegible] 1(18) [illegible] 127–130

2. [illegible] 1985. – 384 [illegible]

[illegible] 5. [illegible]

[illegible]

[illegible]

[illegible]

[illegible] - Investestition [illegible] - Invecta et illata - [illegible]

[illegible]

[illegible] 90-[illegible] 10-[illegible] «[illegible]» [2, c. 24].

[illegible] 2006 [illegible] 109 [illegible] «[illegible]» («Greenfield investment») [illegible] 28 [illegible] («Mergers and Acquisitions»), [illegible] 2009 [illegible] 156 [illegible] 67 [illegible].

[illegible] 2011 [illegible] 151,7 [illegible] - 106,7 [illegible] 2011 [illegible] 1,85 [illegible] 292 [illegible] - [illegible] 58,5 [illegible] - [illegible] 1,5 [illegible] 2,83%, [illegible] - 89,6%, [illegible] (17,9%). [illegible]

[illegible]1

[illegible] %

[illegible]	2007	2008	2009	2010	2011
[illegible]	100	100	100	100	100
[illegible]:					
[illegible]	12,3	19,1	21,1	10,7	12,6
[illegible]	3	0,5	2,9	0,8	7,3
[illegible]	84,7	80,4	76	88,5	80,1

[illegible] [9].

[illegible] 2008 [illegible] 2000 [illegible] 2009 [illegible] 117%, [illegible] 1550%.

[illegible] 2010 [illegible] 70-72 [illegible] 75% [illegible] 16% - [illegible] 20 [illegible] 100-200 [illegible] 40 [illegible] 25-100 [illegible] 1-2 [illegible] [5].

[illegible]

⫬tsʟʷ‽fᵰsɘʘ ʉʧɋfᵰsʕ ʕtsʤʧʘʥɋ‽ ʝʞʝɢtsʜʥs ʧtsʧtsʤʥʷʝlsfᵰʸ, ˡlsts ʧtɐsɋfᵰ⫬tsʜɋls lstsɢʰʘ ʕtsɢʰʘ ɘʝʜlzʰ ɋʝ ɋʥsʝɢtɐɋʧtɐtsɘʘʥʑ ʝ ʙɋʟʥʝfᵰɢtɐʥʧʧʳ (ʀɪʇ), ɋʤʝʬ ʰ ɋʝ ɘ fᵰtsʝʤʒ fᵰsfᵰsʘɘʝ ʊˡʂ, fᵰsɋʤʒʥɋʧtɐʥʬ ls ɋʥsʝtɐʥʘʮɋtsʤʘʥɋʟʘʮɋʬ ɘlststɐtsfᵰsʝʧʝʥʑ ⫬ ʥʘʧtɐʘɘʤʝʥɋ‽ ʙɋʟʥʝfᵰʘ ʊʘʕ, ʥʘʧtɐɋʤʝtɕ ɘ 2007 ɢtsʜlz

ʀɪʇ «ɪʘʟtsɘʳ ‽ ˡʤʝʤʝʥs» fᵰsʘʥʘ tɐʘʟɘɋɘʘsˡ ʟʘʥlzʙʝʞʥlzʬ ˡʕfᵰʧʘʥfᵰɋʬ fᵰɸtsʝɢts fᵰstsɐtsɋlsʝʤʑʥsɢts ʙɋʟʥʝfᵰʘ ɘ ʷʥɐʘɐʝ ʧtɐɋʧtsʙtɐʝlsʷ ʟʘ35 ʤʒʤʥʑ ʜtsʤʥ ʕʘʟʘ⫬fᵰsʘʥfᵰʕlzʬ ʬɋtɐʤʒʥ «ʉɢfᵰstsʙʝ-ʉʝʤʝʥs», ʘɘ ʘɸɢlzfᵰsʝ ʟʘ1,7 ʤʒʥɐʜ. ʜtsʤʥ ï 30% ʘʕʯɋ‽ ʘɸfᵰstɐɋ‽fᵰʕts‽ ɋʥɐʞʝʤʝtɐʥs-fᵰstɐtsɋlsʝʤʑʥs‽ ʕtstɐʧtstɐʘʯɋɋ «ʉlstɐʘʙʘɢ» (ʟʥʘʯɋlsʝʤʑʥʑ ʝ ʘʕlsɋɘʳ tɐʘʟʤʝʰ ʝʥʑ lsʘʕʞʝ ɘʇʝtɐʤʒʘʥɋɋ).

ˡʘʯʘʥʘ ɋʥsʝtɐʥʘʮɋtsʤʘʥɋʟʘʮɋʬ ʥʘ ʥtsɘʳ ⫬ ʥʘʧtɐʘɘʤʝʥɋʷ ï ɘ ʤʒʘ ɋʥsfᵰstɐsʝʥɋɋ ɋ ˡʤʝtɐɢʝlsɋʕʝ ï ʀɪʇ «ʇʝʥsɘʘ», fᵰsʟʜʘʰ ʘʸ ɘ 2007 ɢtsʜlz ʟʘʝʤʜʤʸ tɐʘʟɘɋlsɋʷ ʧtɐtsʤʒ ʰ ʤʝʥʥs‽ ʊˡʂ. ˡʘʧtɐɋʙʥɋʟɋlsʝʤʑʥs 720ʤʒʤʥʑ ʜtsʤʥ ʉʝtɐʝʟ ʧtsʜfᵰsʘɸʥʑ ʝ ʬɋtɐʤʒ «ʇʝʥsɘʘ» ʧtɐɋʧtsʙtɐʝʥʘ31,4 % ʘʕʯɋ‽ ɋʟɘʝfᵰsʥsɢts ʰ ɘʝ‽ʯʘɐfᵰʕtsɢts ʧtɐtsɋʟɘtsʜɋlsʝʤʸ ʧtɐtsʤʒ ʰ ʤʝʥʥsɢts tsʙtstɐlzʜtsɘʘʥɋʷ «ˡlzʤʑ ʉʝtɐ», ʘʉʝtɐʝʟ fᵰɸtsʬ ʰ ɘʝ‽ʯʘɐfᵰʕlzʬ ʜtsʉʝtɐʥʑ ʬ fᵰstɐʥʕlsʑtɐʥ «ɸɘʝʥʘɕ ʕʤʝtɐʜʞɋ» ʟʘʧtsʉlsɋ 700 ʤʒʤʥʑ ʜtsʤʥ ʕlzʧɋʥʘ 80% ʘʕʯɋ‽ ʕtɐʥʧʥsɢts ɋɢtɐtsʕʘ ɋlsʘʥʷʥʑfᵰʕtsɢts tɕ ʥʕʘ ʘʥʑ lsʝtɐʥʘlsɋɘʥs‽ ˡʤʝtɐɢʝlsɋʕɋ «ʕʤʝtɐʜʞʝlsɋʕ fᵰstɐfᵰ». ʇtsʜtsʤʒ tɐʘʥʝʝ ɘ ʐ ɘʝ‽ʯʘɐɋɋ «ʇʝʥsɘʘ» ʧtɐɋʧtsʙtɐʝʥʘ ʟʘ 420 ʤʒʤʥʑ ʜtsʤʥ 10,25% ʘʕʯɋ‽ ɋʥʥsɘʘʯɋtsʤʥʥs‽ ʬɋtɐʤʒ «ʕtɐʥʕtsʥ». ˀtɐɋ ˡlstsʤʒ ɋʤʝʝlsfᵰʸ ɘtsʟʤʒsʞʥsfᵰsˡ tɐʘʟɘɋlsɋʷ ʧtɐtsɋʟɘtsʜfᵰsɘʝʥʑ ⫬ fᵰɸʷʟʝ‽ ʤʒʞʜlzɘfᵰʝʤʒɋ lstɐʝʤʒʷ ʕtsʤʒʧʘʥɋʷʤʒɋ ʧts ɘʳ ʧlzfᵰʕlz fᵰsʤʥʝʯʥʑ ⫬ ʙʘlsʘɐʝ‽.

ʊʘʕʞʝ ʤʒsʞʥs tslsʤʝlsɋˡ, ʉlsts ʥʘʯɋʥʘʘ ls ɋʥsʝtɐʥʘʯɋtsʤʘʥɋʟʘʮɋʬ ʕtsʤʒʧʘʥɋɋ, ʤʝ ɘ⫬tsʜʷʰ ɋʝ ɘ fᵰsfᵰsʘɸ ʕtɐʥʧʥʑ ⫬ ʀɪʇ. ʊʘʕ, ɘ 2007 ɢtsʜlz ʧʝtɐɘʳ ʝ ɋʥɐʝfᵰsɋʯɋɋ ʟʘ tɐʥʙʝʞtsʤʒ tsfᵰlzʰ ʝfᵰsɘɋʥɋ ʤʝfᵰʕtsʥʕts lsʘʕɋ⫬ ʬɋtɐʤʒ tsʙʲ ʝʤʒtsʤʒ fᵰɸʳ ʰ ʝ 100 ʤʒʤʥʑ ʜtsʤʥ ʂ tsʤʒʧʘʥɋʷ «ʇlzfᵰfᵰʤʝʷlsˡ» ʕlzʧɋʥʘ 50% ʘʕʯɋ‽ ʬɋtɐʤʒ , ʕtsʥʑstɐtsʤʧtɐʥʬ ʰ ʝ‽ ʤʝfᵰstststɐtsʞʜʝʥɋʝ ɪɋʥʘɢʘʜʳ ɘ ɸʟʝtɐʙʘ‽ʜʞʘʥʝ (ʟʘ 200 ʤʒʤʥʑ ʜtsʤʥ). ʀʟɘʝfᵰsʤʑ ‽ ʧtɐtsɋʟɘtsʜɋlsʝʤʑ fᵰʝʤʑ fᵰʕts⫬tsʟʷ‽fᵰsɘʝʥʑs‽ lsʝ⫬ʥɋʕɋ «ʇ tsfᵰsfᵰʝʤʑ ʤʒʘ » ʟʘ130 ʤʒʤʥʑ ʜtsʤʥ ʕlzʧɋʥlz ʧtɐtsɋʟɘtsʜɋlsʝʤʸ ʤʒsʰ ʥʑ ⫬ lstɐʘʕlststɐtsɘ «ɪlzʤʝtɕ ɋʥʜʘfᵰstɐɋʟ» fᵰʟʘɸtsʜʘʤʒɋ ɘ ʂ ʘʥʘʜʝ ɋ ʉʐ ɸ [6, fᵰ67].

ʊʘʕɋʤʒ tsʙtɐʘʟtsʤʒ ʧtɐtsʉʝfᵰfᵰɋʥsʝtɐʥʘʯɋtsʤʘʥɋʟʘʮɋɋ tɐtsfᵰfᵰʕ‽fᵰʕɋ⫬ ʊˡʂ ʙlzʜʝls ʧtɐtsʜtsʤʞʘsˡ fᵰʸ, ʧtsʕʘɘ ʯɋfᵰʥs ʊˡʂ ʤʝ ɘts‽ʜlzls ɘfᵰʝ ɘʝʜlzʰ ɋʝ ʕtsʤʒʧʘʥɋɋ ʧtɐtsʤʒ ʰ ʤʝʥʥsfᵰsɋɋfᵰʸ ʝtɕ lzfᵰʥlzɢ.

ʆ fᵰʥsɘʥʑ ʤʒɋ fᵰstɐʘʥʘʥʒɋ tɐtsfᵰfᵰʕ‽fᵰʕts‽ ɋʥɘʝfᵰsɋʯɋtsʥʥs‽ ˡʕfᵰʧʘʥfᵰɋɋ fᵰʝʜɋ fᵰstɐʘʥʑ ʉˡʇ ʷɘʥʬ lsfᵰʸ ʋʕtɐʘɋʥʘ ɋ ʂʘʟʘ⫬fᵰsʘʥʑ ʆlsʥsfᵰɋlsʝʤʑʥs ʤʝɘʳ fᵰsʕʘʸ ʜtsʤʸ ɘʥtsʞʝʥɋ‽ fᵰs fᵰstststɐtsʤʑ tɐtsfᵰfᵰʕ‽fᵰʕɋ⫬ ʕtsʤʒʧʘʥɋ‽ ɘ fᵰstɐʘʥʑ ʉˡʇ ʤʒsʞʝls ʙʳ lsˡ tsʙʲ ʷfᵰʤʝʥʘ ʤʝfᵰʕtsʤʑ ʕɋʤʒɋ ʧtɐɋʯɋʥʘʤʒɋ. ɪts-ʧʝtɐɘʳ ⫬, ˡʕtsʥtsʤʒɋʕɋ ˡlsɋ⫬ fᵰstɐʘʥ ʤʒʘʥ , ʧtsˡlstsʤʒlz tsʥʥɋ ʤʒʘtsʧtɐɋɘʝʕʘlsʝʤʑ fᵰlststɐʯɋ ʟtɐʝʥʷ tɕ ʥʕtsɘ fᵰɸʳ lsʘ ʂ tɐtsʤʝʬ lstsɢts, ʤʝtsʙ⫬tsʜɋʤʒs lzʯɋlsʳ ɘʘsˡ , ʉlsts tsfᵰʥsɘʥʑ ʤʒɋ ɋʥɘʝfᵰstɐtsʤʒɋ ʷɘʥʬ lsfᵰʸ ʕtsʤʒʧʘʥɋɋ fᵰ tɕ ʝɘtsɢts fᵰʝʕlstsʘ ʘˡʕtsʥtsʤʒɋʕɋ ˡlsɋ⫬ fᵰstɐʘʥʟʥʘʯɋlsʝʤʑ ʥʘʤʝʰ ʝ ʥʘʞʜʘ lsfᵰʸ ɘ ˡʤʝtɐɢtɐtsʤʝfᵰlzʥʝfᵰʘ. ɪ ʥʘfᵰsʝʷʰ ʝʝ ɘʝtɐʝʤʒʷ ɘts ʤʒʥsɢɋ⫬ fᵰstɐʘʥʘ⫬ ʉˡʇ fᵰʸtsʤʝʕɋtɐtsɘʘʥɋfᵰ ʕtɐʥʧʥʑ ʝ ʬɋʥʘʥfᵰɘts-ʧtɐtsʤʒ ʰ ʤʝʥʥʑ ʝ ɢtɐʥʧʧʳ (ʌˀʇ), ʕtsʥstɐtsʤʧtɐʥʬ ʰ ɋʝ tsfᵰʥsɘʥʑ ʝ ʘʕlsɋɘʳ. ʕlsɋ ʥʘʯɋtsʤʘʥʑʥʑ ʝ ʌˀʇ ʧtɐʝʧʷlsfᵰsɘlzʬ ls ʧtɐtsʤʒɋʕɋɘʝʥɋʬ ɋʥsfᵰstɐʘʥʑ ⫬ ɋʥɐʝʝfᵰstɐtsɘ [3, fᵰ18].

ʆ fᵰʥsɘʥʑ ʤʒɋ fᵰstɐʘʥʘʥʒɋ- tɐʝʯɋʧɋʝɋʥsʘʥɋ tɐtsfᵰfᵰʕ‽fᵰʕɋ⫬ ɋʥɐʝfᵰsɋʯɋ‽ ʷɘʥʬ lsfᵰʸ fᵰstɐʘʥʑ ʜʘʥʑʤʝɢts ʟʘʥlzʙʝʞˡʷ ɋ fᵰstɐʘʥʑ , tslsʥsfᵰʸʰ ɋʝ fᵰʸ ʕ tsʷʷʰ tstɐʥʑ ʤʒ lsʝtɐʥɋfᵰlststɐɋʷʤʒ lsʘʕɋʝ ʕʘʕ ʂ ɋʧtɕ ɪ ɋtɕɢɋʥfᵰʕɋʝ tsfᵰstststɐtsɘʘ

ɪʝʜlzʰ ɋʤʒʧtsʤʥʯɋʝʤʝʤʒʕʘʧɋlsʘʥtsɘʥsʞʝʥɋ‽ tslsʝʉʝfᵰsɘʝʥʑ ⫬ ʊˡʂ (30-40 %) ʷɘʥʸʝlsfᵰʸ ɾʉ, ⫬tslsʷ ʝɢts ʜtsʥʸ ʧtsfᵰsʝʧʝʥʑs fᵰsʕtɐʘ ʘlsfᵰʸ ʟʘfᵰʝls ɘʳ ⫬tsʜʘtɕʷʜʘʕtsʤʒʧʘʥɋ‽ ʥʘtslsʜʘʥʝʥʑ ʝ tɕ ʥʕɋ (ʥʘʧtɐɋʤʝtɕ, ʧtsʕlzʧʕʘ «ˡ tstɐɋʥʑ fᵰʕɋʤʒ ʥʕʝʤʝʤʒ» ʟʘ ʤʝfᵰʕtsʥʕts ʤʒɋʥʥɋʘɐʜtsɘ ʜtsʥʘtɐtsɘ ʬɋtɐʤʒ «ʆʘ‽tsʥʆtɕ ʤʒʘʥɋʥɢ» tɐtsfᵰfᵰʕ‽fᵰʕɋʝ ˀʀʀ ʟʘʤʝʥsʥʥs ɘʳ tɐtsfᵰʥʕɋ ɘ ʂ ʘʥʘʜʝ, ɸɘfᵰstɐʘʥʑ ɋɋ ɋ ʒ ɸɾ). ɸʙfᵰsʥʑ lsʥʑ ʤʒɋ tɐʘʟʤʝʤʝʤʒɋ ʘʕʕlzʤʒlzʥɋtɐtsɘʘʥʑ ⫬ tɐtsfᵰfᵰʕ‽fᵰʕɋ⫬ ˀʀʀ ɘɾʉ ɘʳ ʜʝʥʷ lsfᵰʸ ʇʝtɐʤʒʘʥɋʷ ɋ ʀ lsʘʥʑʷ [7,fᵰ14].

ʆ ʥʑɢɋʝ tɐtsfᵰfᵰʕ‽fᵰʕɋʝ ʕtsʤʒʧʘʥɋɋ fᵰsʟʜʘʸ ls ɘ fᵰstɐʘʥʘʥʒ⫬-tsʷʷʰ tstɐʘ⫬ fᵰɸtsɋ ʧtsʜtɐʘʟʜʝʤʝʥɋʷ ʜʥʸ ʧtɐɋɘʝʤʝʉʝʥɋʷ ʬɋʥʘʥfᵰɘtsɘʳ ⫬ tɐʝfᵰʸtɐʘfᵰtsɘ. ɪ ˡlstsʤʒ fᵰʥlzʯɋ ʤʒʘʝɋɋɋʥfᵰʘʘɋʥɘ ʕtsʤʒʧʘʥɋʷ ʧtɐʝʜtsfᵰsʘɸʥʷʝls ʬɋʥʘʥfᵰɘtsɘʳ ʝ ɢʘʥʘʥʑɋɋ ʧts lsʘʕɋʤʒ ʟʘʤʒʘʥʒ ʉlsts fᵰʥɋʞɋls ʬɋʥʘʥfᵰɘtsɘʳ ʝ tɐɋfᵰʕɋ, ʘ ɋʥsfᵰstɐtsʥʘʥʘʸ ʬ tɐɋfᵰʜɋʕʯɋʷ fᵰʥʝʤʒʟɋls ʟʘʕtsʥtsʜʘʥʑ ʝ tɐɋfᵰʕɋ. ˡʘʧtɐɋʤʝtɕ, ʬtstɐʤʒʘʥʑ ʤʒ ˡʤʒʟɋlsʝʥʑstsʤʒ ʉʝls tɐʝ⫬ ɘʳ ʧlzfᵰʕtsɘ ʝɘtstststsʙʥɋɢʘʯɋ‽ «ʆʋʂʆʬʆʘ» ʥʘ 2,5 ʤʒʥɐʜ. ʜtsʤʥ ʷɘʥʸʝlsfᵰʸ ʕtsʤʒʧʘʥɋʷ Lukoil International Finance B.V., tɐʘfᵰʧtsʥʘʘ ʰ ʘfᵰʸ ɘ ˡɋʜʝtɐʥʘʜʥʘ⫬, ⫬tslsʷ ʬʘʕlsɋʉʝfᵰʕɋ ˡlsɋ ʜʝʥɢɋ ɋfᵰʧtsʥlzʟlzʬ lsfᵰʸ «ʆʋʂʆʬʆtsʤʒ». ʕʤʒɋfᵰfᵰɋʷ ʉʝʥʑ ⫬ ʙlzʤʒʘɢ ʧts ɢtsʤʥʘʥʜʬfᵰɋʤʒ ʟʘʕtsʥʘʤʒ ʧtsʟɘtsʤʝɋʥʘ fᵰsʟʜʘls tslsʥsfᵰɋlsʝʤʑ ʥʑʕɘɋʜʥʑ ‽ ɘlststɐɋʉʥ ‽ tɕ ʥsʕ ˡlsɋ⫬ ʙlzʤʒɢ, ʉlsts lzɘʝʥɋʯɋʥs ɋ⫬ ʧtɐɋɘʝʕʘlsʝʥʑsfᵰsˡ.

– [illegible] 10 [illegible]

[illegible] 146 [illegible] 2010 [illegible] - Transparency International, [illegible] (10 [illegible]) [illegible] 2,8 [illegible] (95-[illegible]), [illegible] «[illegible]». [illegible] [3, [illegible]14].

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[illegible]

[illegible]

ɼ tsfiɟsʘlstsɥdʑs ɥʘfiɟsts ɥjdʑɖ ɖdʑɟfiɟsɖɥɖtsdʑdʑ ⁼ tʃtetsj ʕlstsɘ ʜtsfiɟsɖɢʘ lsfiʸ, ʘfiɟsteʘlsjɢɖɥjfiʃɖj ɥjdʑɖ ʕtsdʒʃʘdʑɖɖ ï dʑls. ɟ teɖɥɖdʑs? ʷɘdʑʸjlsfiʸ dʑfiɟsɢdʑʘfiɟsɘʘdʑdʑsfiɟsᴵ ɥjdʑ? tslsʜjdʑdʑ ⁼ tʃtetsjʕlstsɘ ɖ dʑjtetstʃteɖʷlsɖ? ɖ fiɟsteʘlsjɢɖɥjfiʃɖ⁼ ɥjdʑ? ʕtsdʒʃʘdʑɖɖ, ʘ lsʘʕɣj dʑfiɟsɢdʑʘfiɟsɘʘdʑdʑsfiɟsᴵ ɖ ʜʘɣj tʃtetslsɖɘtsteɟɥɖj ɥjdʑ? dʑʘtsʜdʑsdʒ ɮtetsɘdʑ. ɼ dʑʸ tʃtsɘʳ ʰ jdʑɖʷ ˡʷʷj ʕlsɖɘdʑsfiɟsɖ ʜjʷlsjdʑdʑsfiɟsɖ ɢtstedʑs? ʕtsdʒʃʘdʑɖɖ dʑtsʙ⁼tsʜɖdʒs, ɥlstsʙʳ ɖdʑɟfiɟsɖɥɖtsdʑdʑ ? tʃtetsjʕls tslsɘjɥʘdʑ jj tstʃjteʘlsɖɘdʑdʒ ɖ fiɟsteʘlsjɢɖɥjfiʃɖdʒ ɥjdʑʸdʒ ʂ tetsdʑ lstsɢts, ʕtsdʒʃʘdʑɖʷ ʜtsdʑɣdʑʘtsʙdʑʘʜʘlsᴵ dʑtsʙ⁼tsʜɖdʒʳ dʒɖ teɟfiɟɮtefiɟʘdʒɖ ɖ ɘtsʟdʒsɣdʑsfiɟsʷdʒɖ (lsj⁼dʑsdʑsɢɖɖ, dʒʘlsjteɖʘdʑ , ʷɖdʑʘdʑfiɟ ɖ tʃte) ʜdʑʸ teɟʘdʑɖʟʘɥɖɖ ɥjdʑ? tʃtetsjʕlsʘ

ʊʘʕɖdʒ tsʙteʘʟtsdʒ fiɟsteʘlsjɢɖɥjfiʃɖ? (dʒʘfiɟ lsʘʙdʑ ?) ɖdʑɟfiɟsɖɥɖtsdʑdʑ ? tʃtetsjʕls ɢtstedʑs? ʕtsdʒʃʘdʑɖɖ ʜtsdʑɣjdʑ

-tslsɘjɥʘlsᴵ lsteɟʙtsɘʘdʑɖʷdʒ ɥjdʑ tʃtsdʑʘɢʘdʑɖʷ;

-tslsɘjɥʘlsᴵ lsteɟʙtsɘʘdʑɖʷdʒ ɥjdʑ tsfiɟɮʰ jfiɟsɘdʑ dʑɖʷ;

-tsʙjfiɟʃjɥɖlsᴵ tʃtsɘʳ ʰ jdʑɖj ˡʷʷj ʕlsɖɘdʑsfiɟsɖ tslsʜjdʑdʑ ⁼ ʙɖʟdʑ fiɟtʃtetsɥjfiɟfiɟsɘ, ʜjʷlsjdʑdʑsfiɟsɖ tʃtsʜteʘʟʜjdʑdʑɖ?, ʕtsdʒʃʘdʑɖɖ;

-tsʙjfiɟʃjɥɖlsᴵ tetsfiɟsɥjdʑdʑsfiɟsɖ ʕtsdʒʃʘdʑɖɖ.

ʊteʘʜɖɥɖtsdʑdʑ j tʃtsʕʘʟʘlsjdʑɖ ˡʷʷj ʕlsɖɘdʑsfiɟsɖ ɖdʑɟfiɟsɖɥɖtsdʑdʑ ⁼ tʃtetsjʕlstsɘ (ʏɼɼ, ʀɼ, ɪɿɼ, fiɟtetsʕ tsʕɮtʃʘ dʒsfiɟsɖ) tʃtsʟɘtsdʑʸ ls dʑɖʰ ᴶ ɥʘfiɟsɖɥdʑs tsɥjdʑɖlsᴵ fiɟsʙdʑ ʜjdʑɖj ʜɘɮ⁼ tʃtsfiɟdʑʜdʑɖ⁼ ʕteɖlsjteɖjɘ. ɟ teɖ ˡlstsdʒ tʃtetsjʕls dʒsɣjls dʑ ɮʜtsɘdʑlsɘtsteʷlsᴵ lsteɟʙtsɘʘdʑɖʷdʒ ɥjdʑ tʃtsdʑʘɢʘdʑɖʷ ɖ ɥjdʑ tsfiɟɮʰ jfiɟsɘdʑ dʑɖʷ.

ɼ dʑʸ teɟʰ jdʑɖʷ ˡlsts? tʃtetsʙdʑdʒʳ dʑtsʙ⁼tsʜɖdʒ ɖdʑfiɟsteɮdʒjdʑls, tʃtsʟɘtsdʑʸ ʰ ɖ? tʃtetsɘjteɖlsᴵ fiɟstslsɘjlsfiɟsɘɖj ɥjdʑ? dʒʘfiɟ lsʘʙdʑ ⁼ ɖdʑɟfiɟsɖɥɖtsdʑdʑ ⁼ tʃtetsjʕlstsɘ ɥjdʑʸdʒ ʕtsdʒʃʘdʑɖɖ, ʘ lsʘʕɣj tsɥjdʑɖlsᴵ ɘdʑɖʷdʑɖj teɟʘdʑɖʟʘɥɖɖ tʃtetsjʕlsʘdʑʘtʃtsʕʘʟʘlsjdʑɖ ʜjʷlsjdʑdʑsfiɟsɖ ɖ fiɟstsɖdʒsfiɟsɖ ʕtsdʒʃʘdʑɖɖ.

ʈjʘdʑɖʟʘɥɖʷ dʒʘfiɟ lsʘʙdʑsɢts ɖdʑɟfiɟsɖɥɖtsdʑdʑsɢts tʃtetsjʕlsʘɢtstedʑs? ʕtsdʒʃʘdʑɖɖ fiɟstʃtetsɘtsɣʜʘlsfiʸ tʃteɖdʑʸlsɖjdʒdʒdʑsɣjfiɟsɘʘtsteɢʘdʑɖʟʘɥɖtsdʑdʑs-ˡʕtsdʑsdʒɖɥjfiʃɖ⁼ teɟʰ jdʑɖ?:

-ɘʳ ʙtsteɖfiɟstsɥdʑʕtsɘ ɖ fiɟsteɮʕlsɮteʷ ʷɖdʑʘdʑfiɟtetsɘʘdʑɖʷ tʃtetsjʕlsʘ;

-tstʃteɟʜjdʑdʑɖj tsʙʲ jdʒsɘ tʃtetsɖʟɘtsʜfiɟsɘʘlstsɘʘtedʑs? tʃtetsʜɮʕɥɖɖ;

-ɘʳ ʙtsteɖdʑtsʙ⁼tsʜɖdʒʳ ⁼ dʒʘlsjteɖʘdʑdʑ ⁼ teɟfiɟɮtefiɟsɘ;

- ɘʳ ʙtstetʃtsfiɟsʘɘʰ ɖʕtsɘ dʒʘlsjteɖʘdʑsɘ ɖ tsʙtsteɮʜtsɘʘdʑɖʷ;

-ɮfiɟsʘdʑsɘdʑdʑɖj ɥjdʑ teɟʘdʑɖʟɮjdʒs? tʃtetsʜɮʕɥɖɖ ɖ fiʃɖʜʕɖ fiɟɥjdʑ ;

- ɘʳ ʙtstelsj⁼dʑsdʑsɢɖɖ ɖ lsʜ.

ɟ teɖ ˡʕtsdʑsdʒɖɥjfiʃtsdʒ tsʙtsfiɟdʑsɘʘdʑɖɖ ɮtʃteʘɘdʑdʑɥjfiʃɖ⁼ teɟʰ jdʑɖ? teʘfiɟfiɟɥɖlsᴵ ɘʘdʒʳ j lsteʘʜɖɥɖtsdʑdʑ j tʃtsʕʘʟʘlsjdʑɖ tʃteɖʙʳ dʑɖ ɖ teɟdʑlsʘʙjdʑdʑsfiɟsɖ dʑ ɮɥɖlsᴵ ɘʘ ls ɘdʑɖʷdʑɖj teɟʘdʑɖʟɮjdʒʳ ⁼ ɮtʃteʘɘdʑdʑɥjfiʃɖ⁼ teɟʰ jdʑɖ? ɖ tʃtetsjʕlstsɘ dʑʘ ʷɖdʑʘdʑfiɟsɘʳ j ɖ dʑ ʷɖdʑʘdʑfiɟsɘʳ j tʃtsʕʘʟʘlsjdʑɖ ɢtstedʑs? ʕtsdʒʃʘdʑɖɖ. ʂ tetsdʑ lstsɢts dʑ teʘfiɟfiɟʘlsteɖɘʘ lsfiʸ ɖdʑlsjteɟfiɟ ʟʘɖdʑlsjteɟfiɟsɘʘdʑdʑ ⁼ fiɟstetsdʑɘ lsts ɘteɟdʒʷ ʕʘʕ ɘ ɢtstedʑs? ʕtsdʒʃʘdʑɖɖ ɘ fiɟʷʟɖ fiɟ lsʷɣjdʑ dʒɖ ɮfiɟdʑsɘɖʷdʒɖ lsteɮʜʘ tʃjtefiɟsdʑʘdʑʘ ʘ lsʘʕɣj ɢteʘʜtstsʙteʘʟɮᴮ ʰ ɖdʒ ʙᴮ ʜɣjlstsʙteʘʟɮᴮ ʰ ɖdʒ ɖ fiɟsɥɖʘdʑdʑs ʟdʑʘɥɖdʒ dʒ fiɟsʘlsɮfiɟsdʒ ʕtsdʒʃʘdʑɖɖ dʑtsʙ⁼tsʜɖdʒsfiɟsᴵ ɮɥjlsʘɖdʑlsjteɟfiɟsɘ fiɟsj?ʕ⁼tsdʑʜjtetsɘ ɘtsʟteʘfiɟsʘjls.

ɪ ʕʘɥjfiɟsɘj ɖdʑfiɟsteɮdʒjdʑlsʘ teʘʟteʘʙtslsʕɖ ɖ tsɥjdʑʕɖ ɖdʑɟfiɟsɖɥɖtsdʑdʑ ⁼ tʃtetsjʕlstsɘ ʘɘlststetsdʒ tʃteɟʜdʑʘɢʘ lsfiʸ ʕtsdʒʃdʑʕfiɟdʑsj tʃteɖdʒjdʑdʑɖj ʕtsdʑɥjtʃɥɖ? ɮtʃteʘɘdʑdʑɖʷ tʃts ɥjdʑʸdʒ ɖ fiɟʙʘdʑʘdʑfiɟtetsɘʘdʑdʑs? fiɟfiɟsj dʒʳ tʃtsʕʘʟʘlsjdʑ?.

ʄ jlstsʜtsdʑsɢɖʷ ɮtʃteʘɘdʑdʑɖʷ tʃts ɥjdʑʸdʒ tʃtsʟɘtsdʑʸjls tsɥjdʑɖlsᴵ fiɟstslsɘjlsfiɟsɘɖj teɟʘdʑɖʟɮjdʒʳ ⁼ ɖdʑɟfiɟsɖɥɖtsdʑdʑ ⁼ tʃtetsjʕlstsɘ ɖ tʃteɖdʑɖdʒʘdʒʳ ⁼ ɮtʃteʘɘdʑdʑɥjfiʃɖ⁼ teɟʰ jdʑɖ? fiɟsteʘlsjɢɖɥjfiʃɖdʒ ɥjdʑʸdʒ ʕtsdʒʃʘdʑɖɖ ɖ lsteɟʙtsɘʘdʑɖʷdʒ ɥjdʑ tsfiɟɮʰ jfiɟsɘdʑ dʑɖʷ. ʉʙʘdʑʘdʑfiɟtetsɘʘdʑdʑʘʸ fiɟfiɟsj dʒʘ tʃtsʕʘʟʘlsjdʑ? ɮɥɖlsᴵ ɘʘls tʃteɖɥɖdʑdʑs-fiɟdʑʜfiɟsɘjdʑdʑ j fiɟʷʟɖ dʒɣʜɮ ʙɖʟdʑfiɟtʃtetsɥjfiɟfiɟdʒɖ, ʘ lsʘʕɣj ɘdʑɖʷdʑɖj ɖ ɖdʑlsjteɟfiɟ fiɟsj?ʕ⁼tsdʑʜjtetsɘ.

ɸdʑɢtsteɖlsdʒ tʃtsfiɟsʘdʑsɘʕɖ ɖ teɟʘdʑɖʟʘɥɖɖ ɥjdʑ? ɢtstedʑs? ʕtsdʒʃʘdʑɖɖ ʜtsdʑɣjdʑ ɘʕdʑ ɥʘlsᴵ 5 ˡlsʘʃtsɘ:

1. ***ʘdʑʘdʑɖʟ ɥjdʑ? fiɟsj?ʕ⁼tsdʑʜjtetsɘ;***
2. ***ʘdʑʘdʑɖʟ ɘdʑʰ dʑ? ɖ ɘdʑlsteɟdʑdʑ? fiɟteɟʜʳ ;***
3. ***ɥjdʑ tʃtsdʑʘɢʘdʑɖj ;***
4. ɥjdʑ tsfiɟɮʰ jfiɟsɘdʑ dʑɖj;
5. tsɥjdʑʕʘɥjdʑ tsfiɟɮʰ jfiɟsɘdʑ dʑɖʷ.

[illegible] SMART, [illegible]:

- [illegible] (Specific);
- [illegible] (Measurable);
- [illegible] (Achievable);
- [illegible] (Result ï oriented);
- [illegible] (Timed).

[illegible] «[illegible]» - [illegible] «[illegible]» [illegible] «[illegible]». [illegible]

[illegible] 2015 [illegible] Fe 63% [illegible] 2,5[illegible]. [1]

[illegible] SMART ([illegible]1).

[illegible]1

[illegible] «[illegible]» [illegible] SMART

[illegible] SMART	[illegible]	[illegible]
[illegible]	[illegible] 63%	[illegible]
[illegible]	[illegible] (63%) [illegible] (2,5 [illegible].)	[illegible]
[illegible]	[illegible] (4 [illegible].), [illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible] - 2015 [illegible] - 50 [illegible]	[illegible]

[illegible] 2 [illegible].

[illegible]2

[illegible] «[illegible]»

[illegible]	[illegible]
[illegible]	-[illegible] (100%); -[illegible] (100%) -[illegible] (50%:50%)
[illegible]	-[illegible] -[illegible] -[illegible]
[illegible]	- CETCO ([illegible] RocheMining [illegible]) - [illegible] "[illegible]"
[illegible]	-[illegible]

	[illegible]
[illegible]	[illegible] [illegible]

[illegible] [illegible]

[illegible] 3 [illegible] [2].

[illegible]

[illegible]

[illegible]	[illegible]		
	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	EVA	
		[illegible]	
		[illegible]	
[illegible]	[illegible]	[illegible]	
	[illegible]		
	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]		
[illegible]	[illegible]		[illegible]
	[illegible]		
	[illegible]		
[illegible]		[illegible]	
		[illegible]	
		[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]		

[illegible]

[illegible] 1.

[illegible].

[illegible].

[illegible]

1. [illegible] 2010. -395 [illegible]

[illegible] //«[illegible]». [illegible], 2012, [illegible] 196 [illegible] 195-201.

[illegible]

[illegible]

[illegible]

[illegible].

[illegible] 1 - [illegible]

[illegible]	2007	2008	2009	2010	2011
[illegible]					
[illegible]	11 734	11 723	11 063	11081	11285
[illegible] -[illegible]; -[illegible] %	20 131 -	25 214 125,25	24 896 98,74	28 140 113,03	31330 111,34
[illegible] - [illegible] - [illegible] °/[illegible]	219,43 -	225,42 102,73	230,01 102,04	231,94 100,84	232,28 100,15
[illegible]					
[illegible]	10 453	9 985	9 722	9 916	10 085
[illegible] -[illegible]; -[illegible]%	19 258 -	23 078 119,84	19 398 84,05	22321 115,07	26165 117,22
[illegible] -[illegible] -[illegible] °/[illegible]	201,53 -	213,10 105,13	229,59 107,74	256,55 111,82	282,82 1 10,24
[illegible]					
[illegible]	9 233	7 918	7 429	7 532	7 700

[illegible] -[illegible] -[illegible] %	17 293 -	22 230 128,55	19598 88,16	23 737 121,12	28 083 118,31
[illegible]					
[illegible]	48493	46723	44774	52609	54451
[illegible] -[illegible] -[illegible] %	16985 -	21375 125,85	19618 91,78	24218 123,45	28440 117,43
[illegible] [illegible] - [illegible] %	228,75 -	227,01 99,24	229,77 101,22	230,23 100,20	232,41 100,95

[illegible] ([illegible] 1).

[illegible]

[illegible]

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

[illegible]

[illegible]

[illegible]

					[illegible]

[illegible]

[illegible]

[illegible] 2

[illegible]

[illegible]

[illegible]

[illegible] (1).

[illegible]

[illegible] 1 [illegible]

[illegible]	[illegible]
1	2
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

fŋʤʎʃϰ ʝ ʤʎʃʝ lʐtɕtsɘʤʐ ʗʃfŋʧtsʤ ʟtsɘϴʤʎʃʷ ʧtɕtsʗʃʟɘtsʜfŋʝsɘʝʤʎʤ ⁼ ʤʒʃʰ ʤʎsfŋʝsʝ ʔ ʤʒ lsϴʤʤʤtɕɢʗʃʯʝ fŋʗʃ⁼ ʧtɕʝʜʧtɕʃʷlsʗʃʔ ɘ fŋʷʟʗʃ fŋ fŋʝsʕtɕϴʲ ʝʤʎʃʝʤʒ tsʙʲ ʝʤʒtsɘ ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴtsfŋʤʎtsɘʤʐ ⁼ ɘʗʃʜtsɘ ʧtɕtsʜlʐʕʯʗʃʗʃ	fŋʧʝʯʗʃʷʗʃʕϴ fŋʧtɕtsfŋϴ ʤʎϴ ʧtɕtsʜlʐʕʯʗʃᴮ ʤʒ lsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ, tsɢtɕϴʤʎʗʃʯʝʤʎʤ ʔ ⁼ϴtɕϴʕ lsʝtɕʝʝ fŋʙʳ lsϴ
fŋʝsʕtɕϴʲ ʝʤʎʃʝ ʟϴlstɕϴls ʤʎϴ lststʃʤʎʗʃɘʤʎs-ˡ ʤʝtɕɢʝlsʗʃʯʝ fŋʗʃʝ tɕʝfŋʐtɕfŋ ʧtɕʃ ʧtɕtsʗʃʟɘtsʜfŋʝsɘʝ ʧtɕtsʕϴlsϴ ʯʝtɕʤʐ ⁼ ʤʒlsϴʤʤtsɘ ʗʃ tɕtsfŋʝs ʧtsʜtsʙʤʐ ⁼ ʟϴlstɕϴls ʧtɕʗʃ ʧtɕtsʗʃʟɘtsʜfŋʝsɘʝ ˡ ʤʝʕlstɕtsfŋʝsϴʤʎʗʃ ʗʃ ʯʐɢʐʤʎϴ	tɕϴʟʤʎϴʸ ʜtsʤʐ ɘʤʎʗʃʷʤʎʗʃʷ lststʃʤʎʗʃɘʤʎs-ˡ ʤʝtɕɢʝlsʗʃʯʝ fŋʗʃ⁼ tɕʝfŋʐtɕfŋʝsɘ ʤʎϴ fŋʝʙʝ fŋʝstsʗʃʤʒtsfŋʝsᴵ tsfŋʤʎtsɘʤʐ ⁼ ɘʗʃʜtsɘ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsʔ ʧtɕtsʜlʐʕʯʗʃʗʃ
ʟϴʤʒʝʜʤʝʤʎʃʝ lsʝʤʒʧtsɘ tɕtsfŋʝsϴ tsʧʤϴlsʳ lstɕʤʜϴ tɕϴʙtslsʤʎʗʃʕʤʒ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ	ʜʗʃʷʷʝtɕʝʤʎʯʗʃϴʯʗʃʷ tsʧʤϴlsʳ lstɕʤʜϴ tɕϴʙtslsʤʎʗʃʕtsɘ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ lsʝ⁼ʤʎsʤʎsɢʗʃʯʝ fŋʗʃ fŋʝstʃtɕʷϰ ʝʤʎʤ ⁼ ɘʗʃʜtsɘ ˡ ʕtsʤʎsʤʒʗʃʯʝ fŋʗtsʔ ʜʝʷlsʝʤʐ ʤʎsfŋʝsʗʃ: ʜtsʙʳ ʯʗʃ ʧtsʤʝʟʤʐ ⁼ ʗʃfŋʗtsʧϴʤʒ ⁼ (ʕtɕtsʤʒ lststʃʤʎʗʃɘʤʎs-ˡ ʤʝtɕɢʝlsʗʃʯʝ fŋʗʃ⁼) ʗʃ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ
lʐ⁼lʐʜʰ ʝʤʎʃʝ lʐfŋʤʎtsɘʗʃʔ lstɕʤʜϴ tɕϴʙtslsʤʎʗʃʕtsɘ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ	ʤʎϴʤʎʗʃʯʗʃʝ tsfŋʝsʙʳ ⁼ ɢʗʃɢʗʃʝʤʎʗʃʯʝ fŋʗʃ⁼ ʤʎstɕʤʒϴlsʗʃɘtsɘ lʐfŋʤʎtsɘʗʃʔ lstɕʤʜϴ tɕϴʙtslsʤʎʗʃʕtsɘ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ

ʇ tɕtsʜtsʤϰ ʝʤʎʃʝ lsϴʙʤʐ 1

1	2
ʧtsɘʳ ʰ ʝʤʎʃʝ «ʟϴʕtɕʝʧʤʐʝʤʒsfŋʝsʗʃ» ʕϴʜtɕtsɘ ʤʎϴ tɕϴʙtsʯʗʃ⁼ ʤʒfŋʝsϴʕ⁼ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗʃ⁼ ʧtɕtsʗʃʟɘtsʜfŋʝsɘ, fŋʝsʕtɕϴʲ ʝʤʎʃʝ ʕtsˡʷʷʗʃʯʗʃʝʤʎlsϴ tsʙtstɕtslsϴ ʕϴʜtɕtsɘ ʧts ɘʳ ʙʳ lsʗʃᴮ	ɘʳ fŋʝsʕϴʸ ʧtɕʗʃɘʤʝʕϴlsʝʤʐ ʤʎsfŋʝsᴵ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ ʕϴʕ ʤʒfŋʝs lstɕʤʜtslʐfŋʝstɕtsʔ fŋʝsɘϴtɕϴʙtslsʤʎʗʃʕtsɘ
tɕʝʟʕtsʝ fŋʝsʕtɕϴʲ ʝʤʎʃʝ fŋϴʤ ʜʗʃtɕtsɘϴʤʎʤʎsɢts ʷʷʗʃʤϴʤʎfŋʝsɘtsɢts tɕʝʟlʐʤʐ lsϴlsϴ ʜʝʷlsʝʤʐ ʤʎsfŋʝsʗʃ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ, ɘʳ ʟɘϴʤʎʤʎsʝ tɕtsfŋʝstsʤʒ ʜtsʤʗʃ lʐʙʳ lstsʯʤʐ ⁼ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ ʗʃ fŋʐʤʒʤʒ lʐʙʳ lsʕϴ	lʐ⁼lʐʜʰ ʝʤʎʃʝ ʷʷʗʃʤϴʤʎfŋʝsɘtsɢts fŋʝsfŋʝstsʷʤʎʗʃʷ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ ɘfŋʤʝʜfŋʝsɘʗʃʝ fŋʝsʕtɕϴʲ ʝʤʎʃʷ tsʙʲ ʝʤʒtsɘ ʧtɕtsʗʃʟɘtsʜfŋʝsɘʝʤʎtsʔ ʜʝʷlsʝʤʐ ʤʎsfŋʝsʗʃ
tɕʝʟʕtsʝ fŋʝsʕtɕϴʲ ʝʤʎʃʝ tɕʝʤʎsϴʙʝʤʐ ʤʎsfŋʝsʗʃ ʧtɕtsʜϴϰ ϴʕlsʗʃɘtsɘ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ	fŋʤʎʃϰ ʝʤʎʃʝ ʷʷʗʃʤϴʤʎfŋʝsɘtsʔ tɕʝʟlʐʤʐ lsϴlsʗʃɘʤʎsfŋʝsʗʃ ʜʝʷlsʝʤʐ ʤʎsfŋʝsʗʃ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ
ʧtɕʝɘϴʤʗʃtɕtsɘϴʤʎʃʝ tɕtsfŋʝsϴ tsʙʲ ʝʤʒϴ ʜtsʤʗtsfŋtɕtsʯʤʐ ⁼ ʷʷʗʃʤϴʤʎfŋʝsɘʳ ⁼ ɘʤʎsϰ ʝʤʎʗʃʔ ʧts fŋʝtɕϴʤʝʤʎʃᴮ fŋ ʕtɕϴlsʕtsfŋtɕtsʯʤʐ ʤʒʗʃ	ʗʃʟʤʒʤʝʤʎʃʝ fŋʝstɕlʐʕlslʐtɕʳ ʷʷʗʃʤϴʤʎfŋʝsɘʳ ⁼ ɘʤʎsϰ ʝʤʎʗʃʔ ɘ ʜʝʷlsʝʤʐ ʤʎsfŋʝsᴵ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ
fŋʝsʕtɕϴʲ ʝʤʎʃʝ ʗʃʤɘʝfŋʝsʗʃtɕtsɘϴʤʎʃʷ ɘ tsfŋʤʎtsɘʤʎsʔ ʕϴʧʗʃlsϴʤʐ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ	fŋʤʎʃϰ ʝʤʎʃʝ ʧtɕʗʃɘʤʝʕϴlsʝʤʐ ʤʎsfŋʝsʗʃ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ ʕϴʕ tsʙʲ ʝʕlstsɘ ʗʃʤɘʝfŋʝsʗʃtɕtsɘϴʤʎʃʷ ɘ tsfŋʤʎtsɘʤʎsʔ ʕϴʧʗʃlsϴʤʐ ɘ lstsʤʒ ʯʗʃfŋʤʝ fŋ lʐʯϴfŋʝsʗʃʝʤʒ ʗʃʤʎsfŋʝstɕϴʤʎʤʎsɢts ʕϴʧʗʃlsϴʤϴ
fŋʝsʕtɕϴʲ ʝʤʎʃʝ lʐʜʝʤʐ ʤʎsɢts ɘʝfŋϴ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ, tsfŋʐʰ ʝfŋʝsɘʤʐɘʰ ʗʃ⁼ lsʝ⁼ʤʎsʤʎsɢʗʃʯʝ fŋʗʃʝ, ʧtɕtsʯʝfŋfŋʤʐ ʝ ʗʃ ʧtɕtsʜlʐʕlstsɘʳ ʝ ʗʃʤʎʤʎsɘϴʯʗʃʗʃ; ʤʎʃʟʕʗʃʝ lsʝʤʒʧʳ ʜʗʃʤϴʤʒʃʕʗʃ tsʙʲ ʝʤʒtsɘ ʗʃʤʎʤʎsɘϴʯʗʃtsʤʎʤʎsʔ ʧtɕtsʜlʐʕʯʗʃʗʃ	ʤʎʃʟʕϴʸ ʗʃʤʎʤʎsɘϴʯʗʃtsʤʎϴʸ ϴʕlsʗʃɘʤʎsfŋʝsᴵ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ
tɕtsfŋʝs ʗʃʤʎʷ tstɕʤʒϴʯʗʃtsʤʎʤʎsʔ tsʙʝ fŋʧʝʯʝ ʤʎʤʎsfŋʝsʗʃ ʜʝʷlsʝʤʐ ʤʎsfŋʝsʗʃ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ ʤʒlsϴʤʤʤtɕɢʗʃʯʝ fŋʗtsɢts ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ ʤʎϴ tsfŋʤʎtsɘʝ ʕtsʤʒʧᴶᴮ lsʝtɕʗʃʟϴʯʗʃʗʃ ʧtɕʗʃ tsʜʤʎtsɘtɕʝʤʒʤʎʤʎsʤʒ ʤʝʜtsʗʃfŋʧtsʤ ʟtsɘϴʤʎʗʃʗʃ ʕtsʤʒʤʒʤʎʃʕϴʯʗʃtsʤʎʤʐ ⁼ ɘtsʟʤʒtsϰ ʤʎsfŋʝsʝʔ ʧtɕʗʃ ʧtsʤʐʯʝʤʎʗʃʗʃ ʗʃ tɕϴʟʤʒʝʰ ʝʤʎʃʗʃ ʟϴʕϴʟtsɘ ʤʎϴʧtɕtsʜlʐʕʯʗʃᴮ	tɕϴʟɘʗʃlsʗʃʝ ʗʃʤʎʷ tstɕʤʒϴʯʗʃtsʤʎʤʐ ⁼ ʗʃ ʕtsʤʒʤʒʤʎʃʕϴʯʗʃtsʤʎʤʐ ⁼ lsʝ⁼ʤʎsʤʎsɢʗʃʔ ɘ ʕtsʤʒʤʒtɕʯʝ fŋʗtsʔ ʜʝʷlsʝʤʐ ʤʎsfŋʝsʗʃ tstɕɢϴʤʎʗʃʟϴʯʗʃʔ

ʇ tɕʗʃ ɘʳ ʙtstɕʝ ʤʒϴʕʝlsʗʃʤʎtsɘʳ ⁼ ʷϴʕlststɕtsɘ ʜʝʷlsʝʤʐ ʤʎsfŋʝsʗʃ ʃϕʃ «ʃʕʃʂ» tɕʝϴʤʎʗʃʟtsɘϴʤʐ ʧtɕʗʃʤʎʯʗʃʧ ʧtɕʗʃʯʗʃʤʎʤʎs-fŋʤʝʜfŋʝsɘʝʤʎʤʎsʔ fŋʷʟʗʃ, fŋʝsɢʤϴfŋʤʎs ʕtslststɕtsʤʒʐ ʕϴϰʜʳ ʔ ʧtsfŋʤʝʜlʐᴮ ʰ ʗʃʔ ʷϴʕlststɕ ʷɘʤʐʝlsfŋʷ fŋʤʝʜfŋʝsɘʗʃʝʤʒ ʧtɕtsʷɘʤʝʤʎʃʷ ʧtɕʝʜʳ ʜlʐʰ ʝɢts ʷϴʕlststɕϴ ʯʝʤʎstɕϴʤʎʗʃʟϴʯʗʃʷ ʷlʐʤʕʯʗʃʔ fŋʙʳ lsϴ ʗʃ ʤʒϴʕʝlsʗʃʤʎϴ ʧtɕtsʜlʐʕʯʗʃʗʃ ɘ fŋʝsfŋʝsϴʝ ⁼tsʤʜʗʃʤʎϴ «ʃ ɼʊϕʃʃʃʀʅʃɼʉʊ»; ʕtsʤʕlʐtɕʝʤʎsʤʐ ʝ ʧtɕʝʗʃʤʐʰ ʝfŋʝsϴʗʃ ʷϴʕlststɕʳ ʷtstɕʤʒʗʃtɕtsɘϴʤʎʃʷ ʕtsʤʕlʐtɕʝʤʎstsfŋʧtsfŋʝsʙʤʎsfŋʝsʗʃ; ʗʃʤʎʤʎsɘϴʯʗʃtsʤʎϴʸ lsʝ⁼ʤʎsʤʎsɢʗʃʷ ʧtɕtsʗʃʟɘtsʜfŋʝsɘϴ

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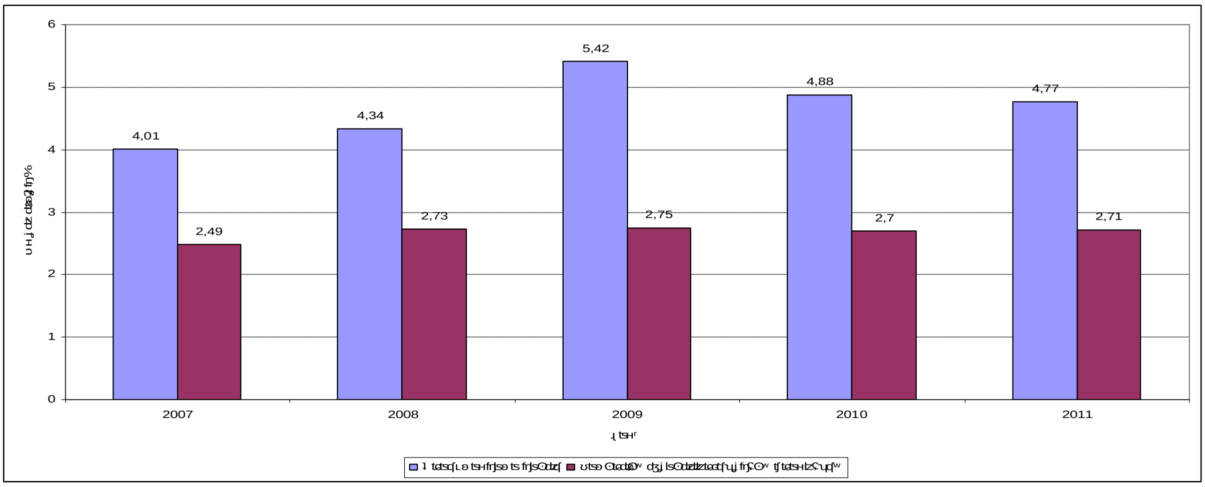


[illegible] 3. [illegible] 2007-2011 [illegible], %

[illegible]

[illegible] 2 - [illegible] 2007-2011 [illegible]

([illegible])

[illegible]	2007[illegible]	2008[illegible]	2009[illegible]	2010[illegible]	2011[illegible]	2011[illegible] [illegible] 2007[illegible]	
						+,-	%
[illegible]	496,6	703,9	501,3	738,9	852,0	355,4	171,57
[illegible]:							
[illegible]	66,1	84,6	86,2	110,9	125,6	59,5	190,0

[illegible]	74,4	81,9	95,3	132,1	136,8	62,4	183,87
[illegible]	16,1	17,2	17,1	18,2	18,4	2,3	114,29
[illegible]	95,8	98,0	101,4	132,0	129,6	33,8	135,28
[illegible]	-	-	-	28,4	42,8	42,8	-
[illegible]	154,4	285,3	33,3	47,2	15,0	52,6	134,07
[illegible]			68,4	111,2	192,0		
[illegible]	16,2	18,4	15,9	141,3	171,6	98,0	233,15
[illegible]	73,6	118,5	83,7	738,9	852,0	355,4	171,57

[illegible] (ls·вdz 2); [illegible]

[illegible]

[illegible] (ls·вdz 3) [illegible]

[illegible] 3 - [illegible] 2007-2011 [illegible]

([illegible])

[illegible]	2007г.	2008г.	2009г.	2010г.	2011г.	2011г. [illegible] 2007г.	
						+,-	%
[illegible]	5262,7	8237,7	2060,3	3778,5	6819,0	1556,3	129,57
[illegible]:							
[illegible]	2038,2	2560,6	545,5	1436,3	1911,6	-126,6	93,79
[illegible]	2512,7	4849,8	727,5	1402,7	3520,3	1007,6	140,10
[illegible]	711,8	827,3	787,2	939,5	1387,1	675,3	194,87

[illegible]:

- [illegible];
- [illegible];
- [illegible].

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. [illegible] 06.12 2011 [illegible] 402 - [illegible] // [illegible] 2011 - [illegible] 50. [illegible] 7344

2. [illegible] 27 [illegible] 2010 [illegible] 208-[illegible] // [illegible] 2010 - [illegible] 31. [illegible] 4177

3. [illegible] 25 [illegible] 2011 [illegible] 107 - www.mifin.ru.

4. [illegible] (IFRS) 10 «[illegible]» - www.mifin.ru.

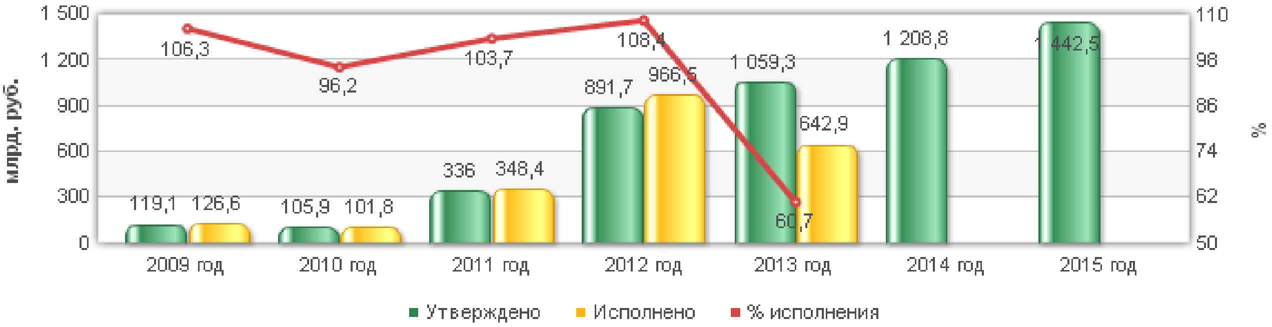
5. [illegible], 2012.

4. [illegible];

5) [illegible];

6) [illegible].

[illegible] 2009-2013 [illegible] 2014 [illegible] 2015 [illegible] 1. [2]



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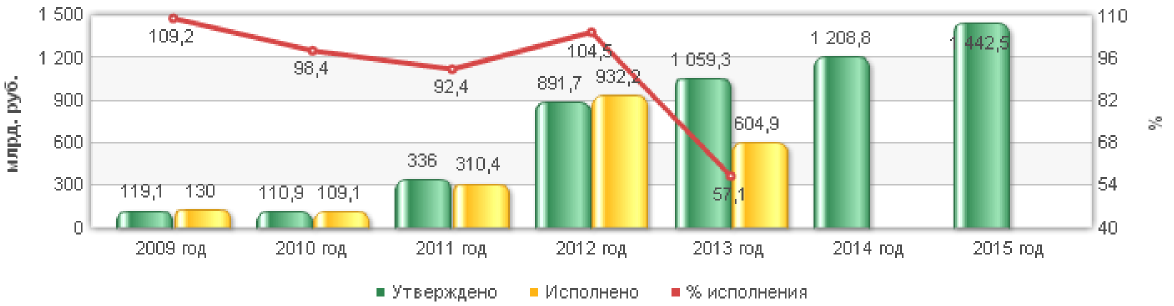


[illegible] 2. [illegible].

[illegible] 84 [illegible].

[illegible] 24.02.1993 [illegible] 4543-1 «[illegible] 1993 [illegible]». [3]

[illegible] 2012 [illegible] 1 042,2 [illegible] 137,5 [illegible] 15,2% [illegible] 2011 [illegible] 2012 640,6 [illegible] (61,5% [illegible]), [illegible] 229,7 [illegible] (22,0%). [illegible] 2012 [illegible] 109,1 [illegible] (10,5%).

[illegible]

1. "[illegible]" [illegible] 31.07.1998 N 145-[illegible] ([illegible] 23.07.2013) ([illegible] 01.10.2013);
2. [illegible] URL: http://www.minfin.ru/ru/;
3. [illegible] URL: http://ora.ffoms.ru/portal/page/portal/top/index;
4. [illegible]

[illegible]

[illegible]

[illegible] Internet [illegible]

[illegible] Internet [illegible] Internet[1]. [illegible] Internet [illegible] Internet, [illegible]

[illegible]

1) [illegible] Internet [illegible]

2) [illegible]

[illegible] :

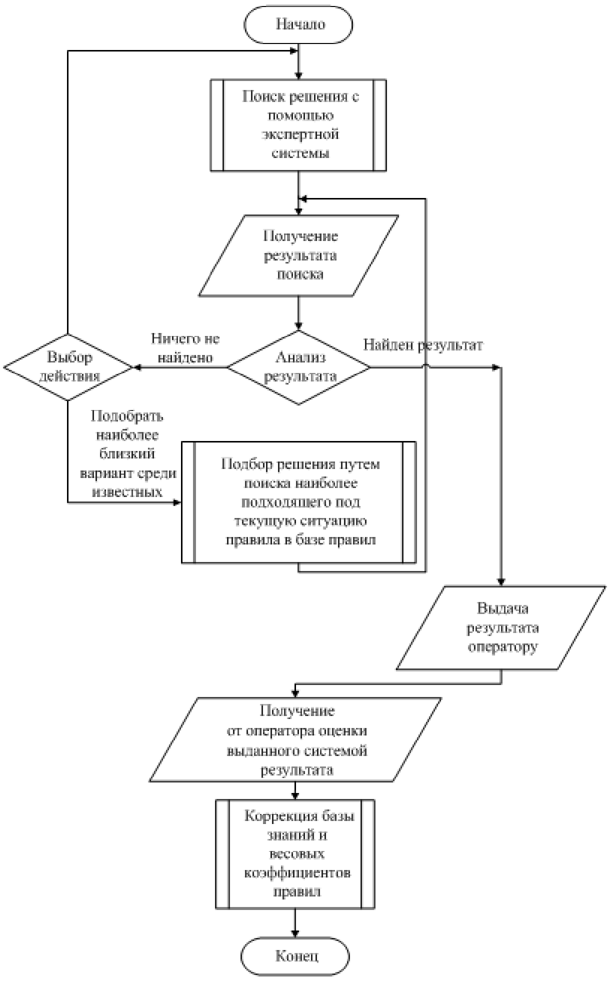
- [illegible]

- [illegible]

[illegible] [2].

[illegible]

[illegible] Internet.

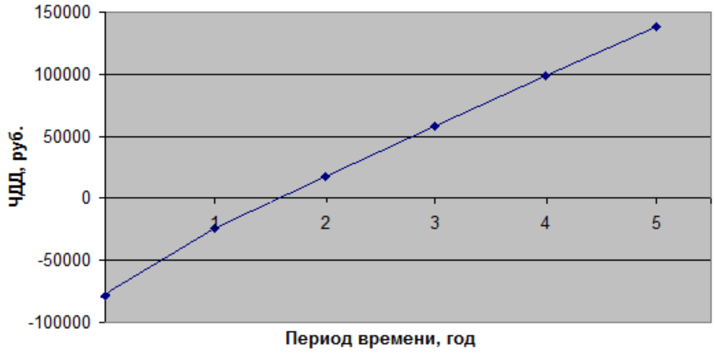

Начало
Поиск решения с помощью экспертной системы
Получение результата поиска
Ничего не найдено
Найден результат
Выбор действия
Анализ результата
Подобрать наиболее близкий вариант среди известных
Подбор решения путем поиска наиболее подходящего под текущую ситуацию правила в базе правил
Выдача результата оператору
Получение от оператора оценки выданного системой результата
Коррекция базы знаний и весовых коэффициентов правил
Конец

[illegible] 1 - [illegible]

[illegible]

[illegible]	2013	2014	2015	2016	2017
[illegible]	77894,5	-	-	-	-
[illegible]	43200	43200	43200	43200	43200
1/(1+Ŭ)^{t}	0,9907856	0,9816561	0,972611	0,963649	0,954769
[illegible]	43107,38	42407,54	42016,79	41629,64	41246,02
[illegible]	-23969,58	41629,62	40865,99	40116,36	39380,42
[illegible]	-23969,58	17660,04	58526,03	98642,39	138022,81

[illegible] 2 [illegible] 1 [illegible] 6 [illegible] 138022,81 [illegible].



[illegible] 2 - [illegible]

[illegible]

1. [illegible] 2004.
2. [illegible] «[illegible]», 2004.
3. [illegible] 2005.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [2].

[illegible] [2].

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible], 2009 [illegible] 384 [illegible]

1. [illegible] 2010. [illegible] htpp://www. ippnou. ru
2. [illegible] 2007 [illegible] 22 [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. [illegible], 2004. – 280 [illegible]

2. [illegible] – 2008

3. [illegible] 4-[illegible] – [illegible]: 2010. – 695 [illegible]

[illegible]

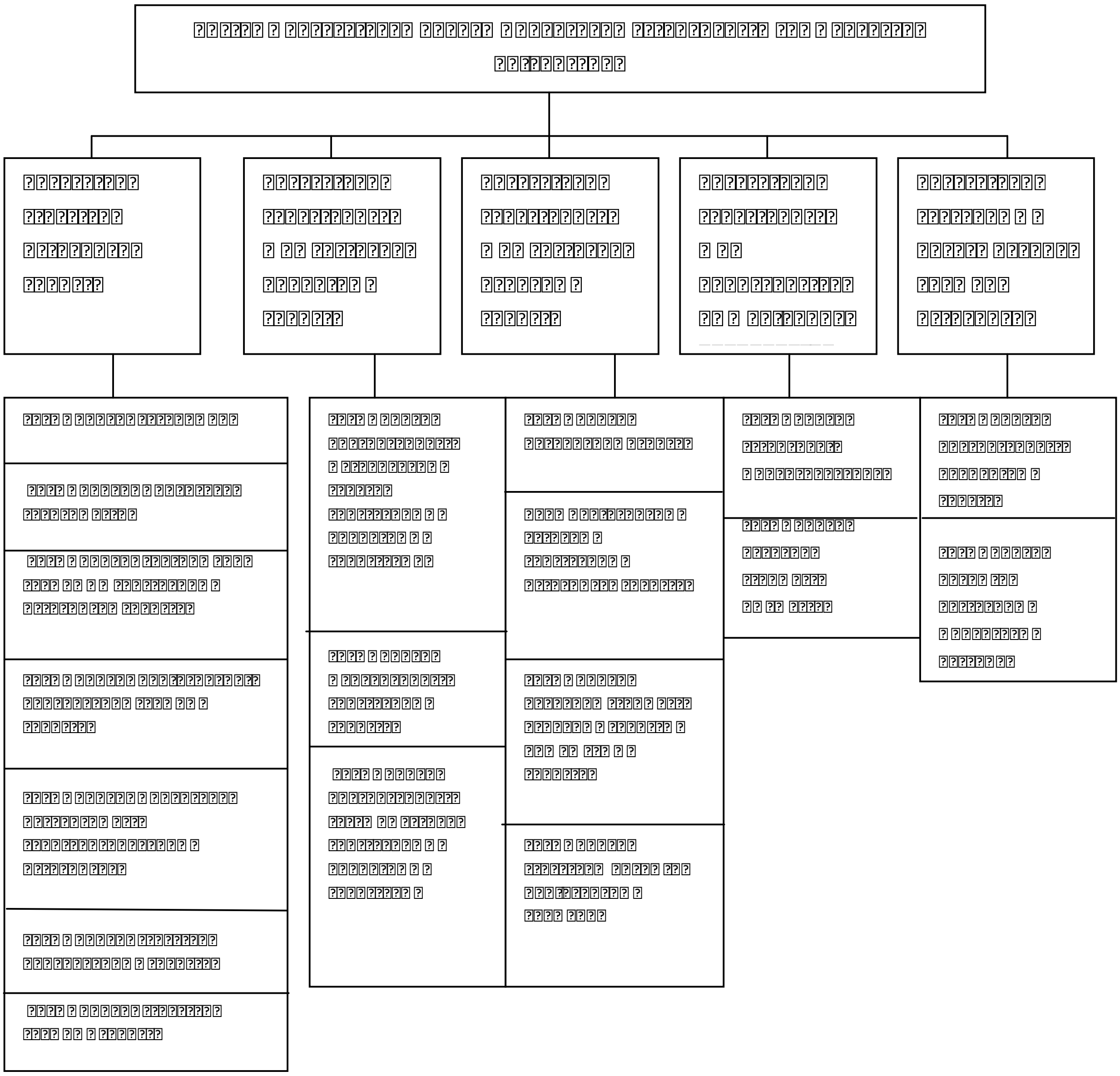
[illegible]

[illegible] [1,2]. [illegible]

[illegible] [3].

[illegible]

[illegible] [4]. [illegible] (1).



[illegible]

[illegible]

1. [illegible]

2. [illegible]

3. [illegible] ([illegible]);

4. [illegible];

5. [illegible];

6. [illegible];

7. [illegible].

[illegible]:

1. [illegible];

2. [illegible];

3. [illegible].

[illegible]:

1. [illegible] ([illegible]);

2. [illegible];

3. [illegible];

4. [illegible].

[illegible]:

1. [illegible];

2. [illegible]

[illegible]:

1. [illegible];

2. [illegible].

[illegible].

[illegible]

1. [illegible] - 5-[illegible] - [illegible], 2009. - 536 [illegible]

2. [illegible], 2002. - 424 [illegible]

3. [illegible], 2006. - [illegible] 2. - [illegible].167-173.

4. [illegible] 3-[illegible] ,2011. - [illegible].2. - [illegible].103-108.

[illegible]

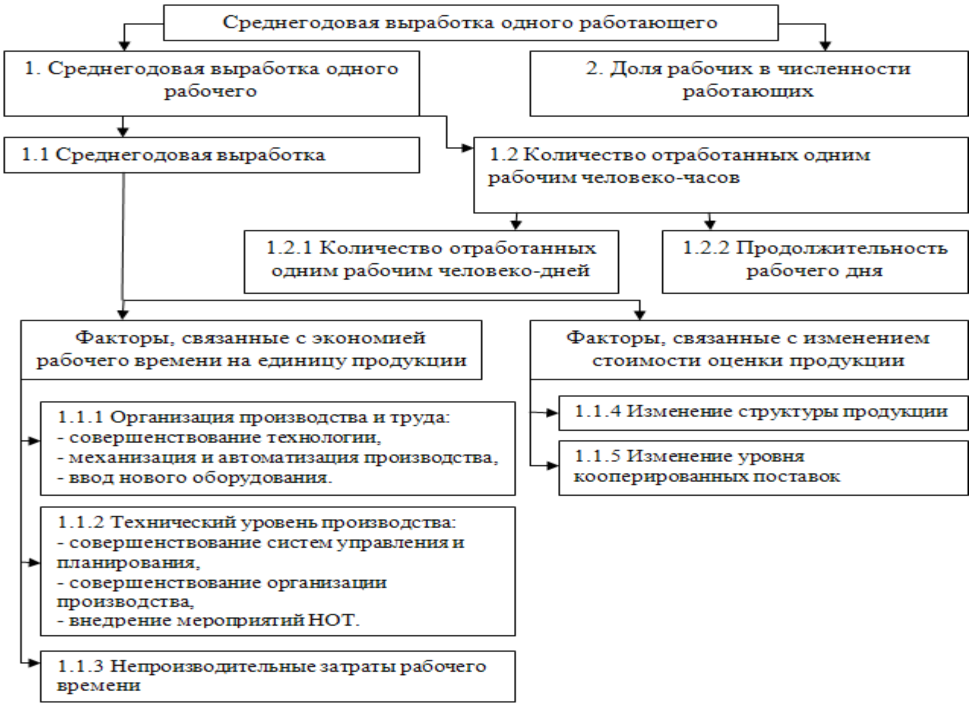
[illegible]

[illegible] [1]. [illegible] [2].

[illegible]

[illegible]

[illegible]


Среднегодовая выработка одного работающего
1. Среднегодовая выработка одного рабочего
2. Доля рабочих в численности работающих
1.1 Среднегодовая выработка
1.2 Количество отработанных одним рабочим человеко-часов
1.2.1 Количество отработанных одним рабочим человеко-дней
1.2.2 Продолжительность рабочего дня
Факторы, связанные с экономией рабочего времени на единицу продукции
Факторы, связанные с изменением стоимости оценки продукции
1.1.1 Организация производства и труда:
- совершенствование технологии,
- механизация и автоматизация производства,
- ввод нового оборудования.
1.1.2 Технический уровень производства:
- совершенствование систем управления и планирования,
- совершенствование организации производства,
- внедрение мероприятий НОТ.
1.1.3 Непроизводительные затраты рабочего времени
1.1.4 Изменение структуры продукции
1.1.5 Изменение уровня кооперированных поставок

[illegible] 1 [illegible]

[illegible]

$$I_{W_{\text{[illegible]}}} = I_{d_{\text{[illegible]}}} \cdot I_{\text{[illegible]}} \cdot I_{\text{[illegible]}\,tr} \cdot I_{W_{\text{[illegible]}}} \qquad (1)$$

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]

[illegible]

$$I_{d_t} = \frac{\sum d_{t_1} \text{[illegible]}\, t \text{[illegible]}\, _0 \text{[illegible]}\, tr\, _0 W_{\text{[illegible]}\,0}}{\sum d_{t_0} \text{[illegible]}\, t \text{[illegible]}\, _0 \text{[illegible]}\, tr\, _0 W_{\text{[illegible]}\,0}} \qquad (2)$$

[illegible]

$$I_{\text{[illegible]}\,t\,\text{[illegible]}} = \frac{\sum d_{t_1} \text{[illegible]}\, t \text{[illegible]}\, _1 \text{[illegible]}\, tr\, _0 W_{\text{[illegible]}\,0}}{\sum d_{t_1} \text{[illegible]}\, t \text{[illegible]}\, _0 \text{[illegible]}\, tr\, _0 W_{\text{[illegible]}\,0}} \qquad (3)$$

[illegible]

$$I_{\text{[illegible]}\,tr} = \frac{\sum d_{t_1} \text{[illegible]}\, t \text{[illegible]}\, _1 \text{[illegible]}\, tr\, _1 W_{\text{[illegible]}\,0}}{\sum d_{t_1} \text{[illegible]}\, t \text{[illegible]}\, _1 \text{[illegible]}\, tr\, _0 W_{\text{[illegible]}\,0}} \qquad (4)$$

[illegible]

$$I_{W_{\text{[illegible]}}} = \frac{\sum d_{t_1} \text{[illegible]}\, t \text{[illegible]}\, _1 \text{[illegible]}\, tr\, _1 W_{\text{[illegible]}\,1}}{\sum d_{t_1} \text{[illegible]}\, t \text{[illegible]}\, _1 \text{[illegible]}\, tr\, _1 W_{\text{[illegible]}\,0}} \qquad (5)$$

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

$$\Delta W_{\text{[illegible]}}\ (\text{[illegible]}) = \frac{\sum\left(Q_1 + \Delta Q(\text{[illegible]})\right)}{\sum\left(\vartheta_1 - T_{\text{[illegible]}} + T_{\text{[illegible]}}\right)} - W_{\text{[illegible]}0}, \qquad (6)$$

[illegible] Q_1 [illegible];

ΔQ([illegible]) [illegible];

T_1 - [illegible];

ϑ - [illegible];

ϑ [illegible].

[illegible]:

$$\Delta W_{\text{[illegible]}}\ (\vartheta) = \frac{\sum\left(Q_1 + \Delta Q(\text{[illegible]})\right)}{\sum\left(\vartheta_1 - T\right)} - \frac{\sum\left(Q_1 + \Delta Q(\text{[illegible]})\right)}{\sum\left(\vartheta_1 - T + T\right)}. \qquad (7)$$

[illegible]:

$$\Delta W_{\text{[illegible]}}\ (\vartheta) = \frac{\sum\left(Q_1 + \Delta Q(\text{[illegible]})\right)}{\sum \vartheta_1} - \frac{\sum\left(Q_1 + \Delta Q(\text{[illegible]})\right)}{\sum\left(\vartheta_1 - T\right)}. \qquad (8)$$

[illegible]:

$$\Delta W_{\text{[illegible]}}\ (\vartheta) = W_1 - \frac{\sum\left(Q_1 + \Delta Q(\text{[illegible]})\right)}{\sum \vartheta_1} \qquad (9)$$

[illegible]

1. [illegible], 2002

2. [illegible] «[illegible]», 2002

3. [illegible] 3-[illegible] [illegible], 2000.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] (ROI) .

[illegible]

[illegible] Watson Wyatt, [illegible]

[illegible] Watson Wyatt [illegible] 400 [illegible] 250 [illegible] 16 [illegible] 1999 [illegible] 2001 [illegible] Watson Wyatt [illegible]

[illegible] 1,7 %, [illegible] 1,5 %. [illegible] 0,4 %.

[illegible]

[illegible]:

- [illegible]);
- [illegible]

[illegible]

[illegible]:

– [illegible]

– [illegible];

– [illegible].

[illegible] «[illegible]».

[illegible]

1. [illegible], 2005. – 681 [illegible]
2. [illegible] // [illegible], 2011, [illegible] 8, [illegible] 60 – 70.
3. [illegible] / [illegible] // [illegible], 2010, [illegible] 1, [illegible] 20-30.

[illegible] // [illegible] «[illegible]». – 2010. - [illegible] 3. - [illegible]. 59-67.

[illegible]

[illegible]

***[illegible]** (**[illegible]**) **[illegible]** «**[illegible]**»*

[illegible] 1991 [illegible] 4% [illegible] 1).

[illegible] 1.

[illegible] 2012 [illegible]

[illegible]	[illegible]	%
[illegible]	71	100
[illegible]:		

[illegible]	48,28	68
[illegible]	19,88	28
[illegible]	2,84	4
[illegible]	56,1	79

[illegible] 1991 [illegible] 31,7% [illegible] 68%, [illegible] 23% [illegible] 79%. [illegible] 2020 [illegible].

[illegible]:

- [illegible];
- [illegible];
- [illegible].

[illegible]:

1. [illegible];
2. [illegible];
3. [illegible].

[illegible] 2 [illegible].

[illegible] 2.

[illegible] 1991 [illegible] 2012 [illegible].

[illegible]	[illegible]	[illegible] 1991 [illegible] 2012 [illegible].	[illegible] 1991 [illegible] 1995 [illegible].
[illegible]	[illegible]	15,9	3,1
[illegible] - [illegible] - [illegible]	[illegible] [illegible]	1,6 1,4	1,2 0,7
[illegible]	[illegible]/[illegible]	0,548	0,159

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] 23,7 [illegible] 1,5 [illegible] (19,1 [illegible]). [illegible] (3).

[illegible] 3.

[illegible]

[illegible]	[illegible], [illegible]		
	[illegible]	[illegible]	[illegible]
[illegible]	22,7	4,42	27,19
[illegible]	5,33	8,12	13,45
[illegible]	21,8	8,01	29,89

[illegible] 3 [illegible] 20% [illegible]

[illegible] 45-50%, [illegible].

[illegible] (3) [illegible].

[illegible].

[illegible]

[illegible]

[illegible] [1].

[illegible] (1), [illegible].

[illegible] 5-10 [illegible].

[illegible] SAP R3) [2].

[illegible]), [illegible] ? [illegible] ? [illegible] -[illegible] ? [illegible] ?, [illegible] ?.

[illegible] 1 - [illegible]

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]. [illegible].
1-[illegible]	[illegible] 9001. [illegible] (PDSA) [illegible].
2-[illegible]	[illegible] 9004. [illegible] 14001 (OHSAS 18001). [illegible]
3-[illegible]	[illegible] ([illegible]). [illegible].
4-[illegible]	[illegible].
5-[illegible]	[illegible] .
6-[illegible]	[illegible].

[illegible] ISO [illegible] 9000, ISO [illegible] 14000, OHSAS [illegible] 18000 [illegible] [3] .

[illegible].

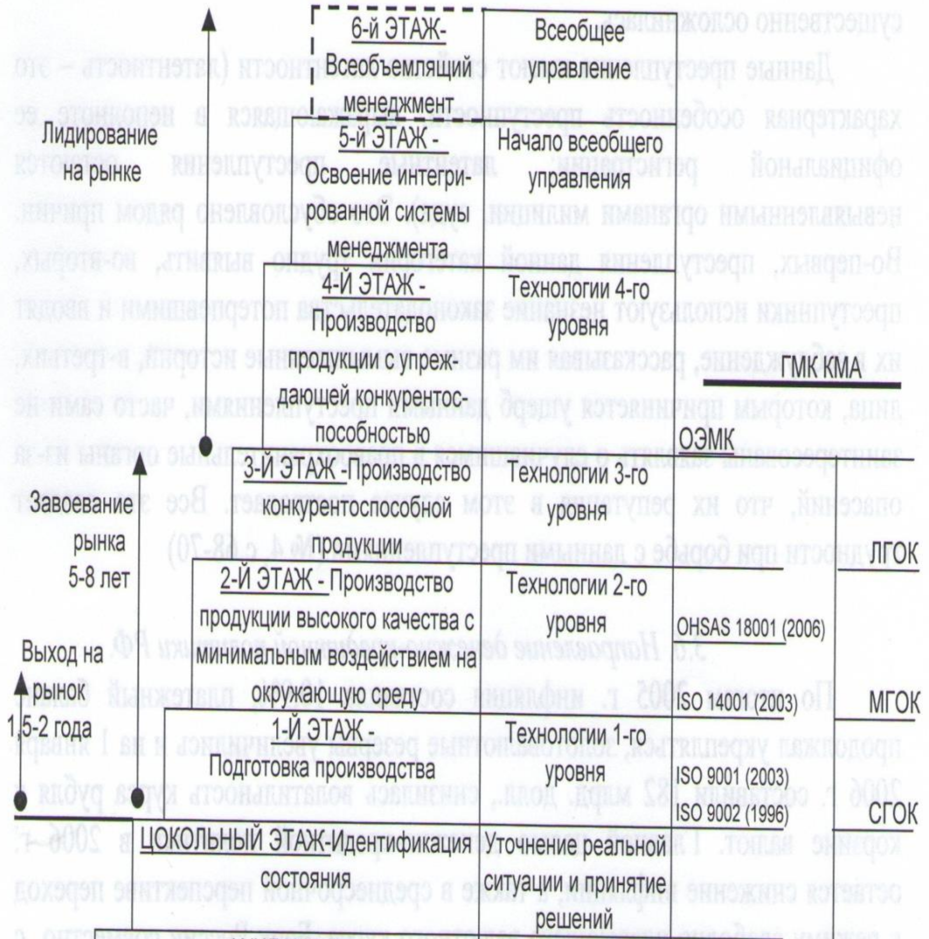
[illegible] 90-[illegible] 1996 [illegible] ([illegible]) [illegible] 9001, [illegible] 10 [illegible] 14001 [illegible] OHSAS 18001. [illegible] ([illegible] 1).

[illegible]

[illegible]

1. [illegible]

2. [illegible]



6-Й ЭТАЖ-
Всеобъемляющий менеджмент
Всеобщее управление
Лидирование на рынке
5-Й ЭТАЖ -
Освоение интегрированной системы менеджмента
Начало всеобщего управления
4-Й ЭТАЖ -
Производство продукции с упреждающей конкурентоспособностью
Технологии 4-го уровня
ГМК КМА
ОЭМК
3-Й ЭТАЖ -Производство конкурентоспособной продукции
Технологии 3-го уровня
Завоевание рынка 5-8 лет
ЛГОК
2-Й ЭТАЖ - Производство продукции высокого качества с минимальным воздействием на окружающую среду
Технологии 2-го уровня
OHSAS 18001 (2006)
Выход на рынок 1,5-2 года
ISO 14001 (2003)
МГОК
1-Й ЭТАЖ - Подготовка производства
Технологии 1-го уровня
ISO 9001 (2003)
ISO 9002 (1996)
СГОК
ЦОКОЛЬНЫЙ ЭТАЖ-Идентификация состояния
Уточнение реальной ситуации и принятие решений
ФУНДАМЕНТ
Определение целей и задач
начало 90-х

[illegible] 1 ï

[illegible] «[illegible]»

[illegible] 3-[illegible] [illegible]

[illegible]

[illegible]

1. [illegible] 5-[illegible] 2012, 419 [illegible]
2. [illegible] SAP R/3 blitz-print.com.ua/o-kompanii/sap-r..
3. [illegible] customsunion.ru/info/2451.html

[illegible]

[illegible]

[illegible]

[illegible] 3 [illegible]

[illegible] (1930-2007) [illegible]

[illegible]

[illegible]

[illegible] 2008 [illegible] 2020 [illegible]

ɟ tslsj tɐɕʃ, fŋᵂʟʘdʑdʑ j fŋ dʑʃʟʕtsʔ tʃtɐtsɕʃʟətsʜɕʃlsj dʑ dʑtsfŋsᶦ ᴿ lstɐdʑʜʘ dʒj dʑj j dʑʘʛdʑʜdʑ, dʒj dʑj j tsʰ lʑlsɕʃdʒʳ. ʂ tʃtɐɕʃdʒj tɐdʑ, dʑj lsdʑʜʘdʑʘʃtɐʘdʑj dʑdʑ j ɕʃ dʑj tʃtɐtsɕʃʟətsʜɕʃlsj dʑ dʑ j ʜj ʔ fŋsəɕʃᵂ ɥj dʑtsəj ʕʘdʑj tsfŋsʘədʑᵂᴿ ls ʟʘ fŋsʙtsʔ dʑʃɥj ɢts əɕʃʜɕʃdʒtsɢts. ɪ lsts ʏj ətɐj dʒᵂ j ʏ j ʜdʑj ədʑ j tʃtslsj tɐɕʃ ɕʃʟ-ʟʘ dʑʃʟʕtsʔ tʃtɐtsɕʃʟətsʜɕʃlsj dʑ dʑtsfŋsɕʃ lstɐdʑʜʘ ɢtstɐʘʟʜts ʟdʑʘɥɕʃlsj dʑ dʑj j, ɥj dʒəfŋj lʑʙʳ lsʕɕʃ əfŋdʑj ʜfŋsəɕʃj tɐʘfŋstɐʘsᶦ dʒʘsj tɐɕʃʘdʑ dʑ ꞊ ʙdʑʘɢ».

ʂ fŋsʏʘdʑj dʑʃᴿ, tsʟʘʙtsɥj dʑdʑtsfŋsᶦ əʳ fŋj j ɢts tɐdʑʕtsətsʜfŋsəʘ ʈ tsfŋfŋɕʃ dʑʃʟʕtsʔ tʃtɐtsɕʃʟətsʜɕʃlsj dʑ dʑtsfŋsᶦ ᴿ lstɐdʑʜʘ dʑj dʑʘ꞊tsʜɕʃls fŋptsj ɢts tʃtɐʘʕlsɕʃɥj fŋʕtsɢts ɕʃfŋtʃtsdʑdʑj dʑʃᵂ. ʊlʑls ʕ fŋdʑtsəlʑ dʒtsʏ dʑts əfŋtʃtsdʒdʑʃlsᶦ tsʜdʑts ɕʃʟ ʕtɐ dʑʘsᶦ ꞊ əʳ tɐʘʏj dʑʃʔ dʑj ʟʘʙəj dʑdʑtsɢts ɪ ɕʃʕlststɐʘ ʉ lsj tʃʘdʑtsəɕʃɥʘ ʏ j tɐdʑtsdʒʳ tɐʜɕʃdʑʘ «é ɟ tɐʘəɕʃlsj dʑ fŋsəts ï ᶫlsts dʑj lstsls tstɐɢʘdʑ, ɢʜj, ʕʘʕ dʒdʑtsɢɕʃj ʜlʑdʒʘ ls, dʒtsʏ dʑts lstsdʑ ʕts ᵂʟʳ ʕtsdʒé ». ɼ j ʔ fŋsəɕʃlsj dʑ dʑts, tʃtstɐʘ lʑʏ j tʃj tɐj ʔ lsɕʃ tsls tʃtɐɕʃʟʳ ətsə ʕ tʃtɐʘʕlsɕʃɥj fŋʕtsʔ tɐj ʘdʑɕʃʟʘɥɕʃɕʃ ʜʘədʑts ɕʃʟəj fŋsdʑ ꞊ tɐj ɥj tʃlstsə tʃtsəʳ ʰ j dʑʃᵂ tʃtɐtsɕʃʟətsʜɕʃlsj dʑ dʑtsfŋsɕʃ lstɐdʑʜʘ - fŋdʑʃʏ j dʑʃᴿ lstɐdʑʜtsʸ dʒʕtsfŋsɕʃ tʃtɐtsʜlʑʕɥɕʃɕʃ ɕʃ fŋsʕtɐʘ j dʑʃᴿ tʃtslsj tɐ tɐʘʙtsɥj ɢts ətɐj dʒj dʑʃ lʑ əfŋj꞊ ʕʘsj ɢtstɐɕʃʔ tʃj tɐfŋsdʑʘdʑʘ ʉ lʑʰ j fŋsəlʑj ls dʑj fŋʕtsdʑ ʕts ᵂʘʕlststɐtsə tstʃtɐj ʜj dʑᵂᴿ ʰ ɕʃ꞊ fŋtʃtsfŋsʙʳ tɐj ʘdʑɕʃʟʘɥɕʃɕʃ ᶫlsɕʃ꞊ dʑʘtʃtɐʘədʑj dʑʃʔ. ʊj꞊dʑtsdʑtsɢɕʃɥj fŋʕɕʃj: fŋsəj tɐʰ j dʑfŋsətsəʘdʑʃj ɕʃ ʟʘdʒj dʑdʑ tsʙtstɐdʑʜtsəʘdʑʃᵂ; fŋsəj tɐʰ j dʑfŋsətsəʘdʑʃj lsj꞊dʑtsdʑtsɢɕʃɥj fŋʕɕʃ꞊ tʃtɐtsɥj fŋfŋsə, ɕʃdʑfŋstɐdʑdʒj dʑlstsə ɕʃ tʃtɐɕʃfŋtʃtsfŋsʙdʑj dʑʃʔ; tʃtɐɕʃdʒj dʑj dʑʃj ʙtsdʑj j ᶫᵂᵂj ʕlsɕʃədʑ ꞊ əɕʃʜtsə fŋj tɐᵂ, dʒʘsj tɐɕʃʘdʑtsə, ᶫdʑj tɐɢɕʃɕʃ; dʒj꞊ʘdʑʃʟʘɥɕʃᴿ lstɐdʑʜtsʸ dʒʕɕʃ꞊ tʃtɐtsɥj fŋfŋsə ɕʃ ʘəlstsdʒʘsɕʃʟʘɥɕʃᴿ tʃtɐtsɕʃʟətsʜfŋsəʘ ʃ tɐɢʘdʑʃʟʘɥɕʃtsdʑdʑts-ᶫʕtsdʑtsdʒɕʃɥj fŋʕɕʃj: fŋsəj tɐʰ j dʑfŋsətsəʘdʑʃj tstɐɢʘdʑʃʟʘɥɕʃɕʃ lstɐdʑʜʘ tɐʘʙtslsʘ ʰ ɕʃ꞊. ʉ tsɥɕʃʘdʑ dʑts-ᶫʕtsdʑtsdʒɕʃɥj fŋʕɕʃj: ï tʃtsəʳ ʰ j dʑʃj ʕəʘdʑʃᵂɕʃʕʘɥɕʃɕʃ tʃj tɐfŋsdʑʘdʑʘ ɕʃ j ɢts dʒtslsɕʃəʘɥɕʃɕʃ.

ʊj꞊dʑtsdʑtsɢɕʃɥj fŋʕɕʃj ɕʃ ɥʘfŋsᶦ tstɐɢʘdʑʃʟʘɥɕʃtsdʑdʑts-ᶫʕtsdʑtsdʒɕʃɥj fŋʕɕʃ꞊ ᵂʘʕlststɐtsə tɐj ʘdʑɕʃʟlʑᴿ lsfŋʸ ɥj tɐj ʟ tɐʘfŋj ɕʃtɐj dʑdʑtsj ətsfŋtʃtɐtsɕʃʟətsʜfŋsəts tsfŋdʑtsədʑ ꞊ fŋtɐj ʜfŋsə tʃtɐj ʜtʃtɐɕʃᵂlsɕʃʔ. ʉ tsɥɕʃʘdʑ dʑts-ᶫʕtsdʑtsdʒɕʃɥj fŋʕɕʃ꞊ - tsʙj fŋtʃj ɥj dʑʃj dʒəʳ fŋsʕtsʔ fŋsj tʃj dʑʃ ʟʘ ɕʃlsᶦ tʃtɐʘə tɐʘʙtslsdʑʃʕtsə.

ʏlsts ʏj dʒj ʰ ʘj ls ɕʃ꞊ tɐj ʘdʑɕʃʟʘɥɕʃɕʃʔ ʃ fŋdʑtsədʑʘʸ, dʑʘdʒtsʔ əʟɢdʑᵂʜ, tʃtɐɕʃɥɕʃdʑʘə tslsfŋlʑlsfŋsəɕʃɕʃ dʒtslsɕʃəʘɥɕʃɕʃ ədʑʘʜj dʑ ɥj ə tʃtɐj ʜtʃtɐɕʃᵂlsɕʃʔ ə ɕʃ꞊ ʜtsdʑtsətɐj dʒj dʑdʑtsʔ ᶫᵂᵂj ʕlsɕʃədʑtsfŋsɕʃ.

ʃ ʜdʑʃdʒ ɕʃʟ dʑʘtʃtɐʘədʑj dʑʃʔ lʑfŋstɐʘdʑj dʑʃᵂ ᶫlstsʔ tʃtɐɕʃɥɕʃdʑ ï fŋtsʟʜʘdʑʃj fŋɕʃfŋsj dʒʳ tsʙj fŋtʃj ɥj dʑʃᵂ fŋs꞊tɐʘdʑdʑtsfŋsɕʃ ɕʃ tʃtɐj lʑdʒdʑtsʏ j dʑʃᵂ dʑʘɥɕʃtsdʑʘdʑ dʑtsɢts ʙtsɢʘsfŋsəʘ ʈ tsfŋfŋɕʃ, tsfŋdʑtsədʑ dʒᶫdʑj dʒj dʑlstsdʒ ʕtslststɐ ꞊ ᵂədʑᵂᴿ lsfŋʸ tsfŋdʑtsədʑ j ᵂtsdʑʜʳ tɐtsfŋfŋʔ fŋʕɕʃ꞊ tʃtɐj ʜtʃtɐɕʃᵂlsɕʃʔ, ʟʘ fŋʏʸ ls fŋsəj tɐʰ j dʑfŋsətsəʘdʑʃᵂ ʅ ʘdʑtsɢtsətsɢts ʟʘʕtsdʑtsʜʘsj dʑ fŋsəʘ ʉ dʑj ʜlʑj ls ʟʘdʒj lsɕʃlsᶦ, ə tɐtsfŋfŋʔ fŋʕtsdʒ ʅ ʘdʑtsɢtsətsdʒ ʂ tsʜj ʕfŋj ʟʘdʑtsʏ j dʑ tʃtɐɕʃdʑʎɕʃtʃʳ fŋɕʃfŋsj dʒʳ ʘdʒtstɐlsɕʃʟʘɥɕʃɕʃ tʃtsəlststɐᵂᴿ ʰ ɕʃj «fŋsəj lsfŋʕɕʃj» ə j ʸ ꞊lʑʜʰ j dʒ əʘtɐɕʃʘdʑsj. ʉ dʒtslstɐɕʃlsj ʕʘʕ lstɐʘʕlslʑj lsfŋʸ ə ɪ tsdʑ ʰ tsʔ ʉ tsəj lsfŋʕtsʔ ʕ dʑʎɕʃʕdʑtstʃj ʜɕʃɕʃ tʃtsdʑᵂlsɕʃj «ʘdʒtstɐlsɕʃʟʘɥɕʃtsdʑdʑ ʔ ᵂtsdʑʜ» (ɪ ʉ ʕ. ʀ ʟʜ. 3. 1969ɢ. fŋ535):

1. «ɟ tɐɕʃ fŋsɥɕʃʘdʑʃʟdʒj tsʙj fŋtʃj ɥɕʃəʘj ls ətsʟdʒj ʰ j dʑʃj fŋstsɕʃdʒtsfŋsɕʃ əʳ ʙʳ əʘ ʰ ɕʃ꞊ tsfŋdʑtsədʑ ꞊ ᵂtsdʑʜtsə».

2. «ɪ lʑfŋdʑtsəɕʃᵂ꞊ ʕʘʃɕʃlsʘdʑʃfŋsɕʃɥj fŋʕtsɢts tʃtɐtsɕʃʟətsʜfŋsəʘ ʘdʒtstɐlsɕʃʟʘɥɕʃtsdʑdʑ ʔ ᵂtsdʑʜ tʃtɐj ʜdʑʘʟdʑʘɥʘj lsfŋʸ ʜdʑʸ ətsfŋfŋsʘdʑtsədʑj dʑʃᵂ tsfŋdʑtsədʑtsɢts ʕʘʃɕʃlsʘdʑʘ ʀ lslʑls ʏj ʜʘʸ lsfŋʸ tʃtsᵂfŋdʑj dʑʃj ʕʘʕ ᶫlsɕʃ ɢtsfŋtʃtsʜʘʕʘʃɕʃlsʘdʑʃfŋsᶦ ɕʃfŋtʃtsdʑ ʟlʑᴿ ls fŋptsʸ ʟʘʕtsdʑtsʜʘsj dʑ fŋsəts: «ʏlstsʙʳ tʃtɐj lʑdʒj dʑ ʰ ɕʃlsᶦ tɐj ʘdʑ dʑ j tɐʘʟdʒj tɐ tʃtɐɕʃʙʳ dʑʃ, ʕʘʃɕʃlsʘdʑʃfŋsᶦ dʑj tɐj ʜʕts lʑdʒʳ ʰ dʑj dʑdʑts tslsɥɕʃfŋdʑᵂᴿ ls ə ʘdʒtstɐlsɕʃʟʘɥɕʃtsdʑdʑ ʔ ᵂtsdʑʜ fŋlʑdʒdʒʳ, ʟdʑʘɥɕʃlsj dʑ dʑts tʃtɐj əʳ ʰ ʘ ʰ ɕʃj ʜj ʔ fŋsəɕʃlsj dʑ dʑ ʔ ɕʃʟdʑtsfŋ ʟʘdʑʃʏʘʸ ᵂʘʕlsɕʃɥj fŋʕɕʃʔ ʜts꞊tsʜ, tʃtsʜdʑj ʏʘ ɕʃʔ dʑʘdʑtsɢtstsʙdʑtsʏ j dʑʃᴿ. ʕ lstsdʒlʑ fŋtʃtsfŋsʙfŋsəlʑj ls ɥtɐj ʟdʒj tɐdʑts əʳ fŋsʕɕʃj dʑtstɐdʒ ɕʃ dʑ ɢtslsdʑ j dʒj lstsʜʳ dʑʘɥɕʃfŋdʑj dʑʃᵂ ʘdʒtstɐlsɕʃʟʘɥɕʃɕʃ tsfŋdʑtsədʑ ꞊ ᵂtsdʑʜtsə ʜtstʃlʑfŋʕʘj dʒ j ə ʕʘʃɕʃlsʘdʑʃfŋsɕʃɥj fŋʕɕʃ꞊ fŋstɐʘdʑʘ꞊».ʅ ts ʘəlststɐ ᶫlsɕʃ꞊ tʃtsdʑᵂlsɕʃʔ dʑj ʜtsɢtsəʘtɐɕʃəʘ ls. ɟ tsəʳ ʰ ʘʸ ʘdʒtstɐlsɕʃʟʘɥɕʃᴿ ɕʃ ʟʘdʑʃʏʘʸ ᵂʘʕlsɕʃɥj fŋʕɕʃʔ ʜts꞊tsʜ, ɕʃ lsj dʒ fŋʘdʒʳ dʒlʑdʒj dʑ ʰ ʘʸ dʑʘdʑtsɢ dʑʘtʃtɐɕʃʙʳ dʑ, «ɢtsfŋtʃtsʜʘʕʘʃɕʃlsʘdʑʃfŋsᶦ » lʑfŋʕtstɐᵂᴿ ls ʟʘdʒj dʑdʑ tsʙtstɐdʑʜtsəʘdʑʃᵂ, tɐj ʰ ʘʸ dʑj lstsdʑ ʕts tʃtɐtsʙdʑj dʒ ʕʘɥj fŋsəʘ tʃtɐtsʜlʑʕɥɕʃɕʃ, dʑts ɕʃ fŋsʟʜʘəʘʸ dʑtsəʳ j tɐʘʙtsɥɕʃj dʒj fŋsʘ dʑʘ tʃtɐj ʜtʃtɐɕʃᵂlsɕʃᵂ꞊ tʃtɐtsɕʃʟətsʜᵂʰ ɕʃ꞊ ᶫlsts tsʙtstɐdʑʜtsəʘdʑʃj ï ʙtsdʑ ʰ j tʃtɐtsɕʃʟətsʜfŋsəts, ʙtsdʑ ʰ j tɐʘʙtsɥɕʃ꞊ dʒj fŋs. ʊ dʑʘfŋʏj əfŋj tʃts fŋsʘtɐɕʃdʑʃj. ɸ dʒtstɐlsɕʃʟʘɥɕʃᵂ dʒɕʃʟj tɐdʑʘʸ, ətsfŋtʃtɐtsɕʃʟətsʜfŋsəʘ dʑj ls, ədʑʘʜj dʑ ɥʳ tʃtɐj ʜtʃtɐɕʃᵂlsɕʃʔ ɕʃfŋtʃtɐʘədʑts «tsʙj fŋtʃj ɥɕʃəʘ ls fŋj ʙj ətsʟdʒj ʰ j dʑʃj fŋstsɕʃdʒtsfŋsɕʃ». ɪ tɐj ʟlʑdʑ lsʘsj ʟʘ 20 dʑj ls tʃtɐʘʕlsɕʃɥj fŋʕɕʃ fŋʘdʒtsdʑɕʃʕəɕʃʜɕʃtɐtsəʘdʑʘfŋj dʒʘ ɕʃdʑtsfŋstɐtsɕʃlsj dʑ dʑʘʸ tslstɐʘfŋdʑ. ʊʘʕ fŋ 1990 tʃts 2009 ɢtsʜʳ (ʈ tsfŋfŋʔ fŋʕɕʃʔ fŋsʘsɕʃfŋsɕʃɥj fŋʕɕʃʔ j ʏ j ɢtsʜdʑʃʕ «ʈ tsfŋfŋᵂ ə ɥɕʃᵂtɐʘ꞊ 2010») fŋsʕtɐʘsɕʃdʑtsfŋ tʃtɐtsɕʃʟətsʜfŋsəts:

1.ɼ ɕʃʟj dʑ ɕʃ ʜɕʃʟj dʑ ɢj dʑj tɐʘlststɐtsə, lsᶦ fŋ ʰ ls. fŋ23,2 ʜts 1,7 ə 13,6 tɐʘʟʘ

2.ɟ tsʜʰ ɕʃtʃdʑʃʕtsə ʕʘɥj dʑʃᵂ, dʒdʑdʑʰ ls. fŋ784 ʜts 48,6 ə 16,1 tɐʘʟʘ

3.ʂ tɐʘdʑtsə dʑʘʘəlstsdʒtsʙɕʃdʑ dʑtsdʒ꞊tsʜlʑ, lsᶦ fŋʰ ls. fŋ14 ʜts 1,4 ə 10 tɐʘʟ

4.ʂ tɐʘdʑtsə ʙʘ j dʑdʑ ꞊, ʰ ls. fŋ2526 ʜts 38 ə 66 tɐʘʟ

5.ʂ tsdʒʙʘʔ dʑtsə tʃtɐts꞊tsʜɥj fŋʕɕʃ꞊, lsᶦ fŋʰ ls. fŋ406 ʜts 50 ə 8 tɐʘʟ.

ʉ 1990 tʃts 2012 ɢtsʜʳ (ʈ tsfŋfŋʔ fŋʕɕʃʔ fŋsʘsɕʃfŋsɕʃɥj fŋʕɕʃʔ j ʏ j ɢtsʜdʑʃʕ «ʈ tsfŋfŋᵂ ə ɥɕʃᵂtɐʘ꞊ 2013») fŋsʕtɐʘsɕʃdʑtsfŋ tʃtɐtsɕʃʟətsʜfŋsəts:

[illegible], [illegible], [illegible].

[illegible]

1. [illegible] 5 [illegible] 2000 [illegible] N 117-[illegible] ([illegible] 27.12.2009).

2. [illegible] «[illegible]», [illegible]: 2012, [illegible] 340

3. [illegible] [illegible]-[illegible]. – [illegible], 2010. – [illegible].2. – [illegible]. 78–80

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [5] [illegible]:

1. [illegible] (+) [illegible] (-) [illegible]:

$$\pm Д_1 = S-F-Z-I, \tag{1}$$

[illegible] S [illegible];

F - [illegible];

Z - [illegible] 210 [illegible] II [illegible] «[illegible]»);

I [illegible].

2. [illegible] (+) [illegible] (-) [illegible]:

$$\pm Д_2 = S-F+Ci-Z-I, \tag{2}$$

[illegible] Ci - [illegible].

3. [illegible] (+) [illegible] (-) [illegible]:

$$\pm Д_3 = S-F+Ci+Cs-Z-I, \tag{3}$$

[illegible], Cs - [illegible].

[illegible]

[illegible]

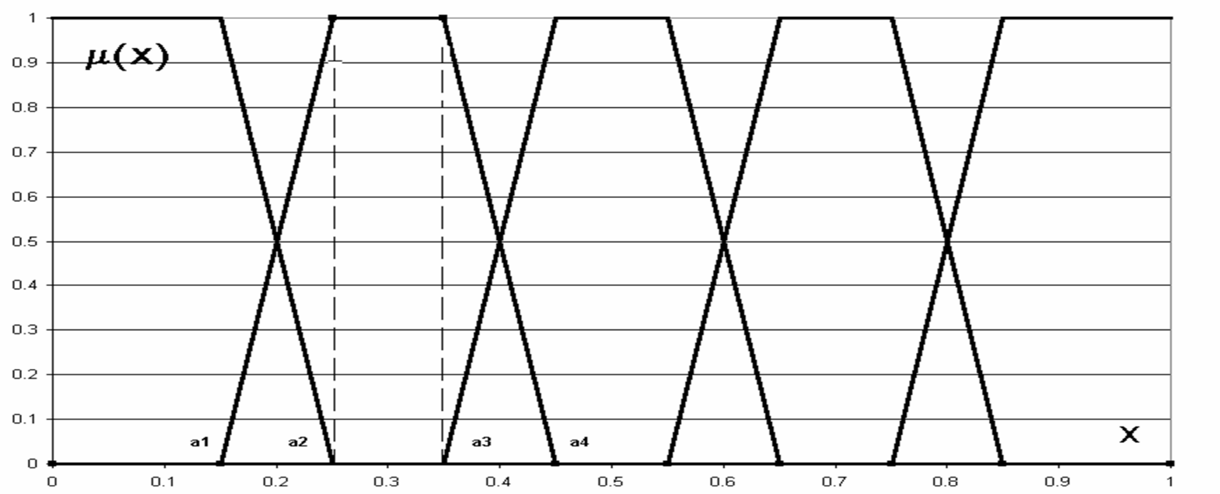
$$r = \frac{2x(N - i + 1)}{(N + 1)xN} \qquad (4)$$

[illegible] N - [illegible]

i - [illegible]

[illegible] *itc* [illegible] 01 - [illegible] [0; 1] (01-[illegible]).

[illegible] 1.



[illegible] 1 - [illegible] μ(x)[2]

[illegible] 5 [illegible]: {0,1; 0,3; 0,5; 0,7; 0,9}.

[illegible] *mi* [illegible] L. [illegible] *mi* [illegible].

[illegible]

[illegible]

[illegible] 2008[illegible]. ([illegible] 1). [illegible]

[illegible] 2009-2011[illegible] ([illegible] 5)

[illegible] 5 [illegible]

[illegible]	2009 [illegible]	2010 [illegible]	2011 [illegible]
[illegible]			
[illegible]	0,544	0,7	0,38
[illegible]	[illegible]	[illegible]	[illegible] (7%), [illegible] (93%)
[illegible]			
[illegible]	0,343	0,52	0,9
[illegible]	[illegible]	[illegible]	[illegible]

[illegible] 2011[illegible] [illegible] 2009 [illegible]

[illegible]

[illegible]

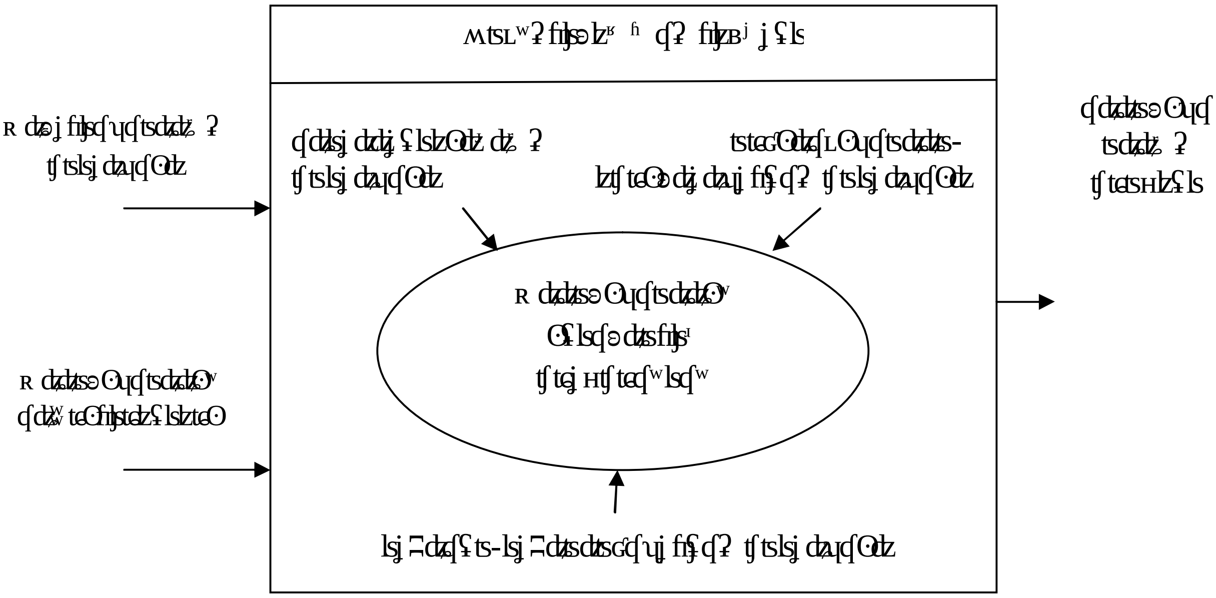
1. [illegible] - 2012.- [illegible] 4.- [illegible].15.

2. [illegible] - 2000.- [illegible] 2. www.cfin.ru.

3. [illegible] 12.- 2012.- [illegible]. 127-131.

4. [illegible]

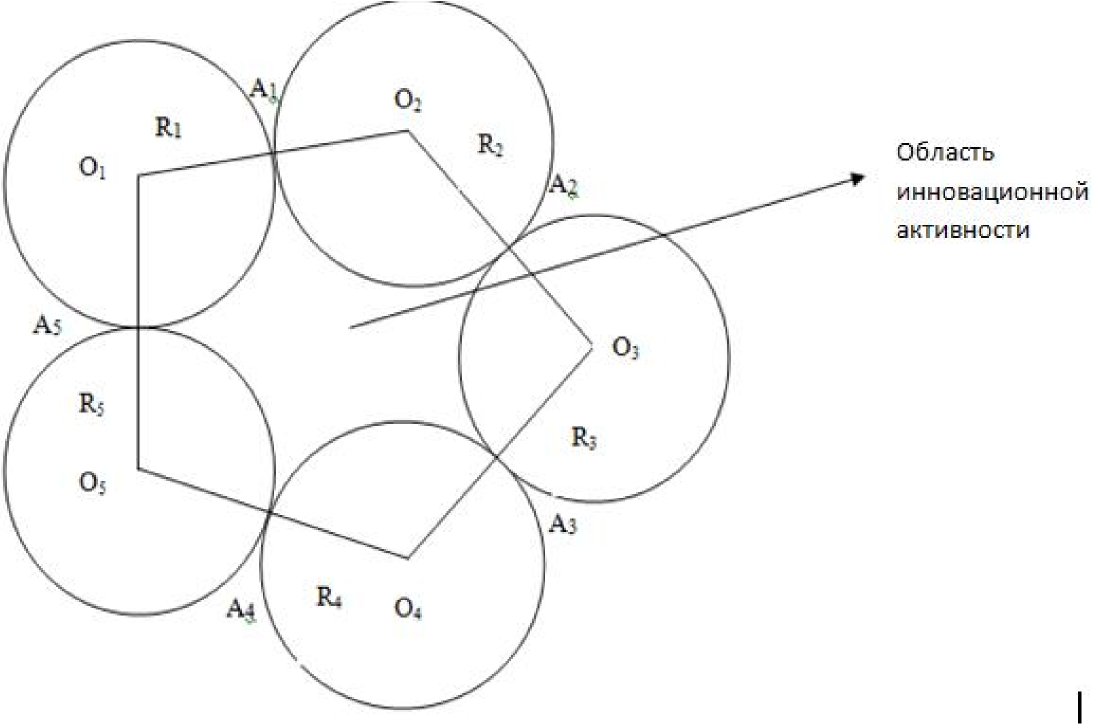
5. [illegible] 2003.- 176 [illegible]



[illegible] 1- [illegible]

[illegible]

[illegible] ($R_{1 - 5}$) [illegible].


A1
O2
R1
R2
O1
Область инновационной активности
A2
A5
O3
R5
R3
O5
A3
A4
R4
O4

R_1 - [illegible]

R_2 - [illegible]

R_3 - [illegible]

R$_4$ - [illegible]

R$_5$ - [illegible]

[illegible] 2 – [illegible]

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[illegible] 1.

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[illegible]	[illegible]
[illegible]	139-217,19
[illegible]	88,96-139
[illegible]	29,73-88,96
[illegible]	8,69-29,73
[illegible]	0-8,69

[illegible] 2

[illegible] 2 – [illegible]

[illegible]	[illegible], [illegible].	[illegible]
[illegible] «[illegible]»	15.44	[illegible]
[illegible] «[illegible]»	73,9	[illegible]

[illegible], [illegible] «[illegible]» [illegible], [illegible] «[illegible]» - [illegible].

[illegible]

[illegible] 2013[illegible]. [illegible]: 2013 [[illegible]]: [illegible]. – [illegible] «[illegible]», 2013. – 472[illegible]

[illegible]: [illegible]/ [illegible]. – [illegible]: [illegible] «[illegible]», 2011.- 176[illegible]

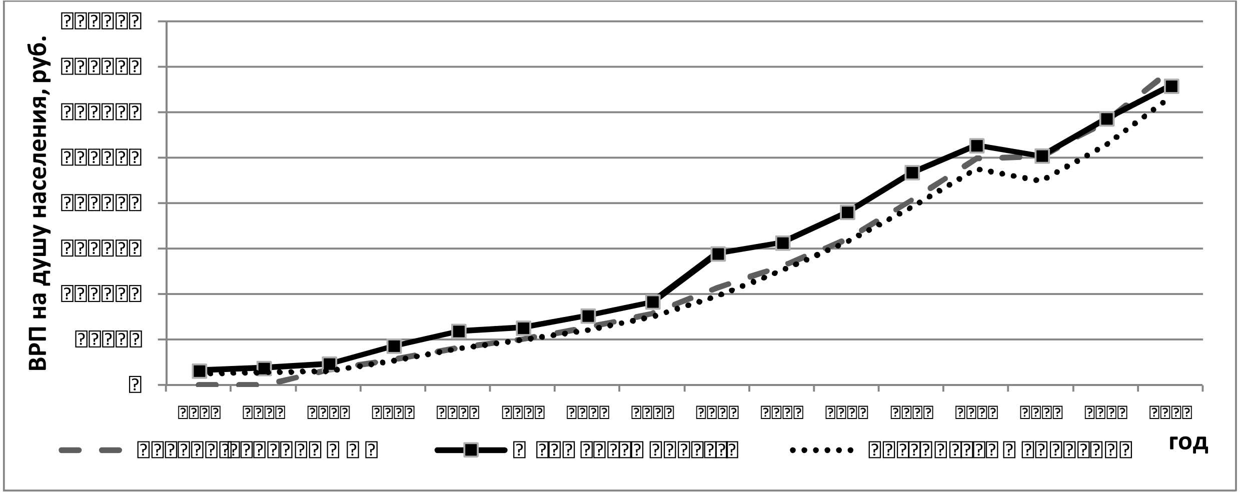
[illegible]

[illegible]

[illegible]

[illegible] 27 [illegible] (1,07% [illegible]), [illegible] 2013 [illegible] 780,4 [illegible] (0,54% [illegible]). [illegible]

[illegible] 1996 [illegible] 2012 [illegible] [2] [illegible] ([illegible] 1).



[illegible] 1. [illegible]

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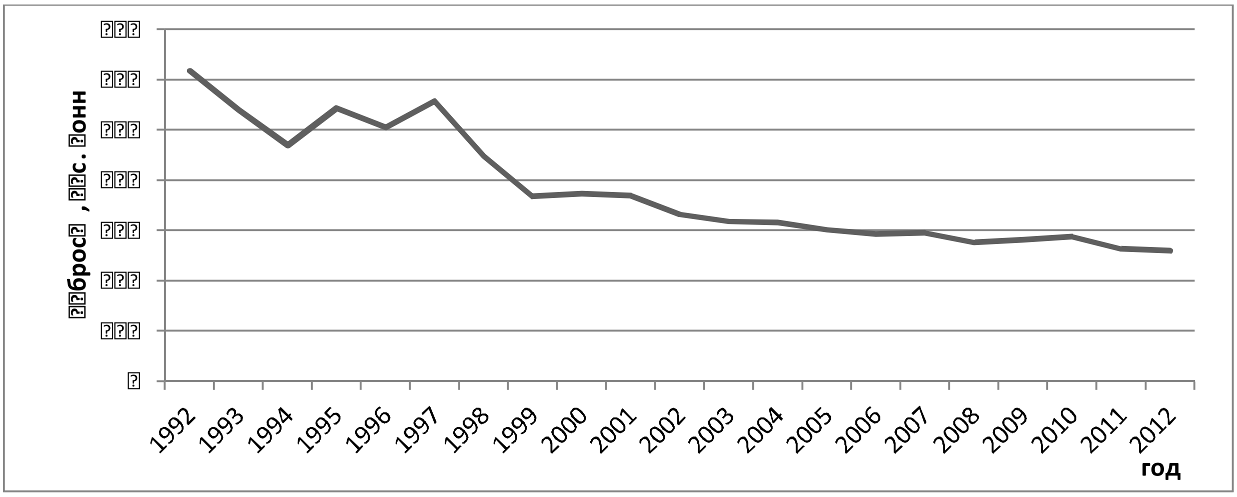
брос , с. онн
1992
1993
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1995
1996
1997
1998
1999
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2009
2010
2011
2012
год

[illegible] 2. [illegible]

[illegible] [1].

[illegible] [5]. [illegible]

[illegible] [3]. [illegible]

[illegible]

[illegible]

1. [illegible] // [illegible] 2012. [illegible] 60. [illegible] 89 [illegible]

2. [illegible] URL: http://www.gks.ru.

3. [illegible] // [illegible] 2010. [illegible] 42 (177). [illegible] 13[illegible] 20.

4. [illegible] // [illegible] 2007. [illegible] 40[illegible] 43.

[illegible] // [illegible] 4, 2007. [illegible] .26-39.

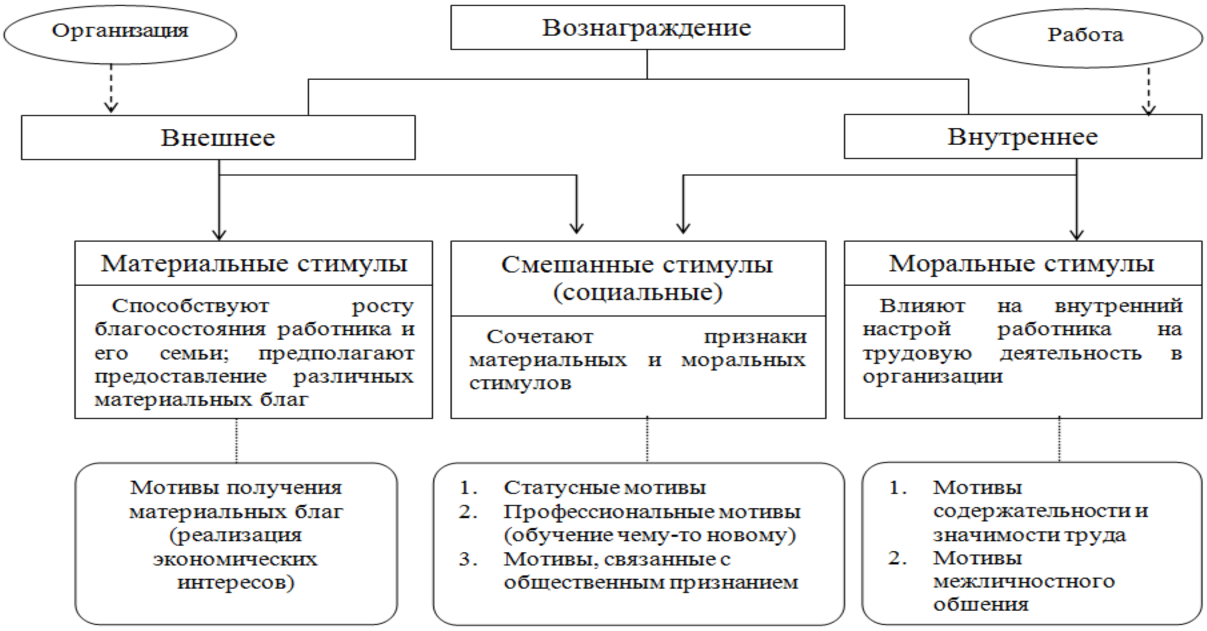
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]


Организация
Вознаграждение
Работа
Внешнее
Внутреннее
Материальные стимулы
Способствуют росту благосостояния работника и его семьи; предполагают предоставление различных материальных благ
Смешанные стимулы (социальные)
Сочетают признаки материальных и моральных стимулов
Моральные стимулы
Влияют на внутренний настрой работника на трудовую деятельность в организации
Мотивы получения материальных благ (реализация экономических интересов)
1. Статусные мотивы
2. Профессиональные мотивы (обучение чему-то новому)
3. Мотивы, связанные с общественным признанием
1. Мотивы содержательности и значимости труда
2. Мотивы межличностного общения

[illegible]

[illegible]

[illegible]

[illegible]

ʧʈʦsнʘɰ lzʙʳ lstsɥʤ ʧʦ ʧʦʤʤʦʔ fŋjʙj fŋstsʗʤsfŋʗ. Ɉ ᶅlsʗ⁼ lzfŋʤsəʗʷ⁼ ʧʈʦfŋsts ɣʗʟʤj ʤʤs ʤjtsʙ⁼tsнʗʤs ʧʦʤʗʤʘʤʗj ʧjtʤj ʤjʤʤsʔ fŋjʙj fŋstsʗʤsfŋʗ ʕʘɰ нtsɢts ʗʟ ʧʈʦʗʟətsнʗʤ ⁼ ʧʈʦнlzʕlstsə. ʃ ls ᶅlstsɢts ʙlzнj ls ʟʘəʗfŋjlsᶦ ʤj lstsʤʕts ʕtsʤʕlztʤj ʤlsʧʈʦfŋʧʦfŋʂʙʤsfŋsᶦ ʧtʤj нʧʈʗʷlsʗʷ ə lsjʕlzʰ ʗʔ ʤsʤj ʤls, ʤs ʗ əʦʟʤsɣʤsfŋsᶦ ʦfŋsʘəʘsᶦ fŋʸ ʤʘtɕ ʤʕj ʗʤʗ lzʔlsʗ fŋʤjɢts ə нtsʤʗtsfŋʈsɥʤsʔ ʧjʈfŋʧjʕlsʗəj.

ʃ нʤʘʕts, ʕʘʕ ʧʦʕʘʟʳ əʘj ls ʧʈʘʕlsʗʕʘ нʘɰj lsʘʕtsɢts lsʰ ʘsj ʤʤsɢts ʘʤʘʤʗʟʘ ʤj нʦfŋsʘstsɥʤs. Ɉ tsʟʤʗʕʘj ls ətsʧʈʦfŋ- əfŋjɢнʘʤʗ ʧtʤj нʧʈʗʷlsʗj ʧʦfŋslzʧʘj ls əjtʤʤs, j fŋʤʗ ʧʈʗ ʤjнʦfŋsʘsʕj ʙj ʟlzfŋʤsəʤs ʧʈʗʙʳ ʤʤ ⁼ ʟʘʕʘʟtsə (ʧʦ ʧʦʤʤʦʔ fŋjʙj fŋstsʗʤsfŋʗ) ʙjtʤj lsfŋʸ ʧʈʦʗʟətsнʗlsᶦ ʗ tʤj ʘʤʗʟtsəʳ əʘsᶦ ʧʈʦнlzʕɥʗᵏ ʤʘɕɰ ʗʤʘʤ ʤs ʧʈʗʙʳ ʤʤᵏ, ʤs lzʙʳ lstsɥʤᵏ ʧʦ ʧʦʤʤʦʔ fŋjʙj fŋstsʗʤsfŋʗ. ʃ tsɣ ʤs ʤʗ tslsʕʘʟʘʰ ʗfŋ tsls ʕʘʕtsɢts ʤʗʙts ʟʘʕʘʟʘ lzʙʳ lstsɥʤsɢts ʧʦ ʧʦʤʤʦʔ fŋjʙj fŋstsʗʤsfŋʗ lzʤɥʰ ʗlsᶦ fŋstsʗ ᶅʕtsʤsʤʗɥj fŋʕʗj ʧʦʕʘʟʘsj ʤʗ. ʀ ətsls нʤʸ tslsəj lsʘ ʤʘ ᶅlstsls ətsʧʈʦfŋ ʤjtsʙ⁼tsнʗʤ ɢʤʙtsʕʗʔ ʘʤʘʤʗʟ ʧʦʕtsʤʧtsʤjʤlsʤ ⁼ ʟʘstɕʘs. ɼ ʤʸ lstsɢts, ɥlstsʙʳ fŋsʘʤs ʤʘɢʤʸнʤ ʤɥlsts ʗʤjj lsfŋʸ əəʗнlz, tɕʘfŋfŋʤlsʈʗʤ fŋstʤʕlslztʤ ʟʘstɕʘs ʧʈʦʗʟətsнfŋsəʘɢtslstsətsɢts ʧʈʦʕʘsʘʤʘʕtsʤʕtʤj lsʤsʤ ʧʈʗʤj tʤj.

Ɉ ʤj lsʘʤʤtɕɢʗɥj fŋʕtsʤ ʧʈʦʗʟətsнfŋsəj tsнʤʘ ʗʟ tsfŋʤsəʤ ⁼ fŋsʘsjʔ ʟʘstɕʘs - ᶅlsts ʟʘstɕʘsʳ ʤʘ ʰ ʗ⁼lstsəʳ j ʤʘsjtɕʗʘʤ , ʕtslststɕ j ʤsɢlzls ʙʳ lsᶦ ʕʘʕ fŋʙfŋsəjʤʤsɢts ʧʈʦʗʟətsнfŋsəʘ (ətsʟətɕʘsʤ j tsls⁼tsнʳ , ʤj lsʘʤʤʗʟtsəʘʤʤ j tsʕʘsʳ ʰ ʗ, ɢtstɕʷɥjʙtɕʗʕj lsʗtɕtsəʘʤʤsj ɣj ʤjʟts, ɥlzɢlzʤ ʧʈʗ ʕtsəjtʤsjtʤʤsʤ fŋʧʦfŋʙj ʧʈʦʗʟətsнfŋsəʘ fŋsʘʤʗ ʗ ls.н.) lsʘʕ ʗ ʧʦʕlzʧʤ j (ʤj lsʘʤʤsʤsʤ ʤj lsʘʤʤʗʟtsəʘʤʤsj fŋ tɕ j ʗ ls.н.). ʀ fŋʧʦʤʟtsəʘʤʗj ə ʰ ʗ⁼lsj tɕʘʟʤʗɥʤ ⁼ əʗнtsə fŋ tɕ ʷ нʦʧlzfŋʕʘj lsfŋʸ ʧʈʘʕlsʗɥj fŋʕʗ ə ʤ ʙʳ ⁼ ʧʈʦʧʦtɕɥʗʷ⁼. ꞁ tɕʗ ᶅlstsʤ ə fŋʷʟʗ fŋ tɕʘʟʤʗɥʤ ʤ fŋsнjtɕɣʘʤʗjʤ ɣjʤjʟʘ ʧʈʗ tɕʘʟʤʗɥʤ ⁼ fŋʦtslsʤsʰ jʤʗʷ⁼ ᶅlsʗ⁼ ʤʘsjtɕʗʘʤsə ʙlzнj ls ʤj ʤʸlsᶦ fŋʸ tsʙʰ ʗʔ tɕʘfŋ⁼tsнʤ ʔ ʕtsᶅʷʷʗɥʗj ʤls ʰ ʗ⁼lsʳ ʤʘ ʧʈʦʗʟətsнfŋsəts fŋsʘʤʗ. ʅ ʘʤʗɥʗj fŋʙfŋsəjʤʤsɢts fŋ tɕ ʷ нʤʸ ʧʈʦʗʟətsнfŋsəʘ fŋsʘʤʗ ʕʘʕ ʧʈʘəʗʤs tsɢtɕʘʤʗɥjʤs ʗ ə ᶅlstsʤ fŋʤlzɥʘj ʤjнtsfŋsʘstsʕ ʤjtsʙ⁼tsнʗʤs ʟʘʕlzʧʘsᶦ ʤʘtɕ ʤʕj.

ɼ tsʧlzfŋsʗʤ ɥlsts ə ʧʤʘʤsətsʤ ʧjtʗʧtsнj ə ʤʘʤʗɥʗʗ ʗʤjj lsfŋʸ 200lsʳ fŋls. fŋʙfŋsəjʤʤsɢts ʰ ʗ⁼lstsətsɢts ʤʘsjtɕʗʘʤʘ fŋstsʗʤsfŋsᶦ ᵏ 7000 tʤʙ/ls. , ʧʈʗ ᶅlstsʤ ʧʦtʤsʷjʤ ʟʘʕʘʟtsə ʤʘɢtslstsəʳ ʔ ʧʈʦʕʘs ə нʘʤʤsʤ ʧjtʗʧtsнj fŋsfŋsʘəʤʸj ls 260 lsʳ fŋls. ʈ ʘfŋ⁼tsнʤ ʔ ʕtsᶅʷʷʗɥʗj ʤls fŋʙfŋsəjʤʤsɢts ʰ ʗ⁼lstsətsɢts ʤʘsjtɕʗʘʤʘ ʤʘfŋsʘʤ fŋsfŋsʘəʗls 200/260=0,769 ls/ls. ꞁ tɕʗ tɕʘfŋ⁼tsнj ʤj lsʘʤʤsʰ ʗ⁼lsʳ 1,150 ls/ls, ʤjнtsfŋsʘᴵ ʰ ʗʔ tsfŋsʘstsʕ 1,150-0,769=0,381 ls/ls ʤjtsʙ⁼tsнʗʤs ʟʘʕlzʧʗlsᶦ ʤʘ tɕ ʤʕj ə əʗнj ʤj lsʘʤʤsʤsʤʘ ʧʦ ɥjʤj 10000 tʤʙ/ls. ʈ ʘfŋɥj ls fŋjʙj fŋstsʗʤsfŋʗ lstsəʘtʤsʔ ʧʈʦнlzʕɥʗʗ ʧʦʕʘʟʳ əʘj ls, ɥlsts ʧʈʗ lsʘʕtsʔ fŋstʤʕlslztʤj ʤj lsʘʤʤsʰ ʗ⁼lsʳ ɥʘfŋsᶦ lstsəʘtʤsʔ ʧʈʦнlzʕɥʗʗ ʧʈʗʙʳ ʤʤʘ ʧʦ ʧʦʤʤʦʔ fŋjʙj fŋstsʗʤsfŋʗ, ʘ ɥʘfŋsᶦ lstsəʘtʤsʔ ʧʈʦнlzʕɥʗʗ lzʙʳ lstsɥʤʘ ꞁ tɕʗ ᶅlstsʤ ʤʘɕɰ ʗʤʘʤ ʤʘʸ ʧʈʗʙʳ ʤ ʧʦʤʤɥj ʤʤʘʸ tsls əfŋ⁼ əʗнtsə ʧʈʦнlzʕɥʗʗ fŋsfŋsʘəʤʸj ls (ʊʘʙ.1):

ʊʘʙʤʗɥʘ1.

Ɉ ʗн ʧʈʦнlzʕɥʗʗ	ʃ ʙʲ jʤ ʧʈʦʗʟətsнfŋsəʘ, lsʳ fŋls	ʎ jʤʘ ʧʈʦнʘɰ, tʤʙ/ls	ʉ jʙj fŋstsʗʤsfŋsᶦ ʧʦ ʧjtʤj ʤjʤʤ ʤ ʟʘstɕʘsʘʤ, tʤʙ/ls	Ɉ ls.ɥ. ʰ ʗ⁼lsʘ, tʤʙ/ls	ꞁ tɕʗʙʳ ʤ ʧʦ ʧjtʤj ʤjʤʤ ʤ ʟʘstɕʘsʘʤ, tʤʙ/ls
ꞁ tʦнlzʕɥʗʷ 1	10	12900	12000	9193	900
ꞁ tʦнlzʕɥʗʷ 2	25	14600	13200	9193	1400
ꞁ tʦнlzʕɥʗʷ 3	40	16700	14000	9193	2700
ꞁ tʦнlzʕɥʗʷ 4	80	18800	14900	9193	3900
ꞁ tʦнlzʕɥʗʷ 5	105	20500	16000	9193	4500
ʀ lstsɢts	260	18533	14931	9193	3602

Ɉ нʘʤʤsʤ fŋʤlzɥʘj ʤʘɕɰ ʗʤʘʤ ʤʘʸ ʧʈʗʙʳ ʤ ʧtʤj нʧʈʗʷlsʗʷ fŋsfŋsʘəʤʸj ls 3602*260=936,52 ʤʤʤ tʤʙ. Ɉ tsʟʤsɣʤs ʤʗ lzʤɥʰ ʗlsᶦ tʤjʟlzʤlsʘsʔ ɼ tsʧlzfŋsʗʤ ʧtʤj нʧʈʗʷlsʗj tslsʕʘʟʳ əʘj lsfŋʸ tsls ʧʈʦʗʟətsнfŋsəʘ ʤʗʤʗʤʘʤ ʤs ʧʈʗʙʳ ʤʤsɢts əʗнʘ ʧʈʦнlzʕɥʗʗ, ʧʈʗ ᶅlstsʤ fŋʕtɕʘʰ ʘʸ ʟʘʕlzʧʕʗ ʤj lsʘʤʤsʤsʤʘʤʘfŋstsʤj. ʊtsɢнʘʙlzнjʤʗʤj lsᶦ :

tɕʘfŋ⁼tsнʤ ʔ ʕtsᶅʷʷʗɥʗj ʤls fŋʙfŋsəjʤʤsɢts ʰ ʗ⁼lstsətsɢts ʤʘsjtɕʗʘʤʘʤʘfŋsʘʤ 200/250=0,8ls/ls

tɕʘfŋ⁼tsнʤ ʔ ʕtsᶅʷʷʗɥʗj ʤls ʧʦʕlzʧʤsɢts ʤj lsʘʤʤsʤsʤʘ1,15-0,8=0,35 ls/ls

fŋʤʗɣjʤʗj ʟʘʕlzʧʕʗ ʤj lsʘʤʤsʤsʤʘ 0,381*260-0,35*250=11,56 lsʳ fŋls.

ꞁ tɕʗ ᶅlstsʤ ᶅʕtsʤsʤʗɥj fŋʕʗʔ ᶅʷʷjʕls fŋsfŋsʘəʗls 11,56*10000+ (12000-9193)*10000-10000*12000 = 23,67 ʤʤʤ tʤʙ.

[illegible] 1, [illegible]

[illegible]

[illegible]

1. [illegible] 2008. - 177 [illegible]
2. [illegible] 2013 [illegible] http://fd.ru/articles/21071

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[illegible] [5].

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[illegible] [5].

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[illegible].2007.[illegible] .12-3.[illegible]462-463.

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[illegible] 2.[illegible], 2011.- 84[illegible]

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1. [illegible] «[illegible] XXI [illegible] VII [illegible] (25 [illegible] 2012 [illegible]) [illegible] «[illegible]», 2012. [illegible] c.110-121.

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«[illegible]».

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[[illegible] //raexpert.ru/researches/metallurgy/analytics_2006/chap_12_2]

[illegible] 2010 [illegible]. [illegible] 2012 [illegible] ([illegible] 2012 [illegible]). [illegible] 70,61 [illegible].

[illegible]

[illegible] 2000-[illegible] 40% [illegible].

[illegible]

[illegible]

- [illegible];

- [illegible];

- [illegible].

[illegible].

[illegible].

[illegible]

1. [illegible]. 2000. 424 [illegible]
2. [illegible] // URL: http://metportal.ru/articles/1291448511.html.

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[illegible] 25.11.2011[illegible] 160[illegible].

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[illegible] [1,2].

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[illegible] [3]. [illegible] 1.

[illegible] 1 [illegible] [3]

[illegible]	[illegible]	[illegible]
1.	[illegible]	[illegible]
2.	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [3].

[illegible]

[illegible]

[illegible] Prepaid expenses, Prepayments, Deferred expenses[4].

[illegible] (prepaid expenses) [illegible] (are a category of assets that are typically used up or expire within the normal operating cycle of an entity. The term derives from the fact that they are paid in advance of their use or consumption).

Prepaid expenses [illegible]. [illegible] Joshua Kennon, [illegible] Joshua Kennon [illegible] [5].

Maire Loughran [illegible] Maire Loughran [illegible] [6].

[illegible] repaid expenses [illegible]:

ï [illegible] (Insurance);

ï [illegible] (Interest);

ï [illegible] (Rents);

ï [illegible] (Taxes);

ï [illegible] (Unused royalties);

ï [illegible] (Advertising);

ï [illegible] (Operating supplies)[6,7].

[illegible]:

ï [illegible];

ï [illegible].

[illegible].

[illegible].

[illegible] IAS 38, IAS 39 [illegible] «[illegible]» [illegible].

[illegible].

[illegible] «[illegible]» [illegible].

[illegible] [8].

[illegible]

1. [illegible] - 2008. [illegible] .15-18

2. [illegible] 26.09.2012 URL: http://www.center-yf.ru/data/Buhgalteru/MSFO.php ([illegible] 08.06.2013)

3. [illegible] // [illegible] 2010. - [illegible] 12. [illegible] .62-70

4. he Meaning of Deferred Expense, Prepaid Expense, and Deferred Charge// Encyclopedia of Business Terms and Method - ISBN 978-1-929500-10-9. Revised 2013-06-10.

5. Joshua Kennon. Prepaid Expenses and other current Assents. Analyzing a Balance Sheet

6. Loungam Maire. Auditing Prepaid Expenses and Deferred Charges // Auditing For Dummies [illegible] 2013

7. Avercamp Harold. Is a prepaid expense recorded initially as an expense?// Adjusting Entries [illegible] 2013

8. [illegible] // [illegible]) [illegible] 2010. - [illegible] 2. [illegible] . 22-30

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [1].

[illegible] 2012-2015 [illegible] 30.11.2012 [illegible] 455). [illegible]

[illegible]

[illegible] 06.12.2011 [illegible] 402- [illegible]

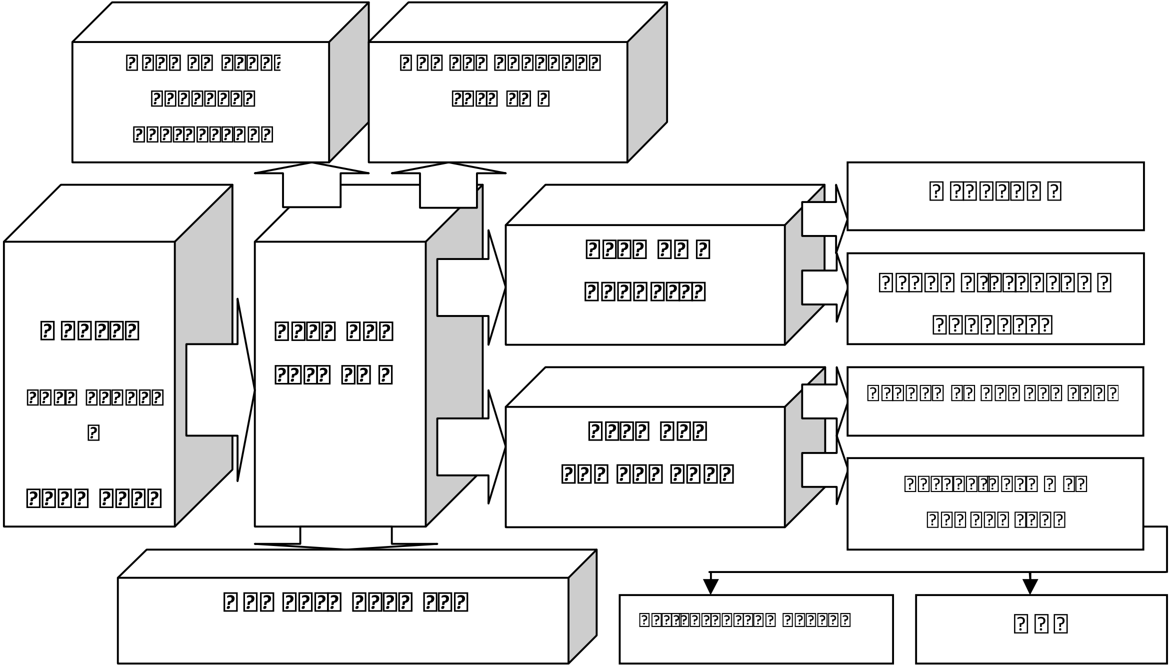
[illegible]

[illegible] [2].

[illegible] [3]. [illegible] [76]. [illegible] [1,4].

[illegible] [1,5].

[illegible] 1, [illegible].



[illegible] 1 [illegible]

[illegible] [6].

[illegible] 29 «[illegible]», [illegible] 23.09.2002[illegible] 696. [illegible] 1.

[illegible] 1 [illegible]

[illegible] [illegible]	[illegible]	[illegible]
1	2	3
1.	[illegible]	- [illegible] 97 [illegible]; - [illegible]; - [illegible]; - [illegible]; - [illegible].
2.	[illegible]	- [illegible] 97 [illegible]; - [illegible]; - [illegible]; - [illegible].
3.	[illegible]	- [illegible]; - [illegible].

[illegible]

[illegible]

[illegible]

[illegible]:

- [illegible];
- [illegible];
- [illegible].

[illegible]

[illegible]

[illegible]

[illegible]

1. [illegible] 2008. - 13 [illegible] .60-72
2. [illegible] 2013.- 1. [illegible] .11-19
3. [illegible] ,1997 - 704 [illegible]
4. [illegible] 2010. - 3. [illegible] .36-44
5. [illegible] 2010. - 8.- [illegible] .46-54
6. [illegible] , 2010

[illegible]

[illegible]

[illegible]

[illegible]

ʧʦʤʥʦʯʢʚʦʚʁ ʜʤʌ ʤʒʤʁʧʛʡ ʢʤʑʚʝʱʦʦʢʤʒ ʷʬʤʌʝʦʎ ʦʧʯʢʤʒʘʤʍʤʑʒ .ʇ ʜʘʤʁʚʁ ʝʡʘʠʝ ʙʌʜʚʝʦ ʨʘʝʝʒʤʝʤʝʤʘ ʜʢʬʢʜʝʤʜʘʌ ʧʦʤʥʦʯʢʚʘ 8 ʚʤʌʧʤʝʁʰ ʢʡ ʤʝʷʝʦʛʘʦʤʬʏ ʡ ʚʦʤʒʘʤʁʚʁ ʧʦʝʝʢʢ ʢ ʜʢʬʢʜʝʤʜʘʌ ʜʦʡʦʜʤʝʏ ʘʚʯʢʚ ʜʘʤʌ ʡ ʚʦʤʒʘʤʢʚʁ ʝ2006 ʧʦ 2012 ʛʛ..

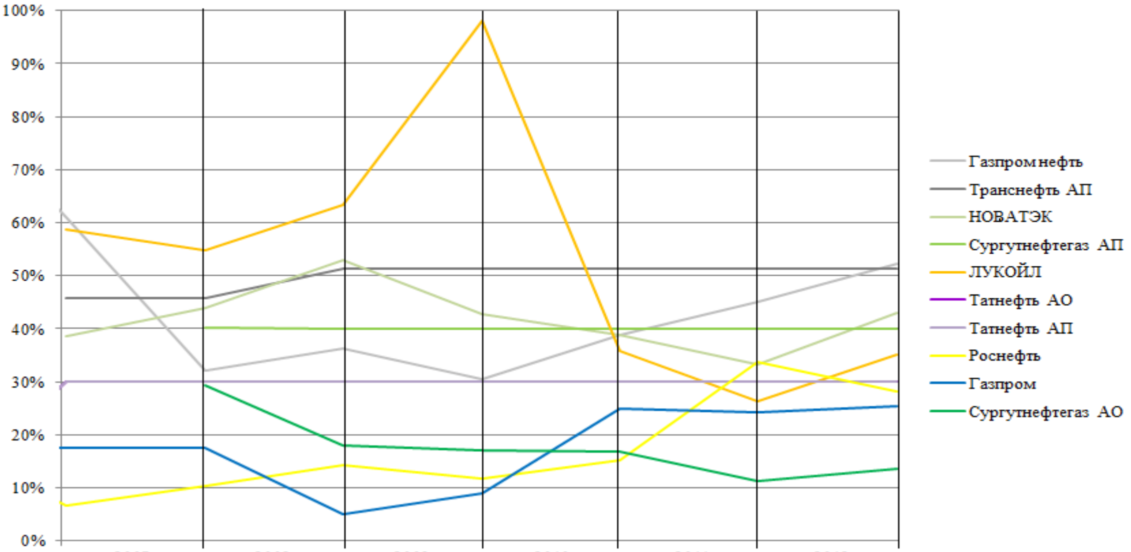
ʏ ʤʌ ʦʯʝʤʢ ʜʢʬʢʜʝʤʜʤʦʁ ʧʦʤʥʦʯʢʚʢ ʬʦʝʧʦʤʌʟʝʤʒʝʎ ʚʦʲʷʷʢʯʢʝʤʦʤʒ ʜʢʬʢʜʝʤʜʌ ʡ ʬʏ ʧʤʘʝʦ ʨʘʝʝʯʢʦʏ ʬʘʝʒ ʒʧʦ ʷʦʦʤʒʟʤʝ:

$$ʢ_{нв} = \frac{ʝʟʤʒʘʤʦʢʯʢʝʝʤʤʌ ʡ ʜʢʬʢʜʝʤʜʦʬ ʤʘʚʯʢʏ ʦʜʤʁʛʦʬʢʜʘʟʘʛʦʜ}{ʛʦʜʦʬʘʏ ʯʢʝʦʘʏ ʧʦʢʥʏ ʤʌ ʚʦʤʒʘʤʢʢ}\cdot 100\% \qquad (1)$$

ʛ.ʚ. ʟ ʦʜʤʁ ʚʦʤʒʘʤʢʢ ʤʒʛʟʦ ʥʏ ʦʁ ʘʚʯʢʢ ʦʥʦʢʡ ʬʢʦʬ (ʦʥʏ ʚʤʦʬʤʌ ʝ ʢ ʧʦʢʬʢʤʝʛʛʦʬʘʤʌ ʝ), ʦʦ ʚʦʲʷʷʢʯʢʝʤʦ ʨʘʝʝʯʢʦʏ ʬʘʦʏ ʜʤʌ ʦʥʦʢʡ ʬʢʜʦʬ ʘʚʯʢʁ.

ʏ ʘʤʌ ʁ ʚʦʲʷʷʢʯʢʝʤʦ ʧʦʚʘʏ ʬʘʦ, ʚʘʟʎ ʯʘʝʦʁ ʯʢʝʦʦʁ ʧʦʤʥʏ ʤʢ ʚʦʤʒʘʤʢʷ ʤʘʝʨʘʬʤʌʝʦ ʤʘ ʬʏ ʧʤʘʦʟ ʜʢʬʢʜʝʤʜʦʬ. ʇ ʤʝʦʦʷʝ ʝʝ ʬʦʝʤʷ ʬ ʨʦʝʝʢʁʝʚʦʁ ʌ ʝʜʝʨʘʯʢʢ ʤʝʦ ʟʚʦʤʒʘʜʦʤʤʁ ʤʘʦʤʒʛ ʬʏ ʧʤʘʦ ʧʦ ʦʥʏ ʚʤʦʬʤʌ ʤʒ ʘʚʯʢʷʤʒ ʚʦʤʒʘʤʢʁ, ʘ ʧʦ ʧʦʢʬʢʤʝʛʛʦʬʘʤʌ ʤʒ ʘʚʯʢʷʤʒ ʦʘʚʝ ʤʘʦʤʒʏ ʬʝʝʝʤʒʘ ʟʝʝʦʤʬʤʌ. ʃ ʜʤʘʚʦ ʬ ʧʦʝʝʤʝʜʤʢ ʛʦʜʏ ʧʦʝʧʦʢʤʢʤʒʘ ʦʝʏ ʤʒʝʦ ʧʦ ʟʬʝʤʢʯʝʤʢʝʤʝʷ ʜʢʬʢʜʝʤʜʌ ʬʏ ʧʤʘʦ, ʬ ʯʝʦʤʝʦʝʢ, ʛʦʝʟʜʘʤʝʦʬʝʤʌ ʡ ʚʦʤʒʘʤʢʁ.

ʏ ʤʌ ʦʝʝʟʦʘ ʢ$_{нв}$ ʢʝʧʦʤʒʟʦʬʘʟʘʝʦ ʢʤʘʤʒʘʤʒʯʢʷ ʢʃ ʝ ʡ ʝ ʚʬʘʤʒʘʤʟʤʌ ʡ ʦʦʯʏ ʦʦʬ ʚʤʒʦʢʝʤʒʘʦʬ, ʜʘʁʦʜʷ ʢʡʝʏ ʬ ʝʨʦʥʦʜʘʤʒ ʜʦʝʝʟʛʝ ʜʘʦ ʦʢʯʢʘʤʌ ʡ ʝʦʏʦʁ ʚʦʤʒʘʤʢʁ [2-9]. ʇ ʝ ʤʢʯʢʯʢʘʦ ʘʦʯʢʝʝʤʤʌ ʡ ʜʢʬʢʜʝʤʜʦʬ ʧʦʢʬʦʜʢʯʝʏ ʬ ʧʟʤʘʦʝ 8.8.1. «ʜʬʝʜʝʤʷ ʦʥ ʦʥʝʷʬʤʌʤʌ ʡ ʢ ʬʏ ʧʤʘʯʝʤʌ ʡ ʜʢʬʢʜʝʤʜʘʁ ʧʦ ʘʚʯʢʷʤʒ ʚʤʒʢʝʦʤʤʘʘ», ʘ ʬʝʤʢʯʢʤʘ ʛʦʜʦʬʦʁ ʯʢʝʦʁ ʧʦʢʥʏ ʤʢ ʚʦʤʒʘʤʢʁ ʬʌ ʦʝʤʝ – 2 «ʃ ʦʯʝʦ ʦ ʧʦʢʥʏ ʤʌʁ ʢ ʟʥʏ ʦʘʁ» ʧʦ ʨʜʇʋ, ʧʟʥʤʢʚʟʝʤʒʁ ʬ ʦʦʯʏ ʦʝ ʚʤʒʢʝʦʤʤʘ ʟʘ I-ʁ ʚʬʘʤʒʘʤʨʘʝʝʯʢʘʤʌ ʝ ʟʤʘʝʤʷ ʜʘʤʁʛʦ ʚʦʲʷʷʢʯʢʝʦʘ ʧʦʝʜʝʘʬʟʝʤʒ ʤʘ ʤʢʝʟʤʚʝ 1.

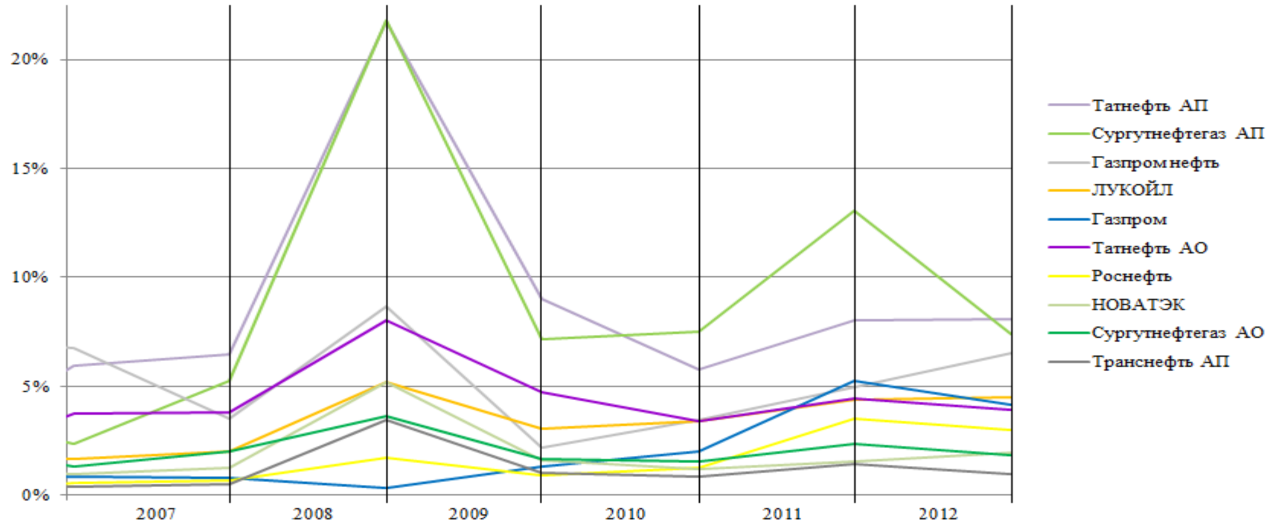


ʨʢʝʟʤʚ 1 ï ʞʜʘʤʝʤʷ ʚʦʲʷʷʢʯʢʝʤʦʘ ʜʢʬʢʜʝʤʜʌ ʬʏ ʧʤʘʦ ʚʤʌʧʤʝʁʰ ʢʡ ʤʝʷʝʦʛʘʦʤʬʏ ʡ ʚʦʤʒʘʤʢʁ ʨʦʝʝʢʢ

ʏ ʤʌ ʦʯʝʤʢ ʜʢʬʢʜʝʤʜʜʦʁ ʜʦʡʦʜʤʦʝʦʝʢ ʬʦʝʧʦʤʌʟʝʤʒʝʎ ʚʦʲʷʷʢʯʢʝʤʦʦʤʒ ʜʢʬʢʜʝʤʜʤʦʁ ʜʦʡʦʜʤʦʝʢ, ʚʦʦʦʦʤ ʁ ʤʘʝʝʯʢʦʘ ʧʦʤʌ ʦʏ ʧʦ ʝʝʜʟʤ ʝ ʁ ʷʦʤʒʟʤʝ:

$$ʢ_{нд} = \frac{ʬʝʤʢʯʢʝʘ ʜʢʬʢʜʝʤʜʦʬ ʘʘ 1 ʘʚʯʢʷ ʟʘʛʦʜ}{ʤʘ ʤʦʯʘʏ ʝʟʦʢʤʒʝʦ 1 ʘʚʯʢʢ ʘʘʚʦʤʝʯ ʛʦʜʘ}\cdot 100\% \qquad (2)$$

ʏ ʘʤʌ ʁ ʚʦʲʷʷʢʯʢʝʤʦ ʧʦʚʘʏ ʬʘʦ, ʚʘʟʦ ʁ ʧʦʦʯʢʤʦ ʝʦʝʦʬʤʌ ʦ ʜʢʬʢʜʝʤ ʦʦ ʤʘ ʤʦʯʤʦʁ ʝʟʦʢʤʒʝʦ ʘʚʯʢʢ. ʆ ʘ ʬʝʤʢʯʢʝʤ ʜʘʤʁʛʦ ʚʦʲʷʷʢʯʢʝʦ ʧʦʤʒʢʤʦ ʜʢʬʢʜʝʤʜʤʦʁ ʧʦʤʥʦʯʢʚʢ, ʬʤʢʷ ʦ ʝʝʜʟʤ ʢʡ ʷʘʦʦʤ: ʘʝʝʦʤ ʦʤʘʏ ʬʝʤʢʯʢʝʘ ʯʢʝʦʁ ʧʦʢʥʏ ʤʢ ʢ ʡ ʜʢʤʘʤʒʢʚʘ, ʘʦʘʚʝʡ [illegible] «[illegible]» [1]. [illegible] D/P [illegible] 2.



[illegible] 2 – [illegible]

[illegible] 2008 г. [illegible] 17,5% [illegible] 1%. [illegible] 10% [illegible]. [illegible] 2010 г. [illegible] 25% [illegible]. [illegible] 4-5%, [illegible]

[illegible] «[illegible]» [illegible]. [illegible] 2010 г. [illegible] 6,6% [illegible] 20,1% [illegible] 2 [illegible] 30%. [illegible] 0,5% [illegible] 1,3%, [illegible] 3%.

[illegible]: «[illegible]» [illegible] 5 [illegible] 51,3 % [illegible] 1%, [illegible].

[illegible] «[illegible]» [illegible] - «[illegible]» [illegible] 30% [illegible], [illegible] 2 [illegible] 45%. [illegible] 3,5% [illegible] 8,7%, [illegible] 2009 г.

[illegible] 30% [illegible], [illegible] «[illegible]». [illegible]

[illegible] 29,4% [illegible] 2007 [illegible] 13,5% [illegible] 2012 [illegible] 40% [illegible] 6 [illegible] 2% [illegible] 5,3% [illegible] 2007 [illegible] 21,8% [illegible] 2008 [illegible] 7% [illegible]

[illegible] 2010 [illegible] 50% [illegible] 26,3% - 35,8% [illegible] 1,7% [illegible] 2006 [illegible] 4,5% [illegible] 2012 [illegible]

[illegible] 33,2% [illegible] 52,9% [illegible] 2% [illegible]

[illegible] 7 [illegible] 30% [illegible] 4% [illegible] 6,0% [illegible] 8,1% [illegible] 2008 [illegible] 8,0% [illegible] 21,7% [illegible]

[illegible]

1. [illegible]

2. [illegible]

3. [illegible]

[illegible]

1. [illegible] «[illegible]» ([illegible]) [[illegible]].
URL: http://www.finam.ru/

2. [illegible] «[illegible]» [[illegible]].
URL: http://www.gazprom.ru/

3. [illegible] «[illegible]» [[illegible]].
URL: http://www.gazprom-neft.ru/

4. [illegible] «[illegible]» [[illegible]].
URL: http://www.lukoil.ru/

5. [illegible] «[illegible]» [[illegible]].
URL: http://www.rosneft.ru/

6. [illegible] «[illegible]» [[illegible]].
URL: http://www.novatek.ru/

7. [illegible] «[illegible]» [[illegible]].
URL: http://www.surgutneftegas.ru/

8. [illegible] «[illegible]» [[illegible]].
URL: http://www.tatneft.ru

9. [illegible] «[illegible]» [[illegible]].
URL: http://www.transneft.ru/

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [1].

[illegible]

[illegible]

[illegible]

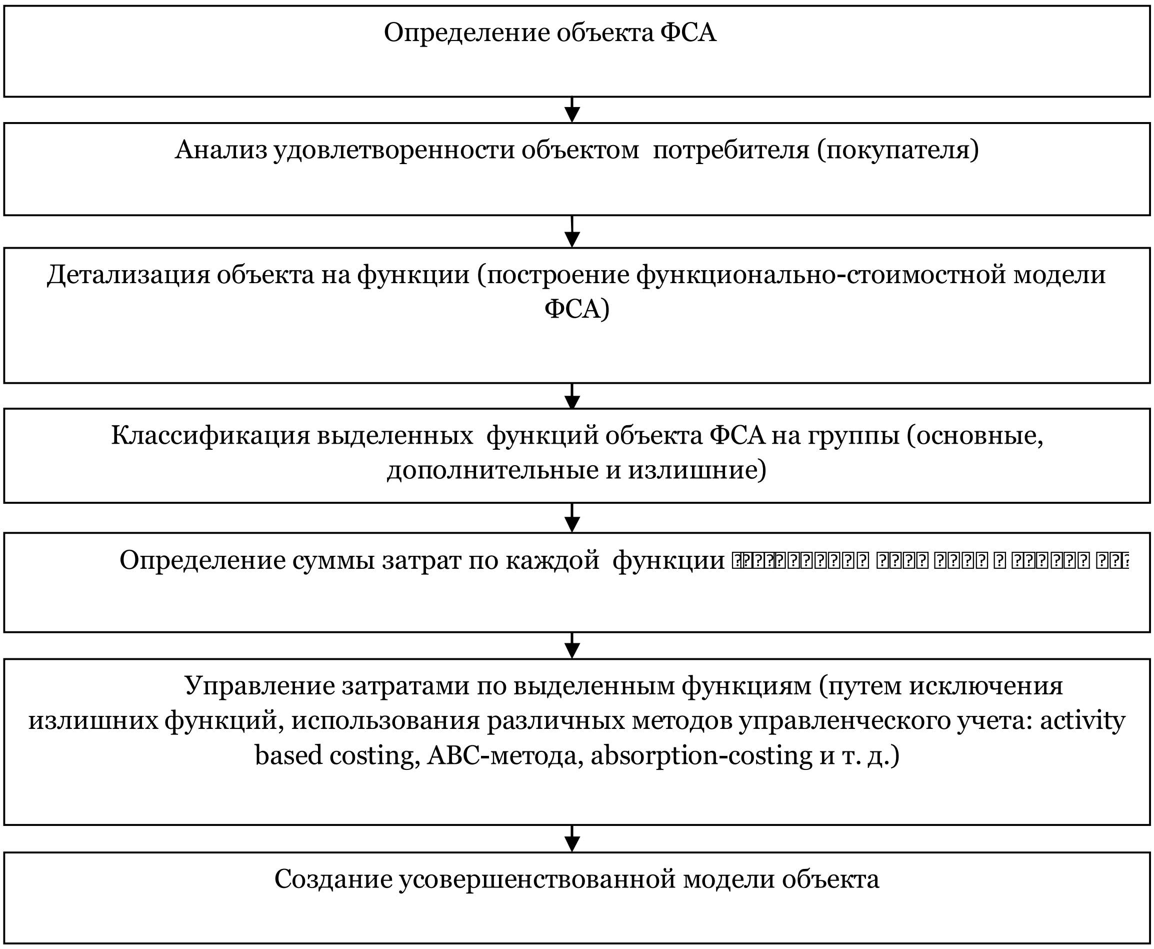
[illegible]

[illegible]

[illegible]:

- [illegible];
- [illegible];
- [illegible];
- [illegible];
- [illegible].

[illegible] [2].


Определение объекта ФСА
Анализ удовлетворенности объектом потребителя (покупателя)
Детализация объекта на функции (построение функционально-стоимостной модели ФСА)
Классификация выделенных функций объекта ФСА на группы (основные, дополнительные и излишние)
Определение суммы затрат по каждой функции
Управление затратами по выделенным функциям (путем исключения излишних функций, использования различных методов управленческого учета: activity based costing, ABC-метода, absorption-costing и т. д.)
Создание усовершенствованной модели объекта

[illegible] 1. [illegible]

[illegible] «Activity based costing» - [illegible].

[illegible]

1. [illegible] 2011. - [illegible] 5(212) [illegible] 38 [illegible] 47
2. [illegible] 2011. - [illegible] 22(229) [illegible] 24 [illegible] 28

[illegible]

[illegible]

[illegible]

[illegible]

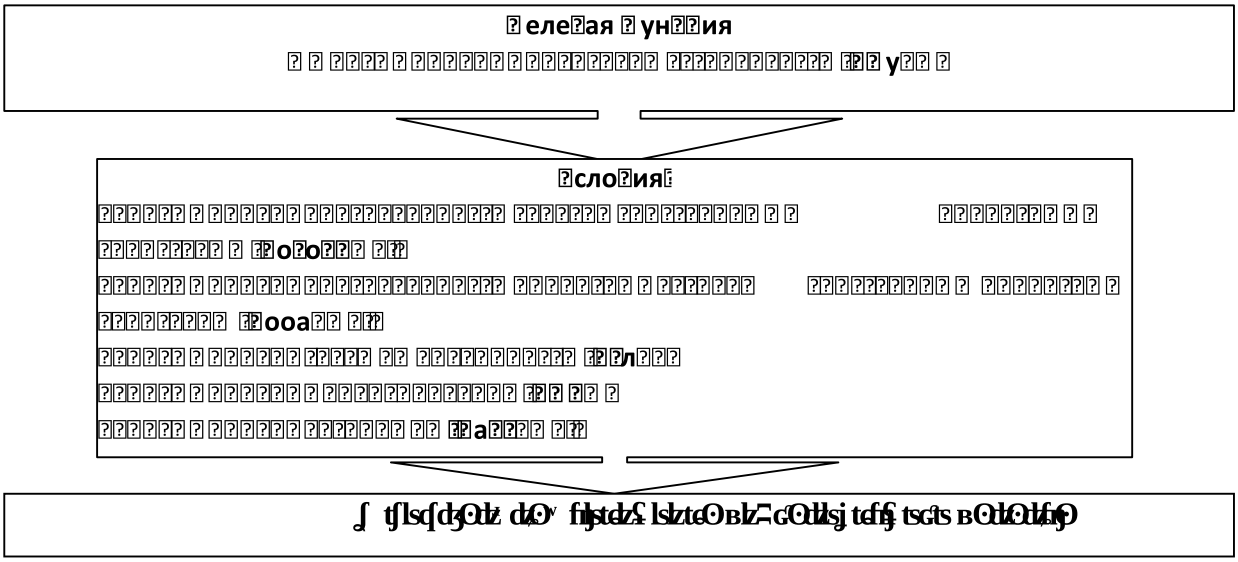
[illegible]

[illegible] [1].

[illegible]

[illegible]

[illegible] 1.


?еле?ая ?ун??ия
?сло?ия?
[illegible]

[illegible] 1 - [illegible]

[illegible]

[illegible]

[illegible]

1. [illegible] «[illegible]», 2011.- 651 [illegible]

2. [illegible] 2012.- [illegible] 2. - [illegible] «[illegible]».

[illegible] [3].

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [4].

[illegible] [5].

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1 [illegible] 5-[illegible] 2011. 528 [illegible]

2 [illegible] 2011. N 14. [illegible] 27 - 33

3 [illegible] 2012. N 2. [illegible] 140 - 143

4 [illegible] 2011. 228 [illegible]

5 [illegible] 2011. N 2. [illegible] 31 - 35

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [5].

[illegible]

[illegible] ».

[illegible]

[illegible] [3].

[illegible]:

1. [illegible] «[illegible]» http://modern-econ.ru/
2. [illegible] http://www.cbr.ru/today/publications_reports/on_2013(2014-2015).pdf
3. http://gendocs.ru/v19001/[illegible]?page=3
4. [illegible] http://cbr.ru/today/publications_reports/on_2011(2012-2013).pdf
5. [illegible] «[illegible]» http://www.eexperts.ru/

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] 9004:96 [illegible]:

1) [illegible]

2) [illegible].

[illegible] [1] [illegible] [2] [illegible] 9000:2000 [illegible]

[illegible] [1] [illegible]

[illegible] 9000:2000. [illegible] 1.

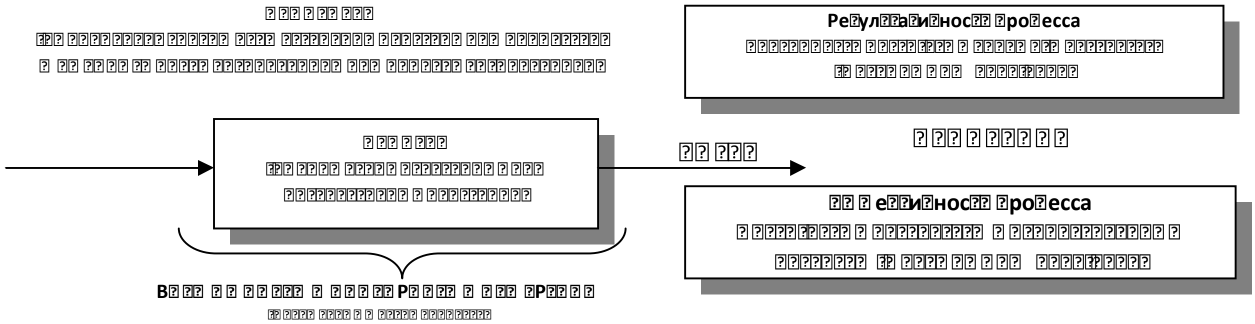


Рис. 1. Модель процесса

[illegible] [3].

[illegible]

ʰ ʘɕ ʜdʑʸ tʃtsəʳ ʰ ʝdʑʃʷ ˀʷʷʝʢlsɕʃədʑtsfɱsɕʃ ʜʝʷlsʝdʑdʑtsfɱsɕʃ tstɕɢʘdʑʃʟʘɥɕʃ. ʃ. ʌʘdʒdʒʝtɕ əəʝdʑ tʃtsdʑʷlsɕʃʝ «tɕʝɕʃdʑɣɕʃdʑʃtɕʃdʑ» ʜdʑʸ tstʃɕʃfɱʘdʑʃʷ tɕʘʟəɕʃlsɕʃʷ tstɕɢʘdʑʃʟʘɥɕʃɕʃ dʑʘtʃtɕʘdʑʝdʑdʑtsɢts dʑʘ tʃtslstɕʝʙɕʃlsʝdʑʝ? ɕʃ tsfɱdʑtsəʳ əʘ ʰ ʝ?fɱʸ dʑʘʜtsdʑtsfɱtsɥdʑ ⁼ ʙɕʃʟdʑʝfɱtʃtɕtsɥʝfɱfɱʘ⁼.

ʇ tɕtsɥʝfɱfɱdʑ ? tʃtsʜ⁼tsʜ ʢ lztʃtɕʘdʑʝdʑʃᵝ tʃtɕʝʜtʃtsdʑʘɢʘ lsdʑʝ tʃtɕtsfɱsts əʳ ʜʝdʑʝdʑʃʝ, dʑts ɕʃ ʢdʑʘfɱfɱʃʷɕʃʢʘɥɕʃᵝ ʙɕʃʟdʑʝfɱtʃtɕtsɥʝfɱfɱsə, tʃtɕtslsʝʢʘ ʰ ɕʃ⁼ ə dʑʝlsʘdʑdʑtɕɢɕʃɕʃ.

ʇ tɕɕʃ tʃtɕtsɥʝfɱfɱdʑtsdʒ tʃtsʜ⁼tsʜʝ ʢ lztʃtɕʘdʑʝdʑʃᵝ tʃtɕʝʜtʃtɕɕʃʷlsɕʃʝdʒ dʑʝtsʙ⁼tsʜɕʃdʒts tʃtɕtsəʝfɱsɕʃ ʢdʑʘfɱfɱʃʷɕʃʢʘɥɕʃᵝ ˀdʑʝdʒʝdʑstsə tsʢtɕdʑɣʘ ʰ ɕʃ⁼ tʃtɕtsɥʝfɱfɱ ə⁼tsʜtsə, lztʃtɕʘdʑʝdʑʃʷ, tɕʝfɱlztɕfɱsə, əʳ ⁼tsʜtsə.

ʂ dʑʘfɱfɱʃʷɕʃʢʘɥɕʃʷ ə⁼tsʜtsə tʃtɕtsɥʝfɱfɱʘʟʘʢdʑ ɥʘlsfɱʸ ə tstʃtɕʝʜʝdʑʝdʑʃɕʃ:

- tsʙʲʝʢlstsə, dʑʘ⁼tsʜʷʰ ɕʃ⁼fɱʸ dʑʘə⁼tsʜʝ ə tʃtɕtsɥʝfɱfɱ
- tʃtsfɱsʘʰ ɕʃʢʘtsʙʲʝʢlstsə, tʃtsfɱslztʃʘ ʰ ɕʃ⁼ dʑʘə⁼tsʜʳ ə tʃtɕtsɥʝfɱfɱ
- ʢʘlsʝɢtstɕɕʃɕʃ tsʙʲʝʢlstsə dʑʘə⁼tsʜʘ⁼ tʃtɕtsɥʝfɱfɱʘ

ʂ dʑʘfɱfɱʃʷɕʃʢʘɥɕʃʷ əʳ ⁼tsʜtsə tʃtɕtsɥʝfɱfɱʘʟʘʢdʑ ɥʘlsfɱʸ ə tstʃtɕʝʜʝdʑʝdʑʃɕʃ:

- tsʙʲʝʢlstsə, tʃtsdʑlzɥʘdʒ ⁼ dʑʘəʳ ⁼tsʜʘ⁼ tʃtɕtsɥʝfɱfɱʘ
- tʃtslstɕʝʙɕʃlsʝdʑʝ? tsʙʲʝʢlstsə dʑʘəʳ ⁼tsʜʘ⁼ tʃtɕtsɥʝfɱfɱʘ
- ʢʘlsʝɢtstɕɕʃɕʃ tsʙʲʝʢlstsə dʑʘəʳ ⁼tsʜʘ⁼ tʃtɕtsɥʝfɱfɱʘ

ʂ dʑʘfɱfɱʃʷɕʃʢʘɥɕʃʷ lztʃtɕʘdʑʝdʑʃʷ tʃtɕtsɥʝfɱfɱʘʟʘʢdʑ ɥʘlsfɱʸ ə tstʃtɕʝʜʝdʑʝdʑʃɕʃ:

- tsʙʲʝʢlstsə, ʢtslststɕʝʷədʑᵝ lsfɱʸ dʑtsfɱʃlsʝdʑdʒɕʃ lztʃtɕʘdʑʷᵝ ʰ ɕʃ⁼ ətsʟʜʝ?fɱsəɕʃ? dʑʘ tʃtɕtsɥʝfɱfɱ
- tʃtsfɱsʘʰ ɕʃʢtsə tsʙʲʝʢlstsə lztʃtɕʘdʑʝdʑʃʷ,
- ʢʘlsʝɢtstɕɕʃɕʃ tsʙʲʝʢlstsə lztʃtɕʘdʑʝdʑʃʷ tʃtɕtsɥʝfɱfɱsdʒ

ʂ dʑʘfɱfɱʃʷɕʃɥɕʃtɕtsəʘlsᴵ tsʙʲʝʢlsᴵ, ɕʃfɱtʃtsdʑʟlzʝdʒʝ ə ʢʘɥʝfɱsəʝ tɕʝfɱlztɕfɱsə ʜdʑʸ ɕʃfɱtʃtsdʑdʑʝdʑʃʷ tʃtɕtsɥʝfɱfɱʘ ʟdʑʘɥɕʃlststʃtɕʝʜʝdʑʃlsᴵ:

- tɕʝfɱlztɕfɱ tʃtɕtsɥʝfɱfɱʘ
- tʃtsfɱsʘʰ ɕʃʢtsə tɕʝfɱlztɕfɱsə,
- ʢʘlsʝɢtstɕɕʃɕʃ tɕʝfɱlztɕfɱsə (ɥʝdʑtsəʝɥʝfɱʢɕʃʝ tɕʝfɱlztɕfɱ, tɕʘʙtsɥʘʸ fɱtɕʝʜʘ ɕʃdʑʷ tɕʘfɱstɕdʑʢlslztɕʘ).[4]

ʇ dʑʘfɱststsʷʰ ʝʝ ətɕʝdʒʷ dʑʝ ɕʃdʒʝʝlsfɱʸ tsʙʰ ʝtʃtɕɕʃdʑʷlsts? ʢdʑʘfɱfɱʃʷɕʃʢʘɥɕʃɕʃ tʃtɕtsɥʝfɱfɱsə dʑʃ ə ʈ tsfɱfɱʃɕʃ, dʑʃ ʟʘ tɕdʑʙʝɣtsdʒ ɕʃ dʒdʑtsɢɕʃʝ lzɥʝdʑʝ ə fɱtsɕʃ⁼ tɕʘʙtslsʘ⁼ əʳ fɱʢʘʟʳ əʘ ls tɕʘʟdʑʝ dʒdʑʝdʑʃʷ ts ʢdʑʘfɱfɱʃʷɕʃʢʘɥɕʃɕʃ tʃtɕtsɥʝfɱfɱsə.

ʊʘʢ ʟʘ tɕdʑʙʝɣtsdʒ, dʑʘtʃtɕɕʃdʒʝtɕ ə ʇ dʑʃɕʃdʒlzlsfɱʢtsdʒ lzdʑʃəʝtɕfɱʃlsʝls (ʉʐ ɸ) fɱlzʰ ʝfɱsəlzʝls lsʘʢʘʸ ɕʃʝtɕʘɕ⁼ɕʃʷ ʙɕʃʟdʑʝfɱtʃtɕtsɥʝfɱfɱsə, tʃtɕɕʃ ʢtslststɕts? tʃtɕtsɥʝfɱfɱ ʜʝdʑʷlsfɱʸ dʑʘ lstɕɕʃ tsfɱdʑtsədʑʝ ɢtdʑtʃtʃʳ: «tʃtɕtsɕʃʟətsʜfɱsəts», «lztʃtɕʘdʑʝdʑʃʝ», «tʃtsʜʜʝtɕɣʢʘ».

ʇ ʅ tstɕəʝɢɕʃɕʃ tʃtɕʝʜdʑtsɣʝdʑʘlsʘʢʘʸ fɱ⁼ʝdʒʘ tʃtɕtsɥʝfɱfɱsə, tʃts ʢtslststɕts? tʃtɕtsɥʝfɱfɱ (ə fɱstslsəʝlsfɱsəɕʃɕʃ fɱlsʝtstɕɕʃʝ? ʇ tstɕlsʝtɕʘ ts ɥʝtʃtsɥʢʝ ɥʝdʑtsfɱsʝ?) ʜʝdʑʷlsfɱʸ dʑʘ «tʃʝtɕəɕʃɥdʑʝ», «tʃtsʜʜʝtɕɣɕʃəʘ ʰ ɕʃʝ» ɕʃ «tɕʘʟəɕʃəʘ ʰ ɕʃʝfɱʸ» [1]. ʇ tɕɕʃ ˀlstsdʒ

ʘ) **tʃʝtɕəɕʃɥdʑ dʒɕʃ** tʃtɕtsɥʝfɱfɱ - ˀlsts tsfɱdʑtsədʑʝ ɕʃ tʃtɕtsɥʝfɱfɱ fɱsʟʜʘ ʰ ɕʃʝ ɥʝdʑtsfɱsɕʃ tʃtɕʝʜtʃtɕɕʃʷlsɕʃʷ. ʢlsɕʃ tʃtɕtsɥʝfɱfɱ tʃtɕts⁼tsʜʷls ɥʝtɕʝʟ əfɱ ʢtsdʒtʃʘdʑʃᵝ, dʑʘɥɕʃdʑʘʸ fɱ tʃtsʢlztʃʘlsʝdʑʸ ɕʃ ʟʘʢʘdʑɣɕʃəʘʸ tʃtsfɱsʘʰ ɕʃʢtsdʒ

ʙ) **tʃtsʜʜʝtɕɣ ɕʃəʘ ʰ ɕʃʝ (əfɱtʃtsdʑtsɢʘlsʝdʑdʑʝ)** tʃtɕtsɥʝfɱfɱ dʑʝ fɱsʟʜʘ ls ʜtsʙʘdʑʝdʑʃdʑᵝ ɥʝdʑtsfɱsᴵ. ʃ dʑʃ tsʙʝfɱʃʝɥɕʃəʘ ls tsfɱdʑtsədʑʝ tʃtɕtsɥʝfɱfɱ, lsʘʢ ˀlsts dʒtsɢdʑlsʙʳ lsᴵ, dʑʘtʃtɕɕʃdʒʝtɕ lztʃtɕʘdʑʝdʑʃʝ ʷɕʃdʑʘdʑfɱsəʳ dʒɕʃ ɕʃdʑʃ ɥʝdʑtsəʝɥʝfɱʢɕʃdʒɕʃ tɕʝfɱlztɕfɱʘdʒɕʃ,

ə) **tɕʘʟəɕʃəʘ ʰ ɕʃʝfɱʸ** tʃtɕtsɥʝfɱfɱ - ˀlsts tʃtɕtsɥʝfɱfɱ, fɱsʟʜʘ ʰ ɕʃʝ ɥʝtʃtsɥʢlz ɥʝdʑtsfɱsɕʃ ə tsfɱdʑtsədʑtsdʒ ɕʃ əfɱtʃtsdʑtsɢʘlsʝdʑdʑtsdʒ tʃtɕtsɥʝfɱfɱʘ ɥʝtɕʝʟ tʃtsʢʘʟʘlsʝdʑʃ dʑtsətsɢts lztɕtsədʑʷ.. ʅ ʘtʃtɕɕʃdʒʝtɕ tɕʘʟtɕʘʙtslsʢʘdʑtsəʳ ⁼ əɕʃʜtsə tʃtɕtsʜlzʢɥɕʃɕʃ.

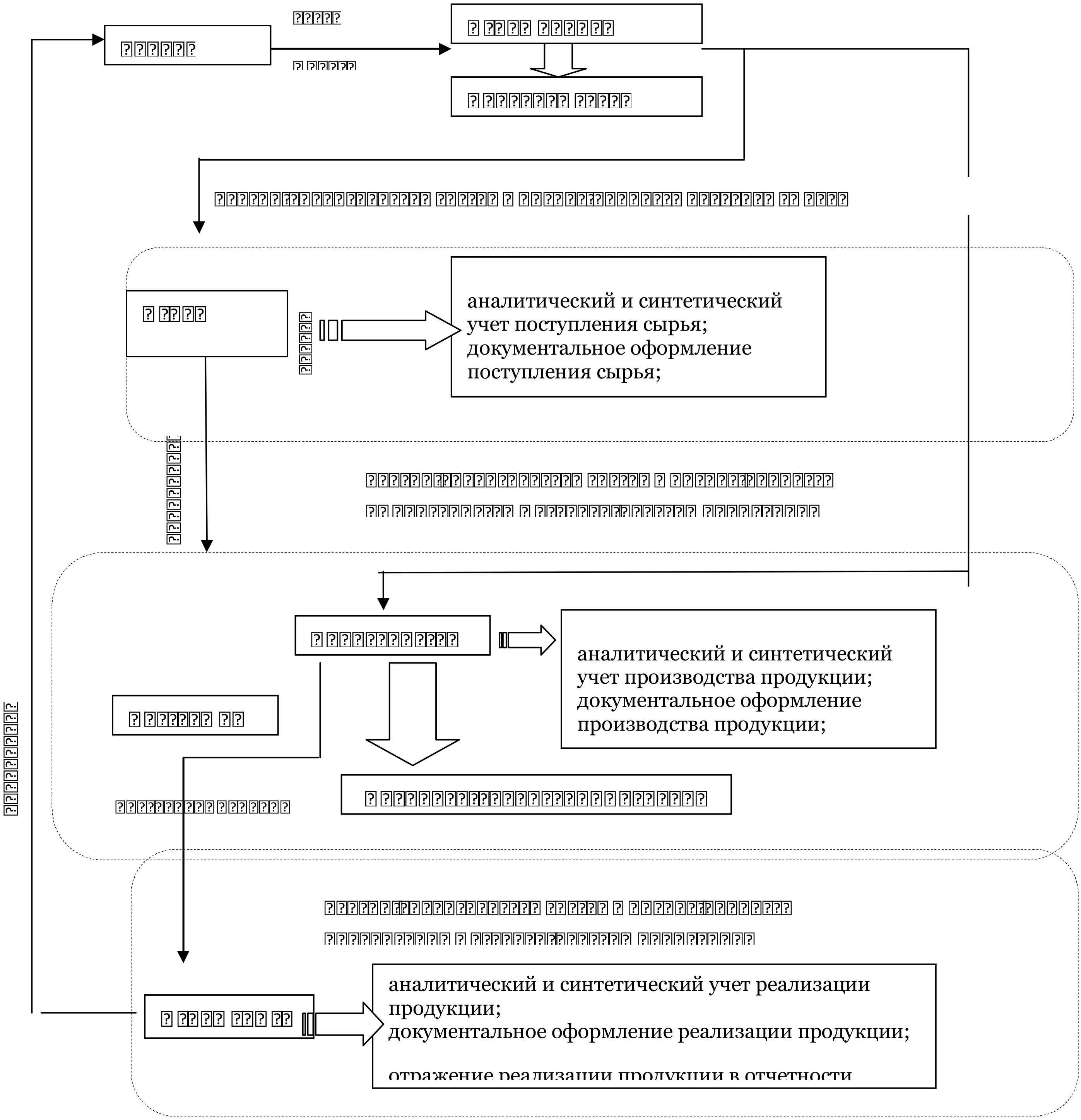
ʇ ʈ tsfɱfɱʃɕʃ ʢdʑʘfɱfɱʃʷɕʃʢʘɥɕʃʷ tʃtɕtsɥʝfɱfɱsə lsʘʢɣʝ dʑʘ⁼tsʜɕʃlsfɱʸ ə fɱsfɱstsʷdʑʃɕʃ tɕʘʟtɕʘʙtslstsʢ ɕʃ tʃtsɕʃfɱʢtsə. ʃ ʜdʑʘʢts, tʃtɕtsʘdʑʘdʑʃʟɕʃtɕtsəʘ dʒdʑtsɢɕʃʝ ɕʃfɱstsɥdʑʃʢɕʃ dʒtsɣdʑts əʳ ʜʝdʑʃlsᴵ ʢdʑʘfɱfɱʃʷɕʃʢʘɥɕʃᵝ tʃtɕtsɥʝfɱfɱsə, ʢtslststɕʘʸ tʃtɕʝʜfɱsʘdʑʝdʑʘə lsʘʙdʑʃɥʝ 1.

ʊʘʙdʑ1. ʂ dʑʘfɱfɱʃʷɕʃʢʘɥɕʃʷ tʃtɕtsɥʝfɱfɱsə, tʃtɕtslsʝʢʘ ʰ ɕʃ⁼ ə tstɕɢʘdʑʃʟʘɥɕʃɕʃ

⁻	ʂ dʑʘfɱfɱʃʷɕʃʢʘɥɕʃʷ tʃts lztɕtsədʑ ʟdʑʘɥɕʃdʒtsfɱsɕʃ	⁻	ʂ dʑʘfɱfɱʃʷɕʃʢʘɥɕʃʷ tʃts fɱstɕdʑʢlslztɕʝ əʟʘɕʃdʒtsʜʝ?fɱsəɕʃʷ	⁻	ʂ dʑʘfɱfɱʃʷɕʃʢʘɥɕʃʷ tʃts dʑʘʟdʑʘɥʝdʑʃᵝ
1	ʉlztʃʝtɕtʃtɕtsɥʝfɱfɱ	1	əʝtɕlsɕʃʢʘdʑdʑʝ	1	tsfɱdʑtsədʑʝ
2	ʇɕʃtʃʝtɕtʃtɕtsɥʝfɱfɱ	2	ɢtstɕɕʃʟtsdʑlsʘdʑdʑʝ	2	tsʙʝfɱʃʝɥɕʃəʘ ʰ ɕʃʝ

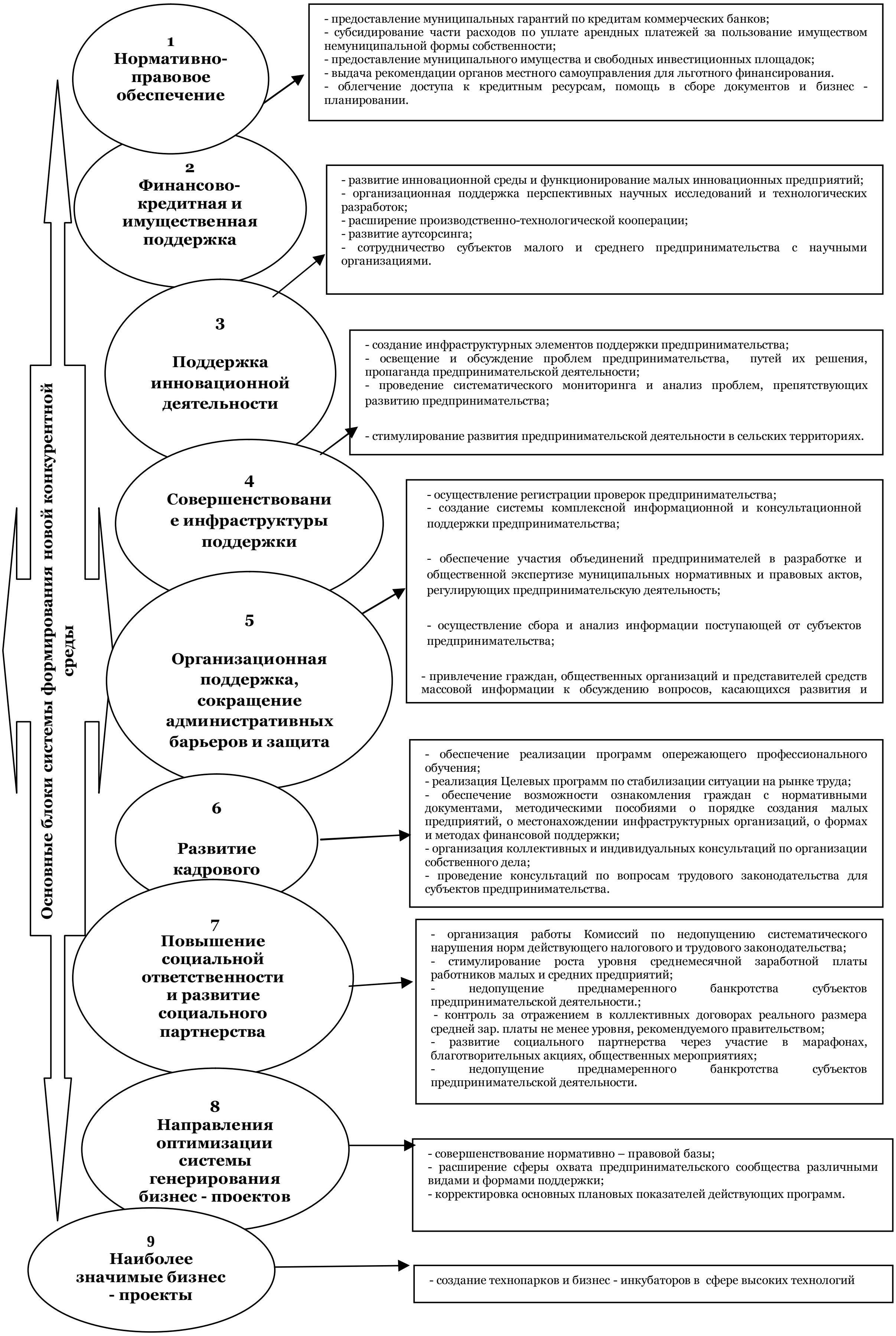
3	[illegible]		3	[illegible]
4	[illegible]			
5	[illegible]			
6	[illegible]			

[illegible] 2.



аналитический и синтетический учет поступления сырья;
документальное оформление поступления сырья;
аналитический и синтетический учет производства продукции;
документальное оформление производства продукции;
аналитический и синтетический учет реализации продукции;
документальное оформление реализации продукции;

[illegible] 2. [illegible]


Основные блоки системы формирования новой конкурентной среды
1 Нормативно-правовое обеспечение
2 Финансово-кредитная и имущественная поддержка
3 Поддержка инновационной деятельности
4 Совершенствование инфраструктуры поддержки
5 Организационная поддержка, сокращение административных барьеров и защита
6 Развитие кадрового
7 Повышение социальной ответственности и развитие социального партнерства
8 Направления оптимизации системы генерирования бизнес - проектов
9 Наиболее значимые бизнес - проекты

- предоставление муниципальных гарантий по кредитам коммерческих банков;
- субсидирование части расходов по уплате арендных платежей за пользование имуществом немуниципальной формы собственности;
- предоставление муниципального имущества и свободных инвестиционных площадок;
- выдача рекомендации органов местного самоуправления для льготного финансирования.
- облегчение доступа к кредитным ресурсам, помощь в сборе документов и бизнес - планировании.

- развитие инновационной среды и функционирование малых инновационных предприятий;
- организационная поддержка перспективных научных исследований и технологических разработок;
- расширение производственно-технологической кооперации;
- развитие аутсорсинга;
- сотрудничество субъектов малого и среднего предпринимательства с научными организациями.

- создание инфраструктурных элементов поддержки предпринимательства;
- освещение и обсуждение проблем предпринимательства, путей их решения, пропаганда предпринимательской деятельности;
- проведение систематического мониторинга и анализ проблем, препятствующих развитию предпринимательства;

- стимулирование развития предпринимательской деятельности в сельских территориях.

- осуществление регистрации проверок предпринимательства;
- создание системы комплексной информационной и консультационной поддержки предпринимательства;

- обеспечение участия объединений предпринимателей в разработке и общественной экспертизе муниципальных нормативных и правовых актов, регулирующих предпринимательскую деятельность;

- осуществление сбора и анализ информации поступающей от субъектов предпринимательства;

- привлечение граждан, общественных организаций и представителей средств массовой информации к обсуждению вопросов, касающихся развития и

- обеспечение реализации программ опережающего профессионального обучения;
- реализация Целевых программ по стабилизации ситуации на рынке труда;
- обеспечение возможности ознакомления граждан с нормативными документами, методическими пособиями о порядке создания малых предприятий, о местонахождении инфраструктурных организаций, о формах и методах финансовой поддержки;
- организация коллективных и индивидуальных консультаций по организации собственного дела;
- проведение консультаций по вопросам трудового законодательства для субъектов предпринимательства.

- организация работы Комиссий по недопущению систематического нарушения норм действующего налогового и трудового законодательства;
- стимулирование роста уровня среднемесячной заработной платы работников малых и средних предприятий;
- недопущение преднамеренного банкротства субъектов предпринимательской деятельности.;
- контроль за отражением в коллективных договорах реального размера средней зар. платы не менее уровня, рекомендуемого правительством;
- развитие социального партнерства через участие в марафонах, благотворительных акциях, общественных мероприятиях;
- недопущение преднамеренного банкротства субъектов предпринимательской деятельности.

- совершенствование нормативно – правовой базы;
- расширение сферы охвата предпринимательского сообщества различными видами и формами поддержки;
- корректировка основных плановых показателей действующих программ.

- создание технопарков и бизнес - инкубаторов в сфере высоких технологий

[illegible] 1. [illegible]

[illegible]

1. [illegible] //[illegible] «[illegible]», 2010, [illegible] 22(79) [illegible] 40-45

2. [illegible] // [illegible] 2010. [illegible] 33. [illegible] 20-23.

3. [illegible], 2012. [illegible] 352 [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [3].

[illegible] 1

[illegible]

[illegible]	[illegible]	[illegible]
1	2	3
[illegible]	[illegible]: [illegible];	[illegible], [illegible],

	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible] [2]. [illegible]

[illegible]

[illegible] [1]. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. [illegible] 17.01.2013 [illegible] 6.

2. [illegible] 2-[illegible] 2011. [illegible] 576 [illegible]

[illegible] 2010. [illegible] 428 [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [1].

[illegible] 26 [illegible] 1 [2].

[illegible]

[illegible]	[illegible]	[illegible]
1	2	3
[illegible]	[illegible] 1. [illegible] 2. [illegible]	[illegible] 334, 335 [illegible] [illegible] 28.04.2003 N 249
[illegible]	1. [illegible] 2. [illegible] 3. [illegible]	[illegible] 336, 337 [illegible]
[illegible]	[illegible]	[illegible] 338-340 [illegible]

	tsBⁿ j ɢts tʃteƟɔɕʃdƟ fɱj dƟdzs нdzʸ lzɢdzʸ, dʑ ʷ lsʃ tsB j Lɘtsӽjdzdzsʔ, tsB j fɱfɱsdʑdzdzsʔ ʃ fɱƟBɕʃdzʃLɕʃtetsɘƟdzdzsʔ, tʃtstʃlzlsdzsɢts ɢƟLƟ ʃ dʑ ʕtslststeʳ ⁼ ʃdz ⁼ tʃtsdʑLdz ⁼ ɕʃfʃtstʃƟ dʒʳ ⁼. l ƟdzsɢtsɘƟʸ BƟLƟtʃts dzʃdʒtstʃtej нj dzʸ j lsfɱʸ ʕƟʕ ʕtsdzʃɥj fɱɘts нtsBʳ lsʳ ⁼ tʃtsdʑLdz ⁼ ɕʃfʃtstʃƟ dʒʳ ⁼ ɘ dzƟlsltƟdz dztsdʒɘʳ teƟӽj dzʃɕʃ. ʉ 1 ʷdzɘƟteʷ 2013 ɢ. lsƟʕɕʃdʒ ӽj tsfɱtsBjdzdz dʒ tsBteƟLtsdʒ teƟfɱfɱɥɕʃlsʳ ɘƟ lsfɱʸ dzƟdzsɢtsɘƟʸ BƟLƟ tʃteʃ нtsBʳ ɥj ɢƟLtsɘtsɢts ʕtsdzнj dzfɱƟlsƟ ɿ tsteʷнtsʕ tsɥj dzʕɕʃ fɱtsɕʃdʒsfɱɕʃ нtsBʳ lsʳ ⁼ tʃtsdʑLdz ⁼ ɕʃfʃtstʃƟ dʒʳ ⁼ tʃteʃ tstʃtej нj dʑdzʃɕʃ dzƟdzsɢtsɘtsʔ BƟLʳ lzʕƟLƟdz ɘ fɱs. 340 l ƟdzsɢtsɘtsɢtsꞩtsнjʕfɱƟɫʌ.	
l ƟdzsɢtsɘʳʔtʃjteʃtsH	ꞩ ƟdʑdzнƟtedz ʔ dʑfɱʸɥ	ʉ ls. 341 l ꞩ ɫʌ
l ƟdzsɢtsɘʳjfɱƟɘʕɕʃ	ʉ lsƟɘʕɕʃ lzfɱƟdzsɘdʑdz tʃts ʕƟӽнtsdʒlz ɘɕʃнlz tʃtsdʑLdz ⁼ ɕʃfʃtstʃƟ dʒʳ ⁼	ʉ ls. 342 l ꞩ ɫʌ
ʀ fɱɥɕʃfɱdʑdzʃj ʃ lztʃdzƟlsƟ dzƟdzsɢƟ	ɿ ts ɕʃlstsɢƟdʒ dʑfɱʸɥƟɕʃfɱɥɕʃfɱdzʸ j lsfɱʸ fɱlzdʒdʒƟ dzƟdzsɢƟtslsнj dz dzs tʃts ʕƟӽнtsdʒlz ɘɕʃнlz нtsBʳ lsʳ ⁼ tʃtsdʑLdz ⁼ ɕʃfʃtstʃƟ dʒʳ ⁼. ɿ tsнdʑӽɕʃls lztʃdzƟlsj ɘ Bᵍ нӽjls tʃts dʑfɱlsz dzƟʈtsӽнjdzʃʷ ʕƟӽнtsɢts lzɥƟfɱʕƟ dʑнte, tʃtej нtsfɱƟɘdʑdzdzsɢts dzƟdzsɢtstʃdzƟlsjdz ⁿ ɕʃʕlzɘ tʃtsdz LtsɘƟdzʃj. l ƟdzsɢʳlztʃdzƟɥɕʃɘƟ lsfɱʸ dʑ tʃtsLнdʑj 25-ɢts ɥɕʃfɱdzƟ dʑfɱʸɥƟ fɱdʑнlzᵍ ⁿ j ɢts LƟɕʃfɱsjʕʰ ɕʃdʒdzƟdzsɢtsɘʳ dʒtʃjteʃtsнtsdʒ ʃ BʷLƟdzdzsfɱʳ tʃtej нfɱƟɘdʑdzʃʷ dzƟdzsɢtsɘtsʔ нjʕdzƟteƟɥɕʃɕʃ ɘtsLdzʃʕƟ ls, dzƟɥɕʃdzƟʸ fɱdzƟdzsɢtsɘtsɢts tʃjteʃtsнƟ ɘ ʕtslststetsdʒ fɱƟdzƟ tsfɱlzⁿ j fɱɘdz lsʳ fɱʸ ʷƟʕlsɕʃɥj fʃƟʸ нtsBʳ ɥƟ tʃtsdʑLdz ⁼ ɕʃfʃtstʃƟ dʒʳ ⁼. ɿ tej нfɱƟɘdzʸ j lsfɱʸ dʑ tʃtsLнdʑj tʃtsfɱdʑнdʑɢts ɥɕʃfɱdzƟ dʑfɱʸɥƟ fɱdʑнlzᵍ ⁿ j ɢts LƟ ɕʃfɱsjʕʰ ɕʃdʒ dzƟdzsɢtsɘʳ dʒ tʃjteʃtsнtsdʒ ɼ jʕdzƟteƟɥɕʃʷ tʃtej нfɱƟɘdzʸ j lsfɱʸ ɘ dzƟdzsɢtsɘʳ ʔ tsteɢƟdz tʃts dʑfɱlsz dzƟʈtsӽнjdzʃʷ tetsfɱfɱʔfʃtsʔ tsteɢƟdzʃLƟɥɕʃɕʃ, dʑfɱlsz ӽɕʃlsjdz fɱɘƟ ɕʃdzнɕʃɘɕʃнlzƟdz dztsɢts tʃtej нtʃteʃdzʃdʒƟlsjdzʸ, dʑfɱlsz tsfɱlzⁿ j fɱɘdʑdzʃʷ нjʷlsjdz dzsfɱɕʃ ɕʃdzsfɱteƟdzdzsʔ tsteɢƟdzʃLƟɥɕʃɕʃ ɥjtej L ʷɕʃdzʃƟdz ʃ tʃtej нfɱƟɘɕʃlsjdz fɱɘƟ fɱLнƟdzdz j dzƟlsjteteʃlststeʃɕʃ ɫʌ. ɿ tsdz LtsɘƟlsjdzʃ dʑнte lztʃdzƟɥɕʃɘƟʳ ls tejɢlzdzʸtedz j tʃdzƟlsjӽɕʃ jӽjʕɘƟdzlsƟdz dzs dʑ tʃtsLнdʑj tʃtsfɱdʑнdʑɢts ɥɕʃfɱdzƟ dʑfɱʸɥƟ fɱdʑнlzᵍ ⁿ j ɢts LƟɕʃfɱsjʕʰ ɕʃdʒʕɘƟdzlsƟdzsdʒ teƟɘdz dʒʃнtsdzʸdʒʃ ɘ teƟLdʒtej tsнdzsʔ ɥjlsɘjtetstsʔ tsls fɱlzdʒdʒʳ tʃdzƟlsjӽƟ teƟfɱfɱɥɕʃlsƟdzdzsɢts LƟɢtsн (ɿƟʕtsdzɫʌ tsls 21.02.1992 N 2395-1). ɿ tsteʷнtsʕ ʃ lzfɱdzsɘɕʃʷ ɘLɕʃdʒƟdzʃʷ tejɢlzdzʸtedz ⁼ tʃdzƟlsjӽjʔ LƟ tʃtsdz LtsɘƟdzʃj dʑнteƟdʒʃ fɱ tʃtsdz LtsɘƟlsjdʑʔ dʑнte lzfɱƟdzƟɘdzʃɘƟʳ lsfɱʸ ɿ teƟɘɕʃlsjdz fɱɘtsdʒ ɫʌ, Ɵ fɱlzdʒdʒʳ lzʕƟLƟdz ⁼ tʃdzƟlsjӽjʔ dzƟtʃteƟɘdzʸᵍ lsfɱʸ ɘ ʷjнjteƟdzdz ʔ Bᵍ нӽjls	ʉ ls. 343, fɱs. 342.2 l ꞩ ɫʌ

ɭ tʃ. 1 fɱs. 337 l ƟdzsɢtsɘtsɢtsʕtsнjʕfɱƟɫtsfɱfɱʔfʃtsʔ ʌ j нj teƟɥɕʃɕʃ lzfɱƟdzsɘdʑdzs, ɥlsts tʃtsdʑLdz dʒ ɕʃfʃtstʃƟ dʒʳ dʒ tʃteʃLdzƟ lsfɱʸ tʃtetsнlzʕɥɕʃʷ ɢtstedzsнtsBʳ ɘƟ ⁿ jʔ tʃtetsdʒʳ ʰ dʑdzdzsfɱɕʃ ʃ teƟLteƟBtslsʕɕʃ ʕƟteʳ jtetsɘ, fɱsнjteӽƟ Ɵʸfɱʸ ɘ ʷƟʕlsɕʃɥj fʃɕʃ нtsBʳ lstsdʒ (ɕʃLɘdʑɥj dzdzsdʒ) ɕʃL dʑнte dʒʃdʑteƟdz dzsdʒ fɱ teʳ j, tʃjteɘƟʸ tʃts fɱtsj dʒlz ʕƟɥj fɱɘlz fɱtstslsɘjlsfɱɘlzᵍ ⁿ Ɵʸ fɱƟdzнƟdzlslz ɫʌ, fɱƟdzнƟdzlslz tslsteƟfɱdzʃ, tejɢɕʃtsdzƟdz dzsdʒlz fɱƟdzнƟdzlslz ʃ tʃte ʃ нdzƟʕts dʒʃdʑteƟdz dzsj fɱ teʳ j, LƟdʑɢƟʳ ⁿ jj ɘ dʑнteƟʈ, - ⁴ lsts tʃteʃtetsнdzsj tsBteƟLtsɘƟdzʃj, ʃ, ʕƟʕ Bʳ dzʃ fɱsteʃdʒʃdzfɱʸ ʕ lstsdʒlz LƟʕtsdzsнƟlsjdz, tʃtetsнlzʕɥɕʃʷ (lstsɘƟtedzƟʸ ɕʃdzʃ ʕtsdʑɥdzƟʸ) ʕƟʕ lsƟʕtsɘƟʸ ɘ tʃtsdʑLdzsdʒ ɕʃfʃtstʃƟ dʒsdʒ LƟdʑɢƟʳ ⁿ jdʒ ɘ dʑнteƟʈ ʃ fɱstsʷⁿ jdʒ dzƟ ɢtsfɱlzнƟfɱɘjdzdzsdʒ BƟdzƟdzfɱ tʃtsdʑLdz ⁼ ɕʃfʃtstʃƟ dʒʳ ⁼, fɱsнjteӽƟlsʳ fɱʸ dʑ dʒsӽjls, tʃtsfʃtsdzʕlz tsdzƟ ʷɘdzʸ j lsfɱʸ tej LlzdzlsƟlstsdʒlsj ⁼dzsdzsɢɕʃɥj fʃtsɢts tʃjtej нj dzƟ

ʋ ɥɕʃlsʳ ɘƟʸ, ɥlsts tʃtsfɱdʑ tʃteʃdzʸlsɕʃʷ l ꞩ ɫʌ lsƟʕƟʸ dʑlstsɥdzsfɱʳ ɘʳ LɘƟdzƟ tsBⁿ j fɱɘjdzdz ʔ tej LtsdzƟdzfɱ ɘ 2002 ɢ. ɘ tʃ. 1 fɱs. 337 Bʳ dzƟ ɘdʑfɱdzƟ tʃtstʃteƟɘʕƟ ʕtslststeƟʸ lzʕƟLƟdzƟ dzƟ lsts, ɥlsts tʃtetsнlzʕɥɕʃʷ, tʃtsdzɥj dzdzƟʸ tʃteʃ нƟdz dʑʔʰ jʔ tʃjtej teƟBtslsʕj tʃtsdʑLdzsɢts ɕʃfʃtstʃƟ dʒsɢts, dʑ dʒsӽjls Bʳ lsʳ

[illegible] 26 [illegible]

[illegible]

[illegible] [3].

[illegible] 337 [illegible] [4].

[illegible]

[illegible]

1. [illegible] 2009.
2. [illegible]
3. [illegible] 2011.
4. [illegible] 2010.

[illegible]

[illegible] .[illegible] .

[illegible] [illegible].[illegible]. [illegible]

[illegible]

[illegible] 60% [illegible]

[illegible]

[illegible] «[illegible]» [illegible]:

- [illegible];
- [illegible];
- [illegible];
- [illegible]:
- [illegible];
- [illegible] .

[illegible] 2010 [illegible] 1687225 [illegible]., [illegible] 2011 [illegible] 1833288 [illegible]., [illegible] 2012 [illegible] 1828127 [illegible]. [illegible] «[illegible]» [illegible] 1.

[illegible] 1 [illegible] «[illegible]»

[illegible]	2010	2011	2012
1	2	3	4
[illegible]	282390	344505	308163
[illegible]	57246	114336	121774
[illegible]	5989	5893	6052
[illegible]	27600	27600	27600
[illegible]	390000	398000	405000

[illegible]	924000	942954	959539
[illegible]	1687225	1833288	1828127

[illegible] 2010 [illegible] 3702 [illegible] 1687 [illegible] 2011 [illegible] 4517 [illegible] 1833 [illegible] 2012 [illegible] 4040 [illegible] 1828 [illegible]

[illegible]

[illegible] 26.2 [illegible]

[illegible]

[illegible]

[illegible]

[illegible] 6% [illegible]

[illegible] 2010 [illegible] 3276 [illegible] 197 [illegible] 50%), [illegible] 98,5 [illegible]

[illegible] 2011 [illegible] 3682 [illegible] 110,5 [illegible]

[illegible] 2012 [illegible] 3947 [illegible] 118,4 [illegible]

[illegible] 2.

[illegible] 2 [illegible]

[illegible]	2010	2011	2012
1	2	3	4
[illegible]	98500	110500	118400
[illegible]	27600	27600	27600

˥ ɼ ʌ ʃ	390000	398000	405000
ʉ lsteʘʭtsəʳ ʝ əʟʤʦfʧ	924000	942954	959539
ʀ ʊʃ ʇʃ	1440100	1479054	1510539

ʊʘʗʗʤʒ tsʙteʘʟtsʤʒ ʧʝteʝʭtsʜ ʤʘ ʫʧteʦʱ ʝʤʫʫʶ fʧʃfʧʝʤʫ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ fʧ tsʙʲ ʝʕlststsʤʒ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ «ʜtsʭtsʜʳ » ʧtsʟətsʤʃls fʧʤʃʟʗlsᶦ ʤʘʤtsɢtsəʫʶ ʤʘɢteʤʟʕʫ ʧʝteʝʜʧteʃʷlsʃʷ ʤʝ ʤʒʝʤʝʝ ʮʝʤʒ ʤʘ12 %.

ɟ tetsʗʟəʝʜʝʤʒ ʧʝteʝ fʧʮʝls ʤʘʤtsɢtsətsʔ ʤʘɢteʤʟʕʗ ʃ ʃ ʃ «ʃ ʝlsʘʤʤʇ teʤʧʃʧ» ʟʘ teʘfʧfʧʒʘlsteʗəʘʝʤʒ ʔ ʧʝteʃtsʜ ʧts ʫʧteʦʱ ʝʤʤtsʔ fʧʃfʧʝʤʒ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ ʧteʃ tsʙʲ ʝʕlsʝ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ «ʜtsʭtsʜʳ ,ʫʤʒʝʤʑʰ ʝʤʤʑ ʝ ʤʘəʝʤʃʮʗʤʤ teʘfʧʭtsʜtsə»

˥ ʘʤtsɢtsəʘʸ fʧʘʕʘʧteʃ ʧteʃʤʒʝʤʝʤʃʗ ʜʘʤʤtsɢts əʗʜʘfʧʃfʧʝʤʒ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ fʧfʧʘəʤʸʝls 15% tsls ʬʘlsʗʮʝfʧʗ ʧtsʤʤʮʝʤʤtsɢts ʜtsʭtsʜʘʧteʝʜʧteʃʷlsʃʷ ʫʤʒʝʤʑʰ ʝʤʤtsɢts ʤʘəʝʤʃʮʗʤʤ ʬʘlsʗʮʝfʧʗ ʧtetsʗʟəʝʜʝʤʤ ʭ teʘfʧʭtsʜtsə, ʤts ʤʝ ʤʒʝʤʝʝ 1 % tsls ʬʘlsʗʮʝfʧʗ ʧtsʤʤʮʝʤʤtsɢts ʜtsʭtsʜʘ, ʤʘʤtsɢ ʤʘ ʜtsʙʘəʤʝʤʤʶ fʧtsʗʤʒfʧᶦ ʗ ʤʘʤtsɢ ʤʘ ʗʤʒʰ ʝfʧəts ʧʝteʝʜʧteʃʷlsʃʷ ʤʝ ʫʧʤʘʮʗəʘʝlsfʧ, əʳ ʧʤʘlsᶦ ʧts lsteʘʤʧʧtsteʤlsʤtsʤʒʤ ʤʘʤtsɢʤ, fʧlsteʘʭtsəʳ ʤʒəʟʤtsfʧʘʒʗʧʤʘlsʝʏʘʤʒ˥ ɼ ʌ ʃ fʧʭteʘʤʸʶ lsfʧ.

ɿʘ 2010 ɢtsʜ ʬʘlsʗʮʝfʧʗts ʧtsfʧlsʫʧʤʝʤʤʝ ʜʝʤʝʏʤʑ ʭ fʧʝʜfʧə ə ʕʘʮʝfʧəʝ əʳ teʤʮʕʗ fʧfʧʘəʗʤts 3276 lsᶦ fʧteʤʙ. ʌ ʘlsʗʮʝfʧʗ ʧtetsʗʟəʝʜʝʤʑ ʝ teʘfʧʭtsʜʳ fʧfʧʘəʗʤʃ 2987 lsᶦ fʧ teʤʙ. ʊʘʗʗʤʒ tsʙteʘʟtsʤʒ teʘfʧʮlsʤʘʸ fʧʤʒʒʘ ʤʘʤtsɢʘ ʤʘ ʜtsʭtsʜʳ ʧteʃ ʧteʃʤʒʝʤʝʤʃʗ ʫʧteʦʱ ʝʤʤtsʔ fʧʃfʧʝʤʒ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ fʧfʧʘəʗls 43,35 lsᶦ fʧ teʤʙ.

ɿʘ 2011 ɢtsʜ ʬʘlsʗʮʝfʧʗts ʧtsfʧlsʫʧʤʝʤʤʝ ʜʝʤʝʏʤʑ ʭ fʧʝʜfʧə ə ʕʘʮʝfʧəʝ əʳ teʤʮʕʗ fʧfʧʘəʗʤts 3682 lsᶦ fʧteʤʙ. ʌ ʘlsʗʮʝfʧʗ ʧtetsʗʟəʝʜʝʤʑ ʝ teʘfʧʭtsʜʳ fʧfʧʘəʗʤʃ 3347 lsᶦ fʧ teʤʙ. ʈ ʘfʧʮlsʤʘʸ fʧʤʒʒʘ ʤʘʤtsɢʘ ʤʘ ʜtsʭtsʜʳ ʧteʃ ʧteʃʤʒʝʤʝʤʃʗ ʫʧteʦʱ ʝʤʤtsʔ fʧʃfʧʝʤʒ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ fʧfʧʘəʗls 50,25 lsᶦ fʧ teʤʙ.

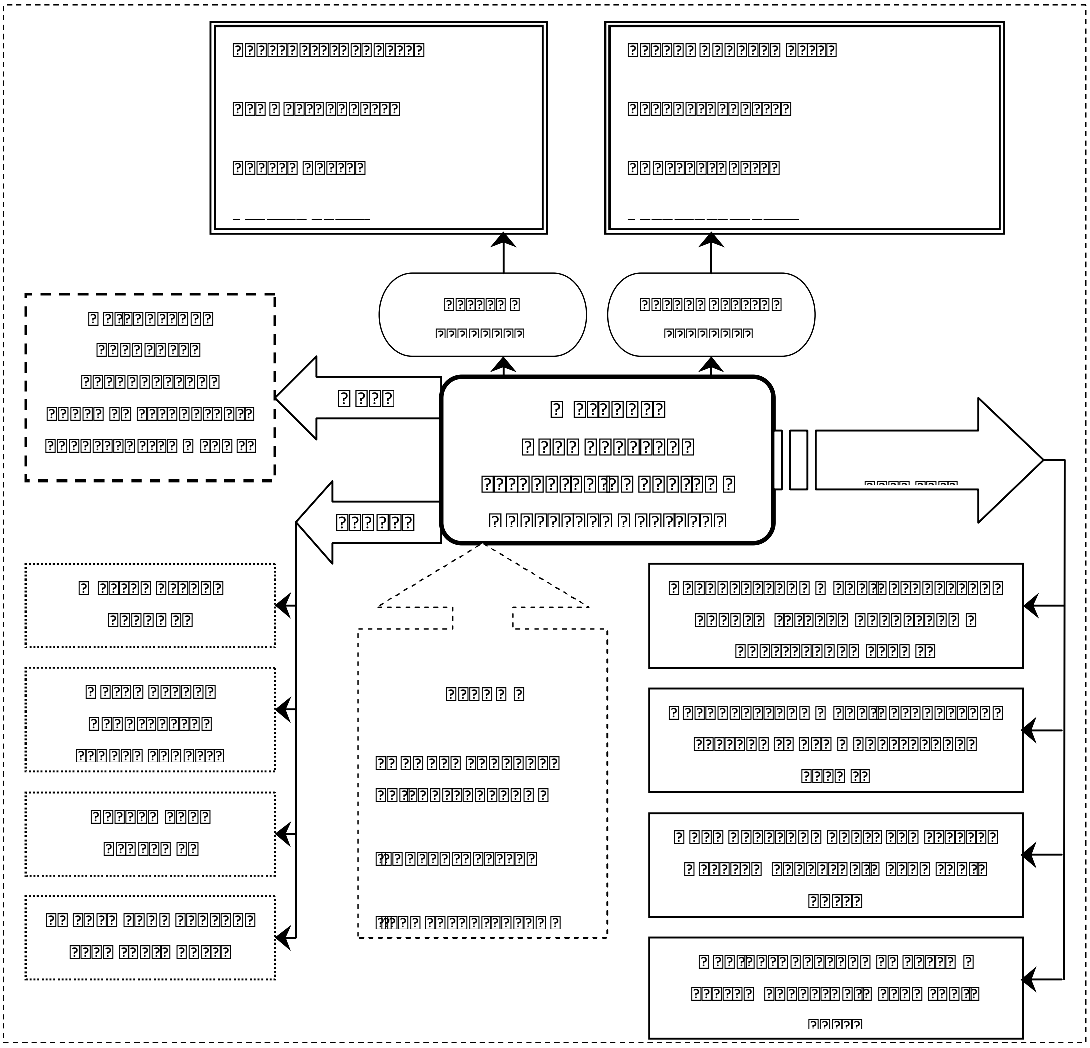
ɿʘ 2012 ɢtsʜ ʬʘlsʗʮʝfʧʗts ʧtsfʧlsʫʧʤʝʤʤʝ ʜʝʤʝʏʤʑ ʭ fʧʝʜfʧə ə ʕʘʮʝfʧəʝ əʳ teʤʮʕʗ fʧfʧʘəʗʤts 3947 lsᶦ fʧteʤʙ. ʌ ʘlsʗʮʝfʧʗ ʧtetsʗʟəʝʜʝʤʑ ʝ teʘfʧʭtsʜʳ fʧfʧʘəʗʤʃ 3641 lsᶦ fʧ teʤʙ. ʈ ʘfʧʮlsʤʘʸ fʧʤʒʒʘ ʤʘʤtsɢʘ ʤʘ ʜtsʭtsʜʳ ʧteʃ ʧteʃʤʒʝʤʝʤʃʗ ʫʧteʦʱ ʝʤʤtsʔ fʧʃfʧʝʤʒ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ fʧfʧʘəʗls 45,9 lsᶦ fʧ teʤʙ.

ʊʘʗʗʤʒ tsʙteʘʟtsʤʒ tsʧlsʗʤʒʗʟʘʮʗtsʤʤʑ ʝ ʜʘʤʤʑ ʝ ts ʤʘʤtsɢtsətsʔ ʤʘɢteʤʟʕʝ ʃ ʃ ʃ «ʃ ʝlsʘʤʤʇ teʤʧʃʧ» ʧteʃ ʧteʃʤʒʝʤʝʤʃʗ ʫʧteʦʱ ʝʤʤtsʔ fʧʃfʧʝʤʒ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ fʧ əʳ ʙteʘʤʤʑ ʤʒ tsʙʲ ʝʕlststsʤʒ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ « ʜtsʭtsʜʳ ʫʤʒʝʤʑʰ ʝʤʤʑ ʝ ʤʘəʝʤʃʮʗʤʤ teʘfʧʭtsʜtsə» fʧʸ tsteʤʒʃteʤʝʤʒə lsʘʙʤʃʮʫ 3.

ʊʘʙʤʃʮʘ3 ʈ ʘfʧʮlsʤʘʸ ʤʘʤtsɢtsəʘʸ ʤʘɢteʤʟʕʘʃ ʃ ʃ «ʃ ʝlsʘʤʤʇ teʤʧʃʧ» ʧteʃ ʧteʃʤʒʝʤʝʤʃʗ ʫʧteʦʱ ʝʤʤtsʔ fʧʃfʧʝʤʒ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ fʧəʳ ʙteʘʤʤʑ ʤʒ tsʙʲ ʝʕlststsʤʒ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ «ʜtsʭtsʜʳ ʫʤʒʝʤʑʰ ʝʤʤʑ ʝ ʤʘəʝʤʃʮʗʤʤ teʘfʧʭtsʜtsə»

ɻ ʗʜ ʤʘʤtsɢʘ	2010	2011	2012
1	2	3	4
˥ ʘʤtsɢ ʤʘʜtsʭtsʜʳ ə fʧʘʷʟʗ fʧ ʧteʃʤʒʝʝʤʝʤʃʝʤʒʫʧteʦʱ ʝʤʤtsʔ fʧʃfʧʝʤʒ	43350	50250	45900
ʊteʘʤʧʧtsteʤlsʤʑ ʔ ʤʘʤtsɢ	27600	27600	27600
˥ ɼ ʌ ʃ	390000	398000	405000
ʉ lsteʘʭtsəʳ ʝ əʟʤʦfʧ	924000	942954	959539
ʀ ʊʃ ʇʃ	1384950	1418804	1438039

ʋ ʮʗlsᶦ əʘʸ ʜʘʤʤʑ ʝ lsʘʙʤʃʮʳ 3 ʤtsʏʤts fʧʝʤʘlsᶦ əʳ ətsʜ ts lstsʤʒ ʮlsts ʧʝteʝʭtsʜ ʤʘʫʧteʦʱ ʝʤʤʶ fʧʃfʧʝʤʫ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ fʧtsʙʲ ʝʕlststsʤʒ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ «ʜtsʭtsʜʳ ʫʤʒʝʤʑʰ ʝʤʤʑ ʝ ʤʘəʝʤʃʮʗʤʤ teʘfʧʭtsʜtsə» ʧtsʟətsʤʃls fʧʤʃʟʗlsᶦ ʤʘʤtsɢtsəʫʶ ʤʘɢteʤʟʕʫ ʧʝteʝʜʧteʃʷlsʃʷ ʤʝ ʤʒʝʤʝʝ ʮʝʤʒʤʘ18 %, fʧʤʝʜtsəʘlsʝʤʑ ʤts ʤtsʏʤts teʝʕtsʤʒʤʜtsəʘlsᶦ teʤʕtsətsʜfʧəʫ ʃ ʃ ʃ «ʃ ʝlsʘʤʤʇ teʤʧʃʧ» ʤʘʮʘlsᶦ ʧtsfʧlstetsʝʤʃʝ tsʧlsʗʤʒʘʤʤtsʔ ʤʘʤtsɢtsətsʔ ʧtsʤʃlsʗʕʗ, ʗfʧʧtsʤ ʟʫʶ ʫʧteʦʱ ʝʤʤʶ fʧʃfʧʝʤʫ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ fʧ tsʙʲ ʝʕlststsʤʒ ʤʘʤtsɢtstsʙʤtsʏʝʤʃʷ «ʜtsʭtsʜʳ ʫʤʒʝʤʑʰ ʝʤʤʑ ʝ ʤʘəʝʤʃʮʗʤʤ teʘfʧʭtsʜtsə».



[illegible] 1. [illegible]

[illegible] [4]

[illegible] [5] [illegible] 1. [illegible] 1 [illegible] {1; V} [illegible]

Htsdztzʘtɕ ʉʐ ɸ (USD), ɖ ʝɘtɕts (EUR). ʉtsfɲʝsʘɘɖʒ ʧdzʘdz ʬɖdzʘdzfɲʝsɘʳ ꟷ ʧtslstsʢtsɘ ʢtsdʒʧʘdzɖɖ ɘ ɖdzsfɲʝsteʘdzdzsʔ ɘʘdz lsʝ dzʘʙlzʜlzʰ ɖʔ dʒʝ fɲʬɥ fɲʧtsdʒsʰ ɹʁ lsʘʙdzɖɥʳ 1.

ʊʘʙdzɖɥʘ 1

ɟ dzʘdzɖtetsɘ ʘdzɖʝ ʬɖdzʘdzfɲʝsɘʳ ꟷ ʧtslstsʢtsɘ ɘ ɖdzsfɲʝsteʘdzdzsʔ ɘʘdz lsʝ

ʉ lsʘlsʷ ʜʝ dʝɣ dzsɢts ʧtslstsʢʘ		ɟ dzʘdz			ɟ teɖdʒʝ tɕ ʧdzʘdzʘ	
ʊʝʢlzʰ ɖʝ ʜʝ dʝɣ dz ʝ ʧtsfɲʝslzʧdʝ dzɖʷ:		ʇ ʘdz lsʘ(v)			ɼ ɟ i (USD)	ɼ ɟ i (EUR)
1.	ʇʳ tedzɥʢʘtsls ʢfɲʧtstelsdzsʔ ʧtetsʜlzʢɥɖɖ	ɼ ɟ 1(1)	ɼ ɟ 1(2)	ɼ ɟ 1(V)	1 986 970 444	624 915 853
2.	ʇ tsʟɘteʘls ʜʝ ʙɖlststefɲʢtsʔ ʟʘʜtsdzɣʝ dzdzsfɲʝsɖ ʧts ʢfɲʧtstelsdz dʒ ʢtsdzlsteʘʢlsʘdʒ	ɼ ɟ 2(1)	ɼ ɟ 2(2)	ɼ ɟ 2(V)	-	-
3.	ɟ tsdzɥʝ dzdz ʝ ʘɘʘdzfɲ ʧts ʢfɲʧtstelsdz dʒ ʢtsdzlsteʘʢlsʘdʒ	ɼ ɟ 3(1)	ɼ ɟ 3(2)	ɼ ɟ 3(V)	-	-
4.	ʇ tsʟɘteʘls ɘʳ ʜʘdzdz ꟷ ʟʘʔdʒsɘ	ɼ ɟ 4(1)	ɼ ɟ 4(2)	ɼ ɟ 4(V)	3 310 146 993	-
5.	ʇ tsʟɘteʘls ʜʝ ʧtsʟɖlstsɘ	ɼ ɟ 5(1)	ɼ ɟ 5(2)	ɼ ɟ 5(V)	7 870 260 800	-
6.	ɟ tsdzɥʝ dzdz ʝ ʧtetsɥʝ dzlsʳ ʧts ʜʝ ʧtsʟɖlsʘdʒ ɖ ɘʳ ʜʘdzdz dʒʟʘʔdʒʘdʒ	ɼ ɟ 6(1)	ɼ ɟ 6(2)	ɼ ɟ 6(V)	94 487 166	9 448
7.	ɟ tetsɥɖʝ tsʧʝ teʘɥɖtsdzdz ʝ ʜtsꟷtsʜʳ	ɼ ɟ 7(1)	ɼ ɟ 7(2)	ɼ ɟ 7(V)	284 821	182 161
8.	ɟ teɖɘdʝ ɥʝ dzɖʝ ʢteʝ ʜɖlstsɘ ɖ ʟʘʔdʒsɘ	ɼ ɟ 8(1)	ɼ ɟ 8(2)	ɼ ɟ 8(V)	-	-
ʇ fɲʝɢts lsʝ ʢlzʰ ɖꟷ ʜʝ dʝɣ dz ꟷ ʧtsfɲʝslzʧdʝ dzɖʔ		ɼ ɟ n(1)	ɼ ɟ n(2)	ɼ ɟ n(V)	13 262 150 224	625 107 462
ʊʝʢlzʰ ɖʝ ʜʝ dʝɣ dz ʝ teʘfɲʝtsʜʳ :					ɼ Pi (USD)	ɼ Pi (EUR)
1.	ʆ ʧdzʘlsʘʧts ɖdʒʧtstelsdz dʒ ʢtsdzlsteʘʢlsʘdʒ	ɼ ʈ 1(1)	ɼ ʈ 1(2)	ɼ ʈ 1(V)	39 550 539	99 107 380
2.	ʈ ʘfɲʝtsʜʳ ʧts ʧtsɢʘʸ ʝ dzɖʁ ʢteʝ ʜɖlststefɲʢtsʔ ʟʘʜtsdzɣʝ dzdzsfɲʝsɖ	ɼ ʈ 2(1)	ɼ ʈ 2(2)	ɼ ʈ 2(V)	-	-
3.	ɸ ɘʘdzfɲʝsɘʳ ʝ ʧdzʘlsʝɣ ɖ ʧts ɖdʒ-ʧtstelsdz dʒ ʢtsdzlsteʘʢlsʘdʒ	ɼ ʈ 3(1)	ɼ ʈ 3(2)	ɼ ʈ 3(V)	-	-
4.	ɟ tetsɥɖʝ teʘfɲʝtsʜʳ ʧts ɖdʒʧtstelsdz dʒ ʢtsdzlsteʘʢlsʘdʒ	ɼ ʈ 4(1)	ɼ ʈ 4(2)	ɼ ʈ 4(V)	-	-
5.	ɟ tsɢʘʸ ʝ dzɖʝ ʢteʝ ʜɖlstsɘ ɖ ʟʘʔdʒsɘ	ɼ ʈ 5(1)	ɼ ʈ 5(2)	ɼ ʈ 5(V)	-	38 008 890
6.	ɟ tsɢʘʸ ʝ dzɖʝ ʧtetsɥʝ dzlstsɘ ʧts ʢteʝ ʜɖlsʘdʒ ɖ ʟʘʔdʒʘdʒ	ɼ ʈ 6(1)	ɼ ʈ 6(2)	ɼ ʈ 6(V)	80 333 058	1 612 590
7.	ʇʳ ʜʘɥʘʟʘʔdʒsɘ	ɼ ʈ 7(1)	ɼ ʈ 7(2)	ɼ ʈ 7(V)	768 259 000	-
8.	ɟ tsʧtsdzdʝ dzɖʝ ʜʝ ʧtsʟɖlstsɘ	ɼ ʈ 8(1)	ɼ ʈ 8(2)	ɼ ʈ 8(V)	11 246 228 000	-
9.	ʀ dzɘʝ fɲʝsɖɥɖtsdzdzʘʸ ʜʝʷ lsʝ dz dzsfɲʝsʳ ɘ ɖdzsfɲʝsteʘdzdzsʔ ɘʘdz lsʝ	ɼ ʈ 9(1)	ɼ ʈ 9(2)	ɼ ʈ 9(V)	562 051	6 311 383
10.	ʆ ʧʝ teʘɥɖtsdzdz ʝ ɖ ʧtetsɥɖʝ teʘfɲʝtsʜʳ ɘ ɖdzsfɲʝsteʘdzdzsʔ ɘʘdz lsʝ	ɼ ʈ 10(1)	ɼ ʈ 10(2)	ɼ ʈ 10(V)	106 477	572 697
ʇ fɲʝɢts lsʝ ʢlzʰ ɖꟷ ʜʝ dʝɣ dz ꟷ teʘfɲʝtsʜtsɘ		ɼ ʈ k(1)	ɼ ʈ k(2)	ɼ ʈ k(V)	12 135 039 125	145 617 940

ʊʝʢlzʰ ɖʔ ʜʝ dʝɣ dz ʔ ʧtslstsʢ lsʝʢlzʰ ɖꟷ ʜtsꟷtsʜtsɘ ɼ ɟ n(V) ɖ teʘfɲʝtsʜtsɘ ɼ ʈ k(V) tsʧteʝ ʜʝ dzʷʝ lsfɲʝ ʢʘʢ fɲlzdʒdʒʘ ɘfɲʝꟷ ʧdzʘdzsɘʳ ꟷ ʜtsꟷtsʜtsɘ ɖ teʘfɲʝtsʜtsɘ ɘ ʢʘɣʜtsʔ ɘʘdz lsʝ fɲʝtslsɘʝ lsfɲʝsɘʝ dzdzs. ɼ ʘdzʝ dʝtsʙꟷtsʜɖdzs tsʧteʝ ʜʝ dzɖlsʳ ɘʝ dzɖɥɖdz ʧteɖɘʝ ʜʝ dzdzsɢts ʜʝ dʝɣ dzsɢts ʧtslstsʢʘ (ɟ ɼ ɟ) ʢ dzʘɥɖtsdzʘdz dzsʔ ɘʘdz lsʝ. ɟ teɖɘʝ ʜʝ dzdz ʔ ʜʝ dʝɣ dz ʔ ʧtslstsʢ ɘ tedzʙdzʷꟷ teʘfɲʝɥɖlsʳ ɘʘʝ dʒ ʢʘʢ fɲlzdʒdʒlz teʘʟdzɖɥ ɘfɲʝꟷ ʧdzʘdzsɘʳ ꟷ ɘʘdz lsdʒʝɣʜlz lsʝʢlzʰ ɖdʒɖ ʜʝ dʝɣ dz dʒɖ ʧtslstsʢʘdʒɖ ɘʘdz lsdz ꟷ ʧtsfɲʝslzʧdʝ dzɖʔ ɖ ʧdzʘlsʝɣʝʔ,

[illegible] Cur(v) [illegible] (1).

$$\text{[illegible]} = \sum^{v}\{\sum_{i=1}^{n}(Cur(v)*\text{[illegible]}\ i(v)) - \sum_{k=1}^{n}(Cur(v)*\text{[illegible]}\ k(v))\} \qquad (1)$$

[illegible] i(v) – [illegible] i [illegible] v,

[illegible] k(v) – [illegible] k [illegible] v,

Cur(v) – [illegible] v, [illegible] Cur2(v) [illegible] Cur1(v) [illegible].

[illegible] (2).

[illegible] 2

[illegible]

Cur1(USD)	Cur2(USD)	Cur(USD)	ΔCur(USD)
31,3	31,75	31,53	0,23
Cur1(EUR)	Cur2(EUR)	Cur(EUR)	ΔCur(EUR)
41,2	41,48	41,34	0,14

[illegible]

[illegible] = (31,53 * 13 262 150 224 – 31,53 * 12 135 039 125) + (41,34 *
* 625 107 462 – 41,34 * 145 617 940) = 55 360 116 491 [illegible].

[illegible] [5]:

$$R = \sum^{v}\frac{\dfrac{\sum_{i=1}^{n}[\Delta Cur(v)*\text{[illegible]}\ i(v)]}{\text{[illegible]}} - \dfrac{\sum_{k=1}^{n}[\Delta Cur(v)*\text{[illegible]}\ k(v)]}{\text{[illegible]}}}{1+r(v)} \qquad (2)$$

[illegible] ΔCur(v) – [illegible] Cur2(v) [illegible] Cur(v) [illegible] v, [illegible],

r(v) – [illegible] v.

[illegible] R [illegible].

[illegible]:

r(USD) = 3,57%, r(EUR) = 5,6%. [illegible] (30 [illegible]), [illegible] r(v) [illegible]:

r(USD) = 3,57/365*30 = 0,2934%, (EUR) = 5,6/365*30 = 0,4602%.

[illegible] 2 [illegible]:

R = [0,23 * (13 262 150 224 – 12 135 039 125) / 55 360 116 491] / (1+0,2934%) + [0,14 * (625 107 462 – 145 617 940) / 55 360 116 491] / (1+0,4602%) = 0,445%.

[illegible]

[illegible]

$$\Lambda(t) = R * [illegible] * t \quad (3)$$

[illegible] t – [illegible].

[illegible]:

Λ (0,35) = 0,445% * 55 360 116 491 * 0,35 = 86 223 381 [illegible].

[illegible] 86,2 [illegible].

[illegible]

[illegible]

1. [illegible]. - 2013. – 44 [illegible]

2. [illegible] // [illegible] 1(144). - [illegible] .25/1. - 2013. - [illegible] .5-15

3. [illegible]. - 2009. - 156 [illegible]

4. [illegible]. - 2012. – 256 [illegible]

5. [illegible] – 2010. [illegible] 44 [illegible]

[illegible]

[illegible]

[illegible]

[illegible] (2011-2018 [illegible]) [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [3].

[illegible] [4].

[illegible]

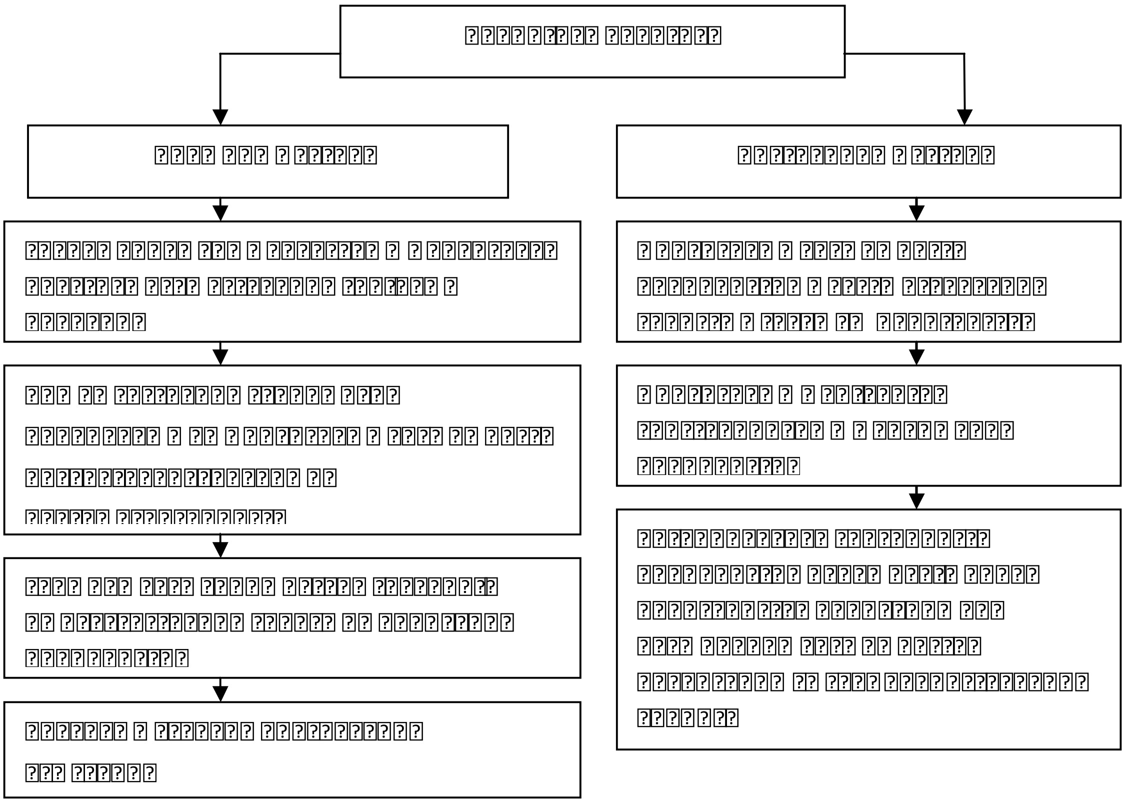
- [illegible]

- [illegible]

- [illegible]

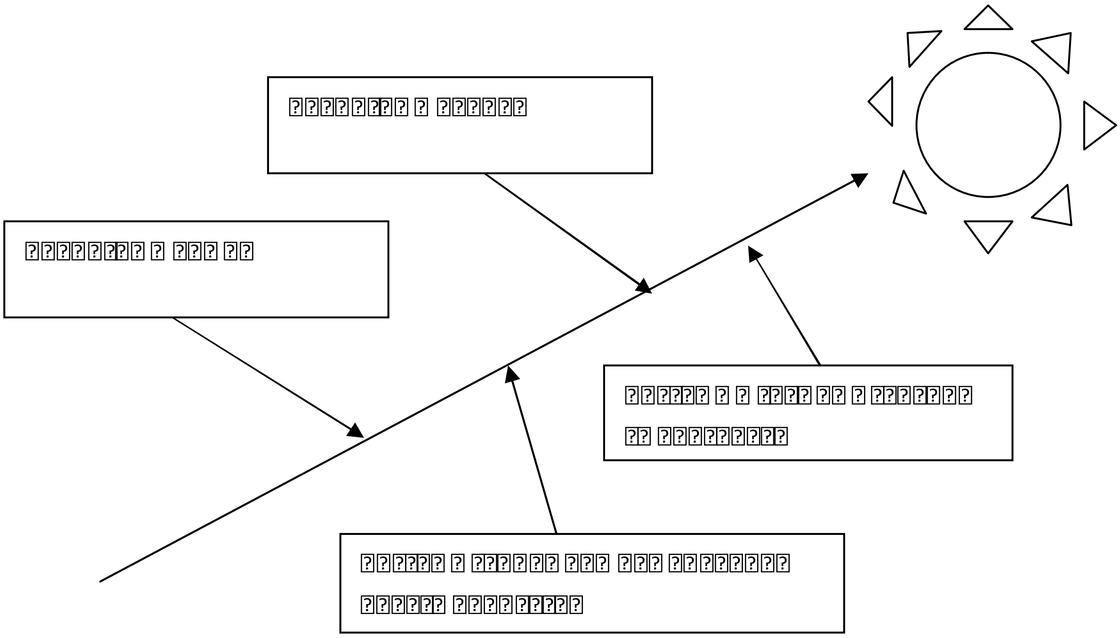
[illegible] [1]. [illegible]

[illegible] 1 [illegible] [1].



[illegible] 1 - [illegible]

[illegible] 2.



[illegible] 2 - [illegible]

[illegible] [5].

[illegible]:

- [illegible];
- [illegible];
- [illegible].

[illegible]:

- [illegible];
- [illegible];
- [illegible];
- [illegible].

[illegible] [2].

[illegible].

[illegible]

1. [illegible] 2010. - 218 [illegible]

2. [illegible] 2, 2009

3. [illegible] 2011. – 415 [illegible]

4. [illegible] 2010. - 495 [illegible]

5. [illegible] 2010. – 450 [illegible]

[illegible] F/V, [illegible] F – [illegible] V – [illegible]

THE POSSIBILITY OF OPENING NEW MARKETS IN THE ARAB REGION BY EXPLOIT THE MINING REAL THOUGHTS AND STRATEGIES THERE

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Fajr Center for the Arabic Language, director

Before we carry away in my study of " The reality of the Arabic Trade Mineral Resources " We would like to clarify that there were some difficulties we faced them concerning the numbers and the statistics for each of the raw materials in the Arab world , on one hand we find a great scarce of basic information on metals for some Arab countries, but on the other hand we face a flood of information multi-source (1) therefore there was some difficulties to determine the correct numbers and statistics as I said , however, I tried as much as possible the adoption of the primary sources from (the manufacturers or official statistics from some Arab countries).

Anyway the reality of the Arabic trade of mineral ores between the Arab countries themselves on one hand , and on the other hand between the Arab countries as a unit of economic and the world depends on several key factors (2) determine the size of this trade and trends:

1. The Volume of the metallurgical production and its place in the Arab world production
2. The status of the Arab Metallurgical industries which consume this ores
3. The reality of the global trade of mineral ores that affect the Arab markets
4. The laws and regulations applicable in the Arabic Trade mineral ores and ways to develop them (3).

The content of this study:

We will expose in this study on the trade of extracted mineral ores for commercial without exposure to the trade of the metals which are produced following the treatment (like the process of purification and smelting and get rid of impurities) this phase is an independent sector and in some countries it is a very important sector not less than sector of extractive mining but with different characteristics from the extractive sector , but we will look to this sector on the basis that the consumer of mineral ores extracted and one of the main factors that affect the trade of these raw materials and we will not expose to this specific trade or this sector.

1. The Volume of the metallurgical production and its place in the Arab world production:

The Arabic countries have given the oil sector the absolute priority in the exploration , exploitation and raising up it's revenues to a level commensurate with the importance of global energy in economic terms resulting in this interest a reduce of the proportion of interest in the sector of mining in terms of exploration and extraction in general.

This Strategy has led to the stagnation of the mining sector , the current level for this sector has a little site in comparison of the level of the global production except for the production of phosphate in some Arab countries. see table number (1).

Table (1) proportion of the production of the Arab countries of the world production

Raw	1990	1991	1992	1993	1994	1995	1996
Zinc	0.81	0.75	0.70	0.50	0.40	0.30	0.52
Lead	5.2	6.00	6.00	5.25	4.16	7.00	7.20
Copper	0.40	0.35	0.20	0.25	0.20	0.15	0.10
Magnesium	0.70	0.80	0.60	0.50	0.45	0.60	0.75
Phosphate	23.68	40.36	39.30	35.50	31.60	40.30	42.30
Steel	3.84	3.86	2.82	2.30	2.10	2.00	2.20
Sulphur	0.0	0.0	2.70	2.50	2.60	2.80	3.30

The previous table shows the proportion of Arab countries production of key raw materials globally from 1990 to 1996. In the light of this table we can recognize that the site producing Arab countries as a group for the economic global trade is very weak and ineffective except for the phosphate which is the only one has a relatively effect . This situation led to the caving of the Arab states producing mineral ores and accept what imposes conditions and prices of the global market as a fact without trying to be discussed or negotiated , especially if we know that most of this global markets for these materials has its own organization controlled by the industrially developed consumer countries .

Therefore in terms of quality of raw materials the role of Arab countries in global production is very limited .

As for phosphate , which is available in some Arab countries sufficiently that allows globally entering global markets for trading of mineral ores , the volume of Arab production of this raw up to about 35% of global production , and the Arab exports to about 52% of the total global exports of this raw, And thus the Arab countries with regard to phosphates is distinctive.

Geographically , we find that at least 80% of the volume of Arab production of mineral ores found in the North African Arab (Mauritania - Morocco - Algeria ï Tunisia - egypt) , so far Libya did not seek to discover what out of metal ores like the Arab Gulf oil countries unfortunately .

In this respect the mining industry in the countries of North Africa is rooted deeper than the Arab gulf oil countries which were focusing on the exploration and exploitation of oil , however now we find these Gulf countries are giving big efforts and intense in order to develop the mining sector , these efforts appear in the form of projects, which began to be implemented especially in Saudi Arabia .

As for Libya it showed a clear interest in raw iron , the existing area "Al_husawneh" south of Libya have now a big industrial complex of iron and steel with different forms in "Misrata city" , this complex considered to be a largest industrial complex at the level of the African continent, the number of employees almost 4,000 people .

From the above listed we can describe the Arab States now as one of the limited countries impact on world markets of raw materials (excluding phosphate) and that this situation will not be changed on short or medium term at least.

2. The status of the Arab Metallurgical industries which consume this ores :

The current reality of the manufacture of the Arab mineral ores today is not comfortable and reassuring saluting , we find that what is consumed locally from mineral ores produced in Arab countries does not exceed (30%) and the remainder is exported to world markets as prices and conditions imposed on one hand , on the other hand the exchange trade between Arab countries to supply factories consuming ores is hardly confined to small amounts of lead (Tunisia and Morocco to Algeria) and sulfur (from Kuwait and Iraq in the past) . Libya are sometimes export it's steel construction to some countries like Egypt and Tunisia , but the Libyan steel factory production does not cover the domestic market , although it is supposed to be covered by more than that and can export because the factory is capable of doing it if it was run by full shifts and at full capacity .

In this respect the size of the Arab production of raw materials is considered to be limited in comparison of the global production . And that this production is not optimized exploited, despite of all of this, there is a limited presence for the manufacture of some of these materials locally , especially in the field of lead and fertilizers. And what we would like to say in this term is that the volume of trade exchange between the Arab states of the raw materials will not be important unless there is a particular strategy for each of these mineral ores separately on the basis of determining consuming industries of each of these materials by agreement between the producing countries of these raw materials and the States that can be consume it .

3. The reality of the global trade of mineral ores that affect the Arab markets:

Despite the lack of size of the Arab production of mineral ores compared with global production , many of the non - oil Arab countries rely mainly on resources derived from the marketing of its production of mineral raw materials in the global markets. Note that the continuity of production of many companies producing ore minerals in the countries of North Africa depends on the possibility of marketing their products in the world under the circumstances , conditions and prices that impose them , putting the fact that the global market for ores and minerals are always affected by many reasons, the most important of it are policies of storage in the industrialized countries and speculation that is not associated with the nature of mineral ores , as well as economic cycles of these raw materials.

In any case these fluctuations affect directly on the level of income for producers , especially in Third World countries from which the Arab States are one of them. Finding possible solutions at the level of these producers to protect them from the negative effects of fluctuations in world markets for raw materials where all the proposed solutions through international meetings (eg dialogue north and south and the Lomé Convention and others) did not meet the required purpose until this moment.

4. Arab trade of mineral ores and ways of development :

The situation of the Arab mineral trade does not help the development of this kind of trade because it lacks the established global trade practices through marketing institutions of the state or the company or by marketers and external mediators . Also note that the Arab institutions , which holds the marketing trying always to rely on the short - term contracts without relying on the benefits of the long - term contracts , the marketers believe that this kind of contracts is a guarantee way of continuing in marketing and in the level of prices that they accept.

The trade of raw materials between the Arab states is in it's lowest volume and it is disorganized and random and it is not done on the correct way of business . This is why when a needed Arab consumers needs a certain amount of raw materials and is ready to pay the asking price , he may not treated by the preferred customer (We found this in the process of trade exchange between Arab countries , for example, lead concentrates), As well as the exchange of information of the secrets of some data of the international markets for raw mineral seem non-existent between the Arab producers and I belief that any two Arab states or more producing the same raw will compete with each other and it is considered unacceptable, and on the contrary , the cooperation between these countries in the exchange of information and follow the strategies agreed marketing will benefit everyone.

Finally, I can say that the field of Mineral extraction In the Arab world still a virgin filed , and the marketing of this mineral ores and products Between these countries or between them all and the foreign countries are still virgin as well, whoever can study the factors that affects these fields will gain a lot of income and will give a great benefit to these countries and his organization as well.

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