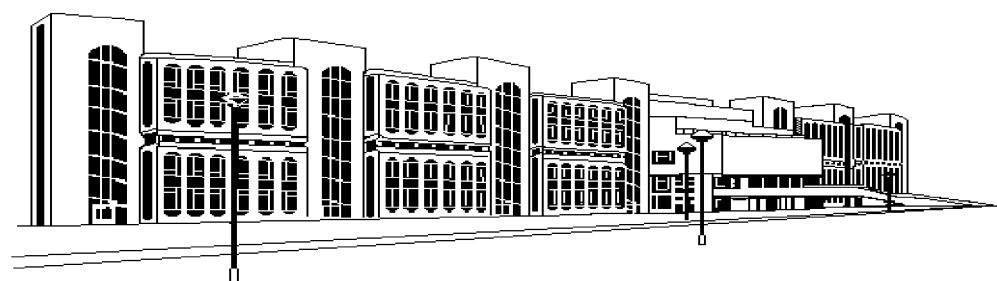




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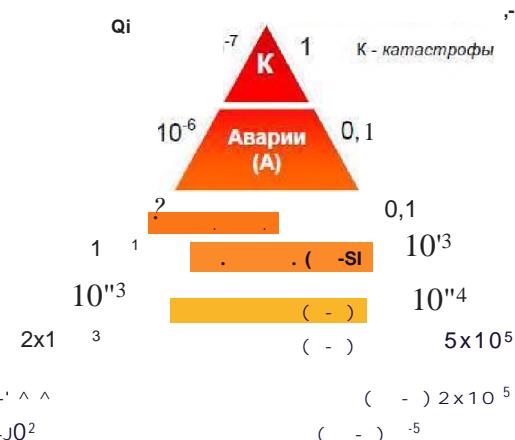
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 :  
 -  $Q_{KC} < 10^{-7}$ ;  
 -  $Q_{AC} < 10^{-6}$ ;  
 -  $Q_{CC} < 10^{-4}$ ;  
 -  $Q_{yy_n} < 10^{-3}$ .

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 Q; ( . 1).  
 ( 10<sup>7</sup> ),  
 =  $Q_j Q_t$ ,  $i = 2, 3, \dots, 8$ .  
 $r_i$  ( . 1).  
 , ( . 1).  
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$i$		$-$ $, Q_i <$	$, r_i$
<b>1</b>	( )	<b>10<sup>-7</sup></b>	<b>1</b>
<b>2</b>	( )	<b>10<sup>-6</sup></b>	<b>0,1</b>
<b>3</b>	( - )	<b>10<sup>-6</sup></b>	<b>0,1</b>
<b>4</b>	( - )	<b>10<sup>-4</sup></b>	<b>10<sup>-3</sup></b>
<b>5</b>	( - )	<b>10<sup>-3</sup></b>	<b>10<sup>-4</sup></b>
<b>6</b>	( - )	<b>2 10<sup>-3</sup></b>	<b>5 10<sup>-5</sup></b>
<b>7</b>	( - )	<b>5 10<sup>-3</sup></b>	<b>2 10<sup>-5</sup></b>
<b>8</b>	( - )	<b>2</b>	<b>10<sup>-5</sup></b>



. 1. ,

$$R = {}^{TM} q, \sim "JT, R_{|=I} \in \mathcal{L} R, \quad (3)$$

$$-^R \sim Z_{initial} \quad (4)$$

$$\begin{aligned} R &= \dots \\ &\vdots \dots \\ i &= \dots \\ &\vdots R = \dots \end{aligned}$$

. 2.

2

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		< 10 <sup>-7</sup>	>10 <sup>-6</sup> < 10 <sup>-6</sup>	>10 <sup>-6</sup> < 10 <sup>-4</sup>	>10 <sup>-4</sup> < 10 <sup>-3</sup>	>10 <sup>-3</sup> < 2 10 <sup>-3</sup>	> 2 10 <sup>-3</sup> < 5 10 <sup>-2</sup>	>5 10 <sup>-2</sup> < 10 <sup>-1</sup>	>10 <sup>-1</sup>
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$$Qz = I KnJT. \quad (5)$$

(4) (5), \quad k\_\ell = r\_i

$$q_i(T) \\ q_i \sim njT, \quad : \quad ,$$

$$qi^{(1_X)} = n_{i,l} L_z; \quad (6)$$

$$4, (Nn \ f^{sn_i} l^N n; \quad \quad \quad (7)$$

$$qi^{(N)} \rightarrow sB n_i^{(N)}_{nacc}. \quad (8)$$

1. . Doc 9859AN/474. - 2- . , 2009.  
2. Airbus Flight Profile Specification, 2004.  
3.  
4. : 01.06.98, 609.  
4. . . ( ). - .. , 2008.

## METHODICAL APPROACH TO RISK ASSESSMENT IN SAFETY MANAGEMENT SYSTEM

Zubkov B.V., Prozorov S.E

The article presents review of a methodical approach to systematize the original data in assessing the risk to SMS airlines, based on the standard classification of adverse events, existing norms of the probabilities for specific situations in flight and the correlation of statistical estimates of their frequency of occurrence between classes.

Key words: flight safety, level of risk, classification of adverse events, specific situations in-flight, category and precursors of incidents

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« » :  $Pj$  - ;  $i$ ,  $j$  -

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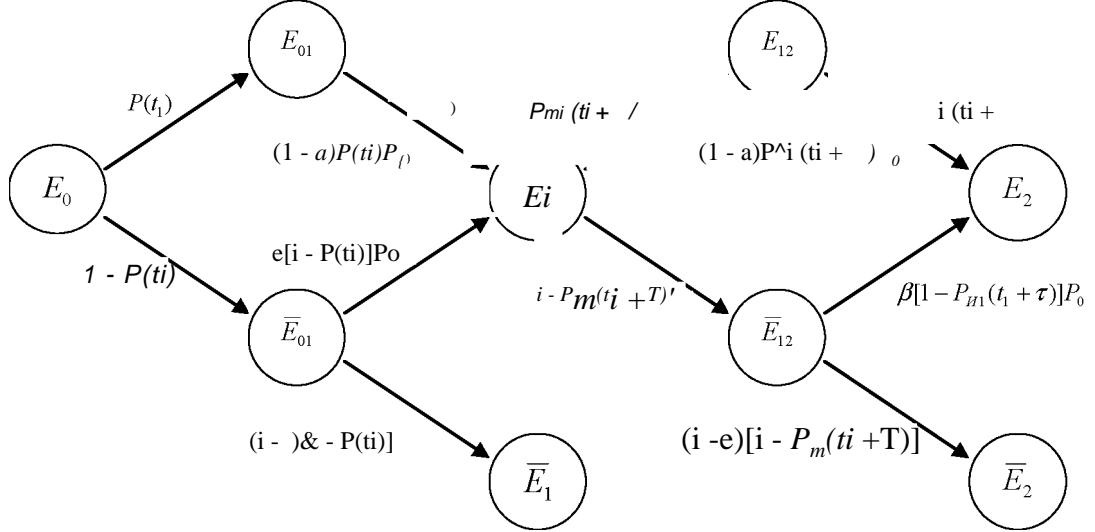
;  $(I)$  - ;  $I$ - ; - ( II- ). ;  $(I)$  -

, ,  $t_1$  (  $t_1$  ).

$P(t_1)$   $t_1$  (  $t_1$  ).  $1 - P(j)$   $t_1$  (  $t_1$  ).

01 01  $t_1$   $t_1$  ).

. 1.  $t_1$   $t_1$  ).



. 1.

$$P_H i = a * P(ti) + (i - ) * P(ti) * Po + * [i - P(0)] * Po. \quad (1)$$

$$(i) \quad P(t_i) \quad P_i$$

$$P = e^{- \int x(t) dt}$$

(i)

$$P_{h,i} = a * P_i + (i - a) * P_i * Po + * [i - P(t_i)] * Po. \quad (2)$$

$$P_o = i, \quad a = i - (2) \quad (i), \quad ,$$

$$P_h i = i.$$

$$t = t_i + .$$

$$P_{h,1} = a * P(t_i + ) + (i - - ) * P(t_i + ) * P + * P_o(t). \quad (3)$$

$$P_o(t) = ( ).$$

$$P_{h,i}(t) = * P(t) + (i - - ) * P(t) * P + * P(t). \quad (4)$$

$$A(t) = = const.$$

$$P = e. P(t) = e^{A(t)}.$$

$$P_i = ( ), \quad (4), \quad ,$$

$$P_h i(t) = (i - ) * e^A + * e^A. \quad (5)$$

Prn(t)

p=i

$$\mathbb{P}_h \bar{\mathbf{1}} \stackrel{\cong}{\rightarrow} \mathbb{E}^t. \quad (6)$$

$$t = i * t + .$$

(4).

$$P_i = e^{- \int x(t) dt} \quad e^{- \int x(t) dt} * e^{- \int M_j(t) dt} \quad P * e^{\int x(t) dt} \quad (7)$$

$$e^{\int_{t_0}^t J_z(t) dt} = R(t), j = 0; k \quad (8)$$

$$e^{\int_{t_0}^t J_z(t) dt} = P_i, i = 1; k.$$

(4)

$$P_m(t) = a * P.R.(r) + (1 - a) * P * \mathbf{PM} + * R, \mathbf{M} \quad (9)$$

$$P_{,,}(t) = \ll 11 * \mathbf{PM} + \ll 10 * \mathbf{PM} + e * \mathbf{PM}, \quad (10)$$

$$\begin{aligned} & Ro(\mathbf{T}) = P(\mathbf{T}) = e^{-\int_{t_0}^t J_X(t) dt} \\ & (t = t_1; t = 2t_1) \\ & (t = 1; t = 2t_1) \end{aligned}$$

$$P_2(t) = a * P_m 1(2t_1 + ) + (1 - a) * P_m 1(2t_1) * P(T) + * [1 - P_m 1(2t_1)] * P(T). \quad (11)$$

$$(11) \quad (4) \quad (8),$$

$$\begin{aligned} & \mathbf{P}_2(t) = a * \mathbf{P}_2 * R_2(T) + a * \mathbf{P}_{[(1 - a) * P + ]} * R_1(T) + \\ & (1 - a) * a * p + \mathbf{P}_{[(1 - a) * P + ]} * + * \mathbf{PM} \end{aligned} \quad (12)$$

$$P_m 2(t) = \ll 22 * R_2(T) + \ll 21 * R_1(T) + \ll 20 * Ro(T) + * Ro(T). \quad (13)$$

$$\ll 22 = a * \ll 11 * \frac{P}{P}; \ll 21 = a * \ll 10 + ; \ll 20 = \frac{1 - a}{a} (\ll 22 + \ll 21). \quad (14)$$

$$\begin{aligned} & t = 3t_1 + \\ & P_M 3(t) = \ll 33 * R_3(T) + \ll 32 * R_2(t) + \ll 31 * R_1(T) + \ll 30 * R_0(T) + * R_0(t) \end{aligned} \quad (15)$$

$$\ll a * \ll 22 * \frac{P}{P}; \ll 32 = a * \ll 21 * \frac{P}{P}; \ll 31 = a * P_1 (\ll 20 + ); \ll \frac{1 - a}{a} (\ll 33 + \ll 32 + \ll 31). \quad (16)$$

$$\begin{aligned} & k- \\ & t = k * t_1 + \\ & P_m(t) \end{aligned} \quad (17)$$

$$P_M k(t) = \ll k * R_k(T) + \ll k(k-1) * R_{k-1}(t) + \ll k(k-2) * R_{k-2}(t) + \dots + \ll k(k-j) * R_{k-j}(t) + \dots \quad (17)$$

$$+ \ll k1 * R_1(T) + \ll k0 * R_0(T) + * R_0(T)$$

$$\ll k(k-j)$$

$$\ll k = a * \ll (k-1)(k-1) \frac{P}{P} * P, \quad (18)$$

$$a_{k(k-1)} \quad {}^a(k-1)(k-2) \stackrel{*}{\underset{r_k - 2}{\overset{P-1}{\longrightarrow}}} \\ a_k(k-2) = {}^a * {}^a(k-1)(k-3) \stackrel{*}{\underset{P_{k-3}}{\longrightarrow}} \\ a_{k(k-j)} \quad {}^{a*} a_{(k-1)(k-j-1)} \stackrel{*}{\underset{r_{k-j-1}}{\overset{P}{\longrightarrow}}} \bullet \quad (19)$$

$$\begin{aligned}
 & \text{a}kI = a^* p(a(k-1)0 + \dots). \\
 & \begin{array}{c} I-a \\ a \\ a \\ H=I \end{array} \quad \begin{array}{c} .=k \\ z \\ a \\ kn \end{array} \\
 (17) \quad , \quad & - \int a(t) dt \\
 & I = * e^0 \quad . \\
 nst & , \\
 A. & , \\
 (5).
 \end{aligned}$$

$$A = \text{const} \quad , \quad \text{A.} \quad , \quad (5).$$

$$P_m(t) = \frac{"(1 - )^k * P^k + (1 - )^{k-1} * P_{I^{k-1}} + \dots + *(1 - )^{k-1} * P +"}{... + (1 - ) * \mathbf{P}_+} : R_O(T). \quad (20)$$

$$(20) \quad P_{mk}(t) = [(1 - \tau)^k * P + (1 + \tau + \tau^2 + \dots + \tau^{k-1})] * R_0(\tau).$$

$$\sum_{k=1}^n \frac{a_k}{1-a_k}$$

$$P_{mk}(t) = \frac{(1 - (1 - \rho)^k) * P_0}{1 - (1 - \rho)^k} \quad (21)$$

$$R_0(\cdot) = e^{-At}$$

$\wedge$  ( )  $k$  .

$$\text{,,}^{(t)} \quad 1 - (1 - )^* \mathbf{P} \quad (22)$$

$$\equiv t_1$$

$$P = \frac{^*P}{1 - (1 - )^*P} \quad (23)$$

$$r_{error} = \frac{1}{1 - (1 - r)^* P}. \quad (24)$$

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» [4].

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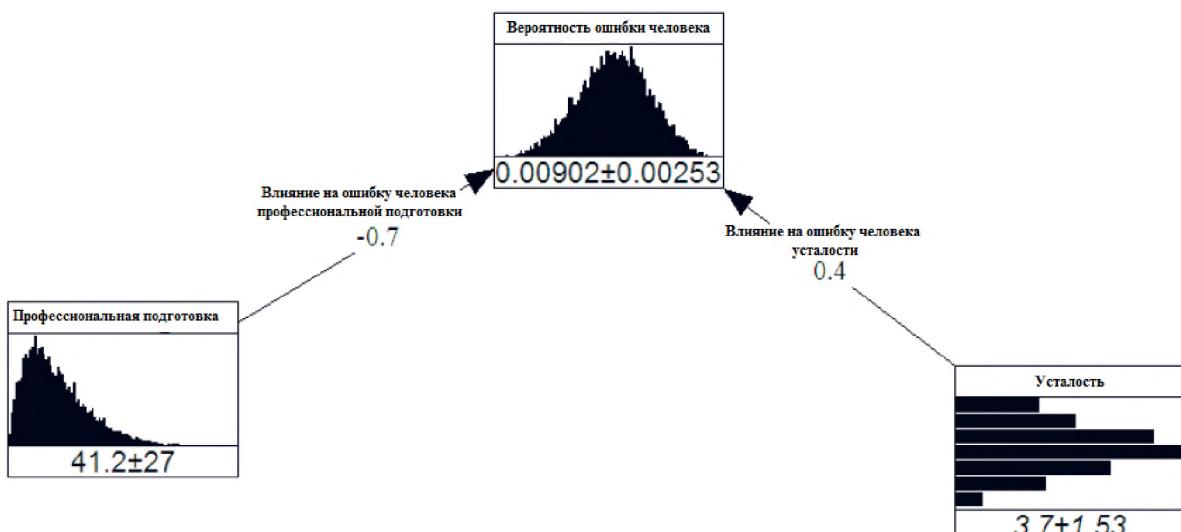


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[4]

$$P_{ro} = HEP * \sum_{i=1}^N PSF_i * W_i, \quad (25)$$

HEP - ; PSF<sub>i</sub> - ; W<sub>i</sub> - ; ; i-  
(Shaping Factor)

1. . . . . FMEA-FTA -
- //
2. . . . . ( ). Doc 9859-AN/460. - 2- . - , 2009.
3. . . . . // , . - 2009. - 149.
4. Causal Model for Air Transport Safety/Final report. 2009.

## **PROBABILITY ESTIMATION OF THE HUMAN ERROR AT AIRCRAFT MAINTENANCE**

Zubkov B.V., Makarov V.P.

This article is devoted the mathematical model not detection of fault or malfunction of the aircraft at maintenance.

Key words: hazard, error, probability.

, 1940 . ., (1966),  
 , 140 , ,  
 , 1987 . ., (2009),  
 << - >>, 4 ,  
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347.822.4

## FMEA-FTA

1.

FTA-FMEA

(FMEA) « , FMEA [2, 4] » (FTA).

« , FTA [2] »,

FTA FMEA. FTA

« , »,

FTA-FMEA « » ( ).

2.

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, (accident) (incident)  
[10, 11]. [5, 7]

, (hazards) - [6].

, ( ).

, ARMS (EASA)

[7].

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[\( http://www.skybrary.aero/ \),](http://www.skybrary.aero/)

( . . 1).

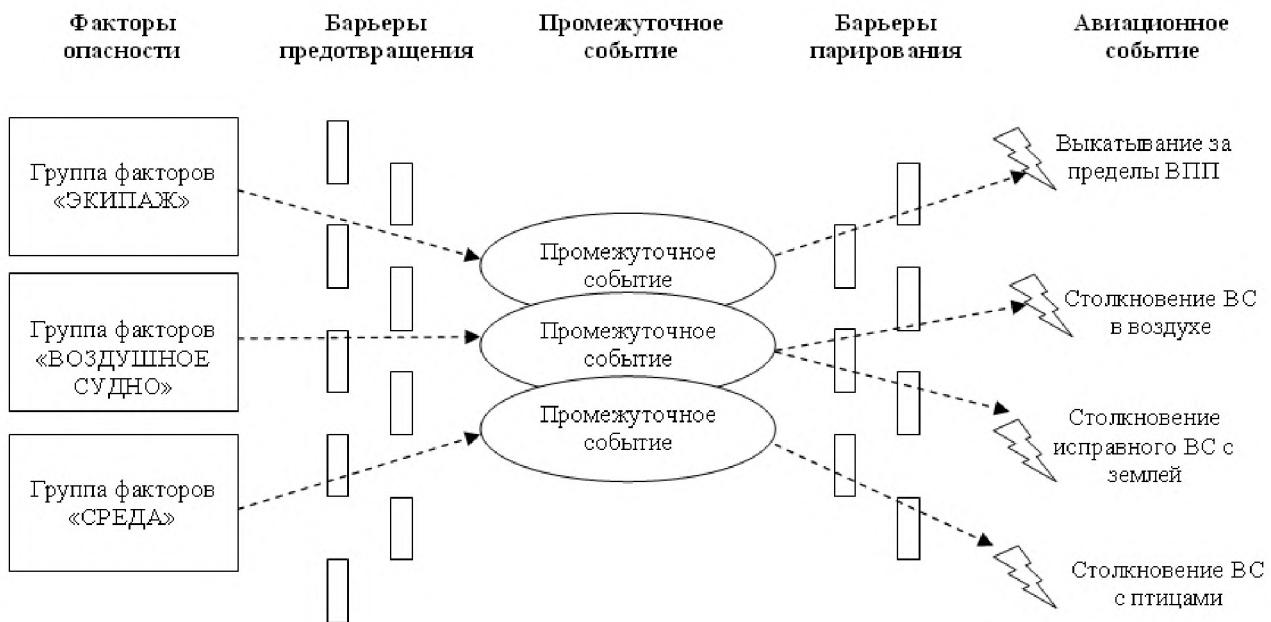


Рис. 1. Принципиальная схема развития авиационного события

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( . . )

( . . [5]).

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( . . ) , ,

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 ( 0 4 30 (100 ));  
 ( 5 8 30 (100 ));  
 ( 9 12 30 (100 ));  
 ( 12 30 (100 ));

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[10] ( ) [9].  
 [10] [11].

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1	2	3
1	ARN	ABNORMAL RUNWAY CONTACT
2	BIRD	BIRD
3	CFIT	CONTROLLED FLIGHT INTO OR TOWARD TERRAIN
4	FIRE	FIRE
5	GCOL	GROUND COLLISION
6	LOC-I	LOSS OF CONTROL - INFLIGHT
7	MAC	AIRPROX/ ACAS ALERT/ LOSS OF SEPARATION/ NEAR MIDAIR COLLISIONS/ MIDAIR COLLISIONS
8	RE	RUNWAY EXCURSION
9	SEC	SECURITY RELATED
10	CTOL	COLLISION WITH OBSTACLES DURING TAKE-OFF AND LANDING
11	DECOM	DECOMPRESSION
12	ADES-I	AIRFRAME DESTRUCTION - INFLIGHT

FTA

( )

[3].

FMEA-FTA

FMEA -

FTA -



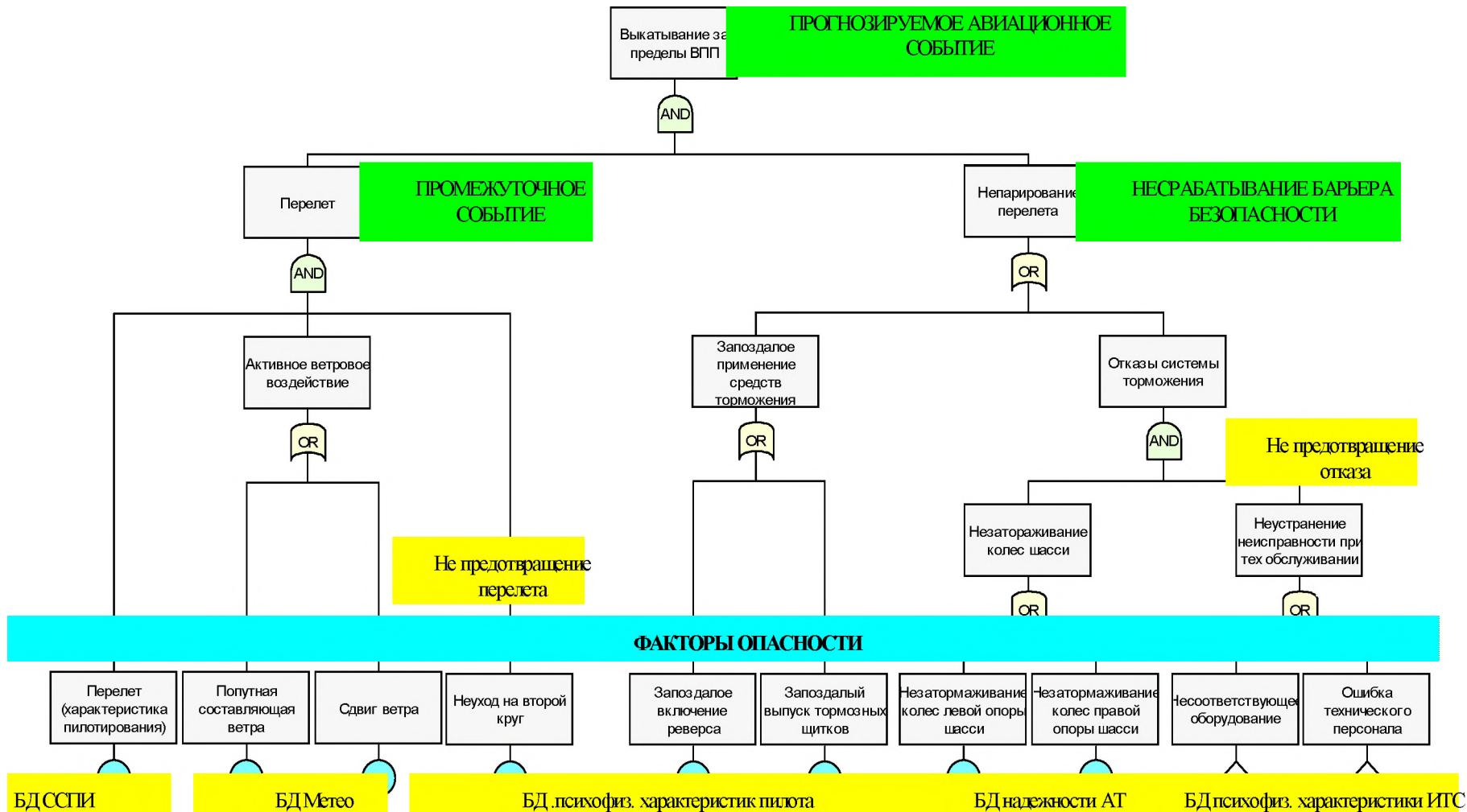
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	)	-
0		,

[4],  
,

» (*Hierarchical Interaction Matrix* [1]).

218.



1. Bluvband Z Bouncing failure analysis (BFA): the unified FTA-FMEA methodology / Z.Bluvband, R.Polak, P.Grabov // Reliability and Maintainability Symposium. Proceedings. Annual. - 2005. P. 463-467.
2. «Potential Failure Mode and Effects Analysis (FMEA)», QS-9000 Reference Manual, 1995.
3. 51901.13-2005 «».
4. . . . .
5. . . . . ( ) Doc 9859-AN/460. - 2- . . , 2009.
6. . . . . » ( -25). - .
- 2004. - . 25.
7. . . . . , 2010.
8. ICAO Doc9817. . . . . 2005.
9. . . . . ( ) . - . . . .
- , 2002.
10. Aviation Occurrence Categories. Definitions and Usage Notes. / CAST/ICAO Common Taxonomy Team (CICTT) / October 2008 (4.1.4).
11. ICAO ADREP 2000 taxonomy, 2006 .
12. . . . . , 2011. - . 2.
13. . . . . : «» , 2010.

## **THE METODOLOGY OF UNIFIED FTA-FMEA METHOD FOR AVIATION ACCIDENT RISK ASSESSMENT**

Sharov V.D., Makarov V.P.

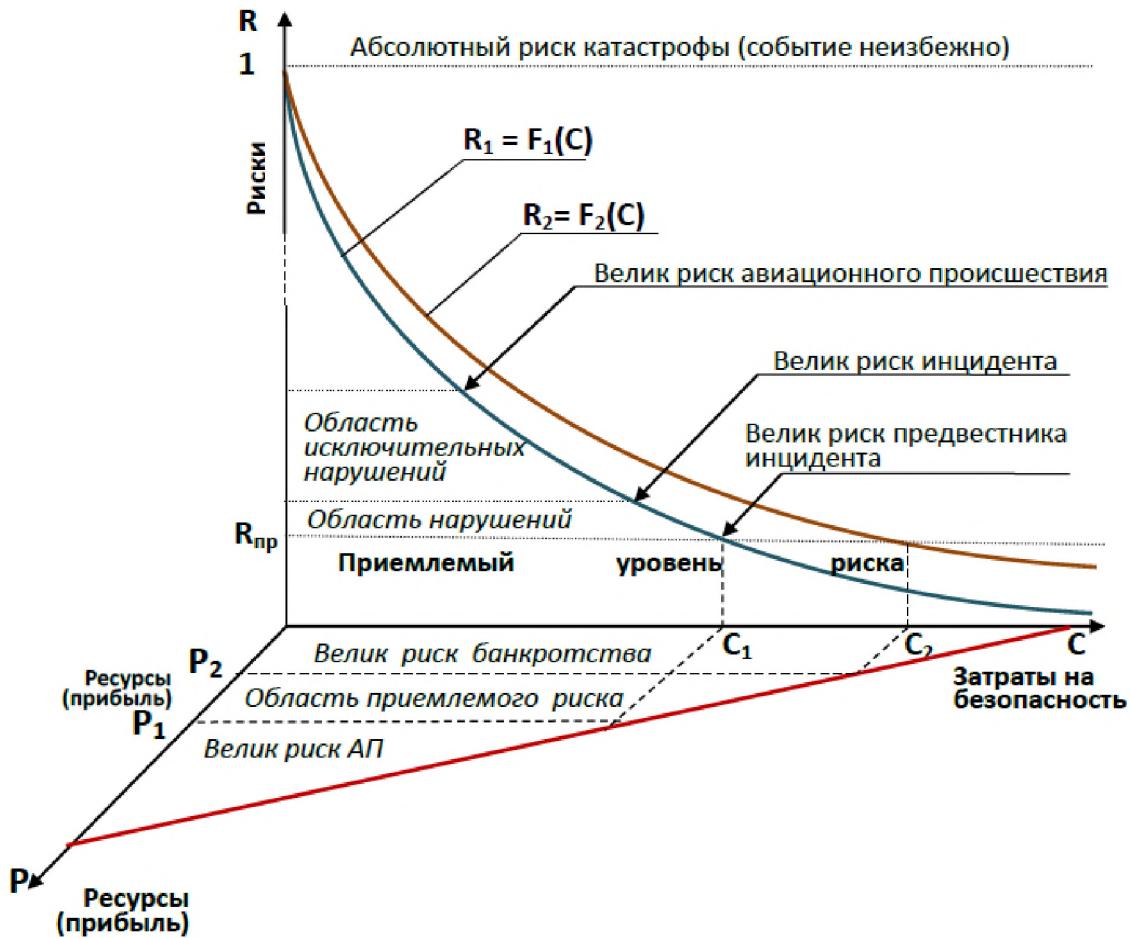
This article is devoted to research of possibility of using an innovative combination of two traditional failure analysis techniques: FMEA and FTA in airline safety risk analysis.

Key words: aviation incident/accident, hazard, risk assessment.

- , 1955 . ., (1977), . . . . .
- 50 , . . . . . , 1987 . ., (2009), . . . . .
- « . . . . . » , 4 . . . . .
- . . . . . , . . . . .

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$$R = 0.$$



$R_1$  ( )

$R_2$  ( )

$R_2$  ( ).

$$P = F(\cdot),$$

$$P \equiv -\partial_t - , \quad \partial_x -$$

2

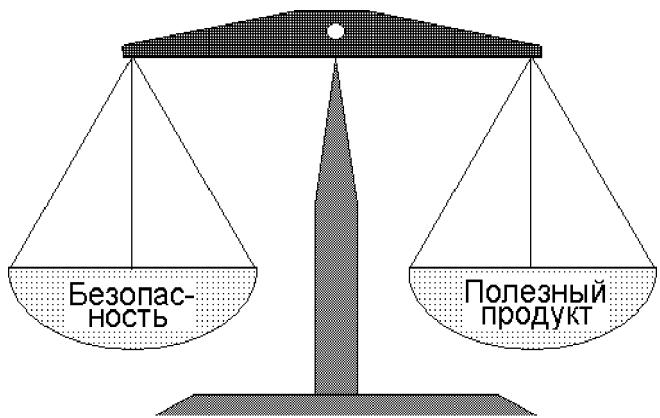
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$$R_2 = F_2(C)$$



**Рис. 2.** Баланс интересов

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1. ( LOSA),  
, 2002.  
2. . Doc 9859AN/474. - 2- . , 2009.

## **SAFETY AND ECONOMY**

Prozorov S.E.

The article presents review of financial terms of flight safety as the state of an acceptable level of risk.

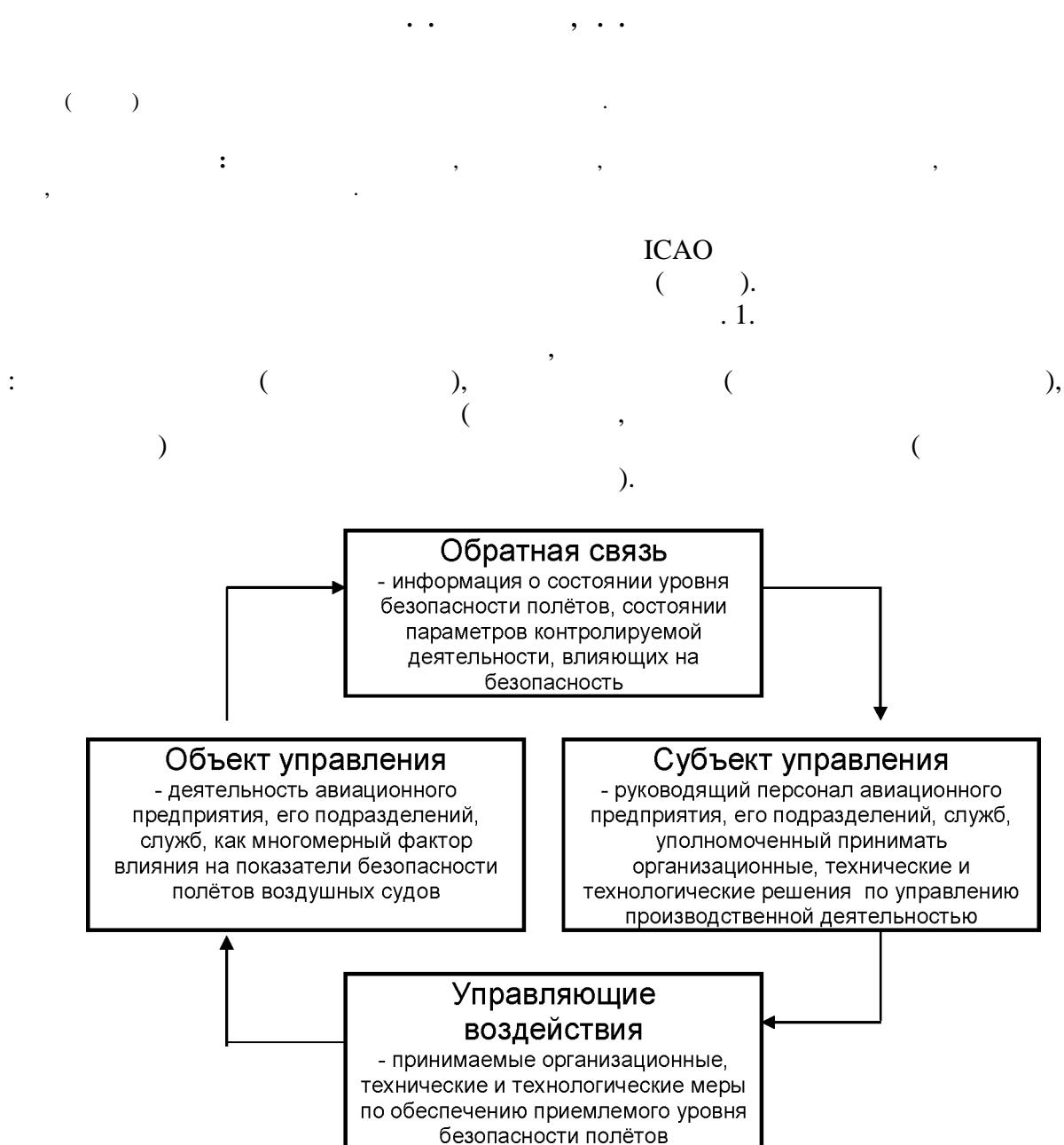
Key words: flight safety, financial expenses, conflict of interest.

, 1941 . .

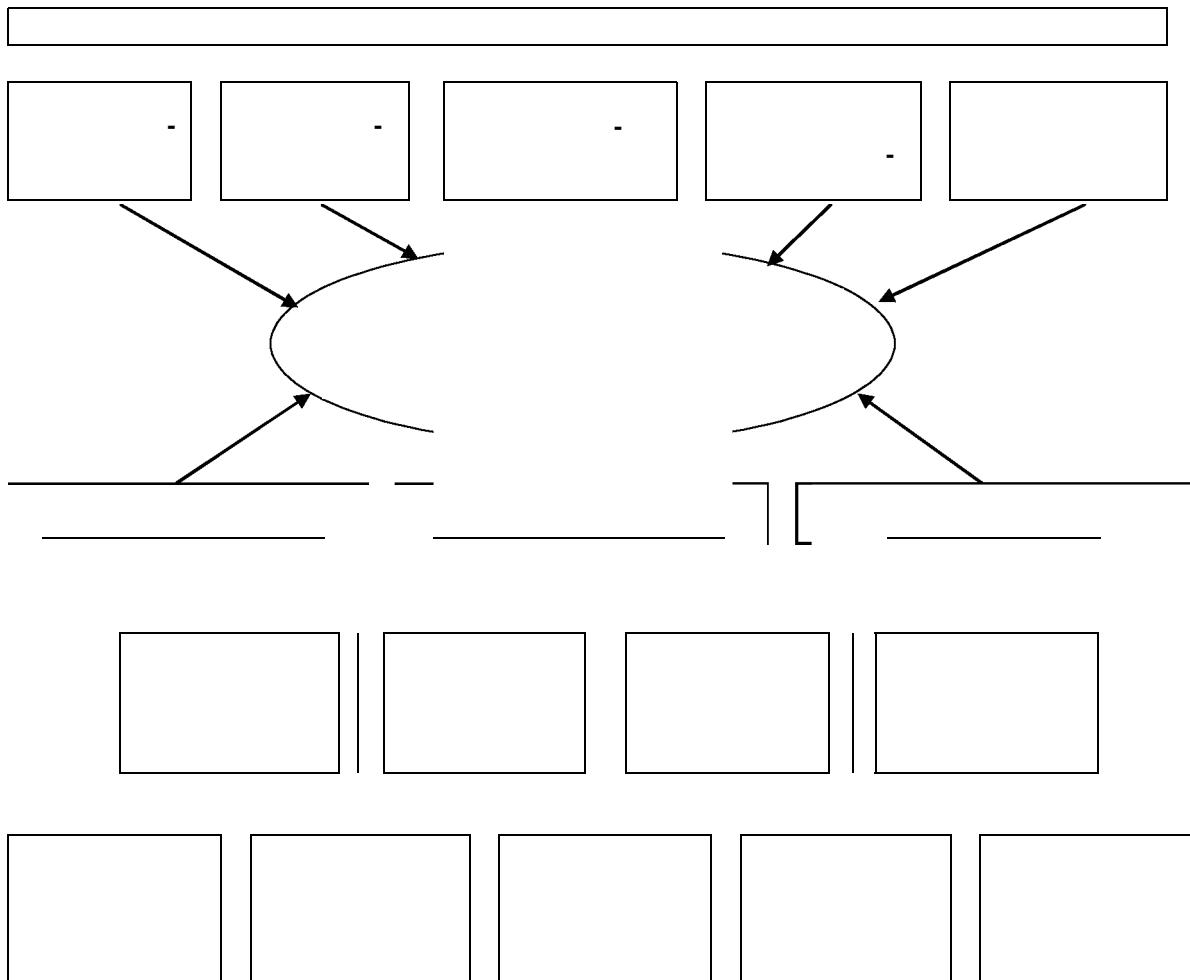
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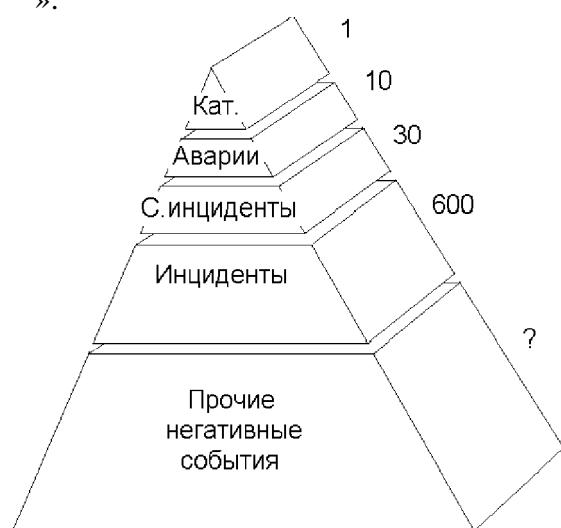
LOSA, ).

ICAO

<sup>2</sup> See also the discussion of the relationship between the two concepts in the section on "The Concept of the State."

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« 1:10:30:600» [65] ( . 3),  
», «





1. . Doc 9859AN/474. - 2- . , 2009.  
 2. : 6 2008 ., 641- .  
 3. 10, 33, 47 ( 2 2009 , 19.11.09, 18.11.10).  
 4. . ( ) . - .: . ,  
 2008.

## **DATAWARE FOR SMS**

Prozorov S.E., Enikeev R.V.

The article presents review of the main sources of information to ensure safety management system (SMS) work of airlines and features of their usage.

Key words: flight safety, SMS chart, types and sources of information, voluntary reporting, pyramid of adverse events.

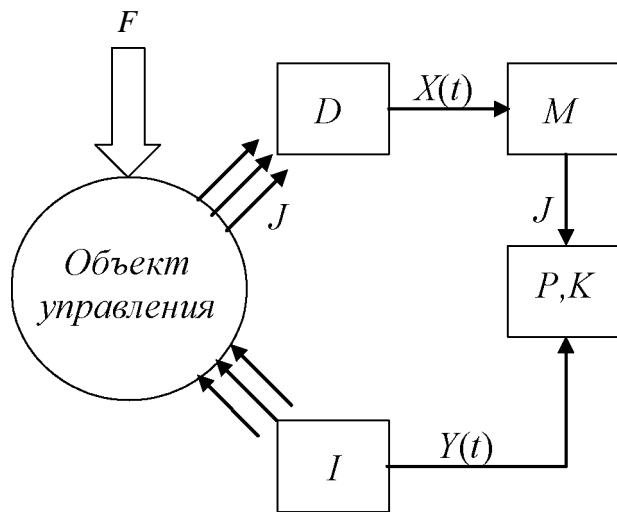
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$$q_i = 1 - m^M,$$

i-

$$= (1 - Y^M).$$

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- 2008. - 142.

2.

II

, 1999.

## TO THE QUESTION OF THE RELIABILITY OF THE HUMAN OPERATOR IN THE CONTROL SYSTEM OF AVIATION PERSONNEL

Eliseev B.P., Marienkin E.V.

In this paper, we consider the reliability of specialist civil aviation as one and parameters, analyzed in the system of management of aviation personnel.

Key words: reliability, system management, aviation personnel factors.

(1980),

, 1957 . . ,

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100

, 1976 . . ,

(1999),

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656.7:658

[1]

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[5]

[2]. Z,

$$Y(r) \text{ - } r_{opt} = \arg \min Z(\ ) = \operatorname{argmin}[X(\ ) + Y(\ )]. \quad (1)$$

 $f_t Opt$ 

[5].

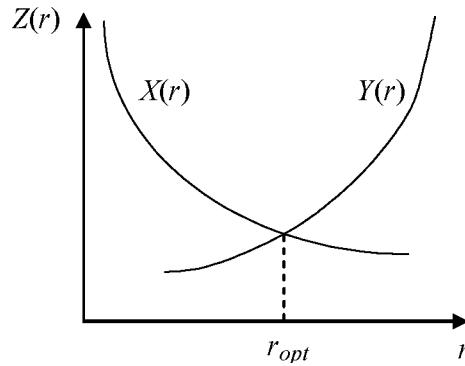
(1).

. 1

$Y$ 

[3]

$$Y(r) = \dots, \quad (2)$$



1.  $r_Q p_t$   
 $\therefore = 10-10^3$  ( $r=2 \times 10^{-4}$ ).  
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»  
 « , . . . » ,  
 ,  $Y(r) \quad (1)$   
 $Y(r) = ( \quad + \quad )r$ . (3)

1. [5],  
 2. [5].  
 3.  
 4.  
 5.  $10^{-9}$ ,

6. , , , , ,  
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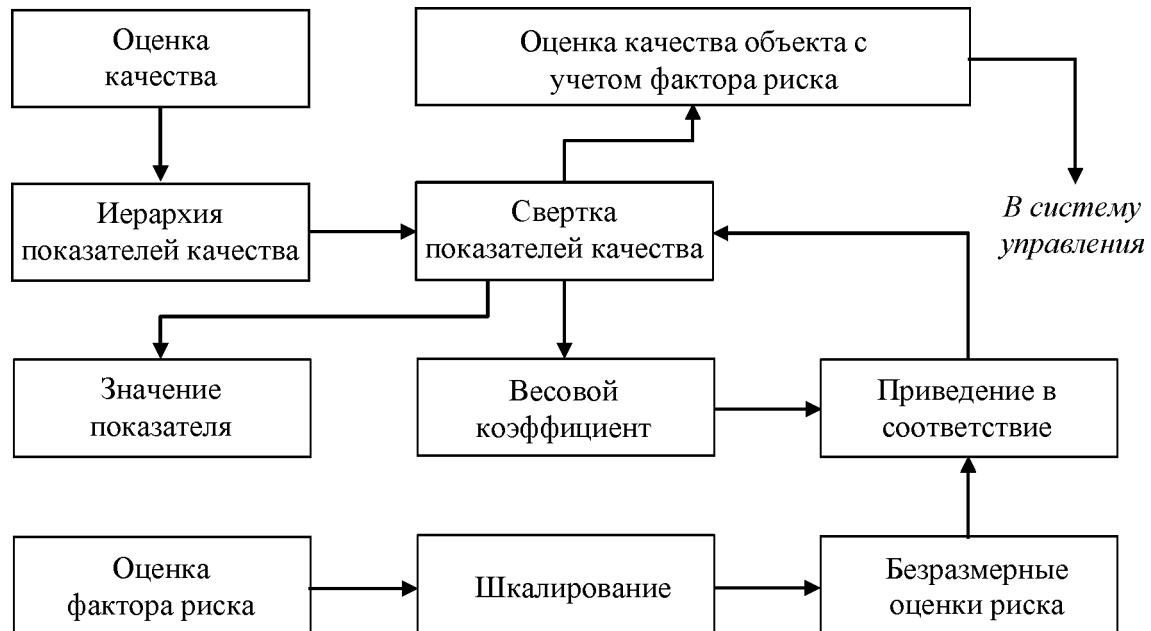
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## **SOME OF THE COMMENTS ABOUT THE CONCEPT OF RISK IN CONNECTION WITH THE MANAGEMENT OF AVIATION PERSONNEL**

Eliseev B.P., Marienkin E.V.

The paper examines the concept of risk, with respect to the safety of air transport and the methods of its assessment with a view to use in the management of aviation personnel.

Key words: aviation personnel, the risk of damage, flight safety.

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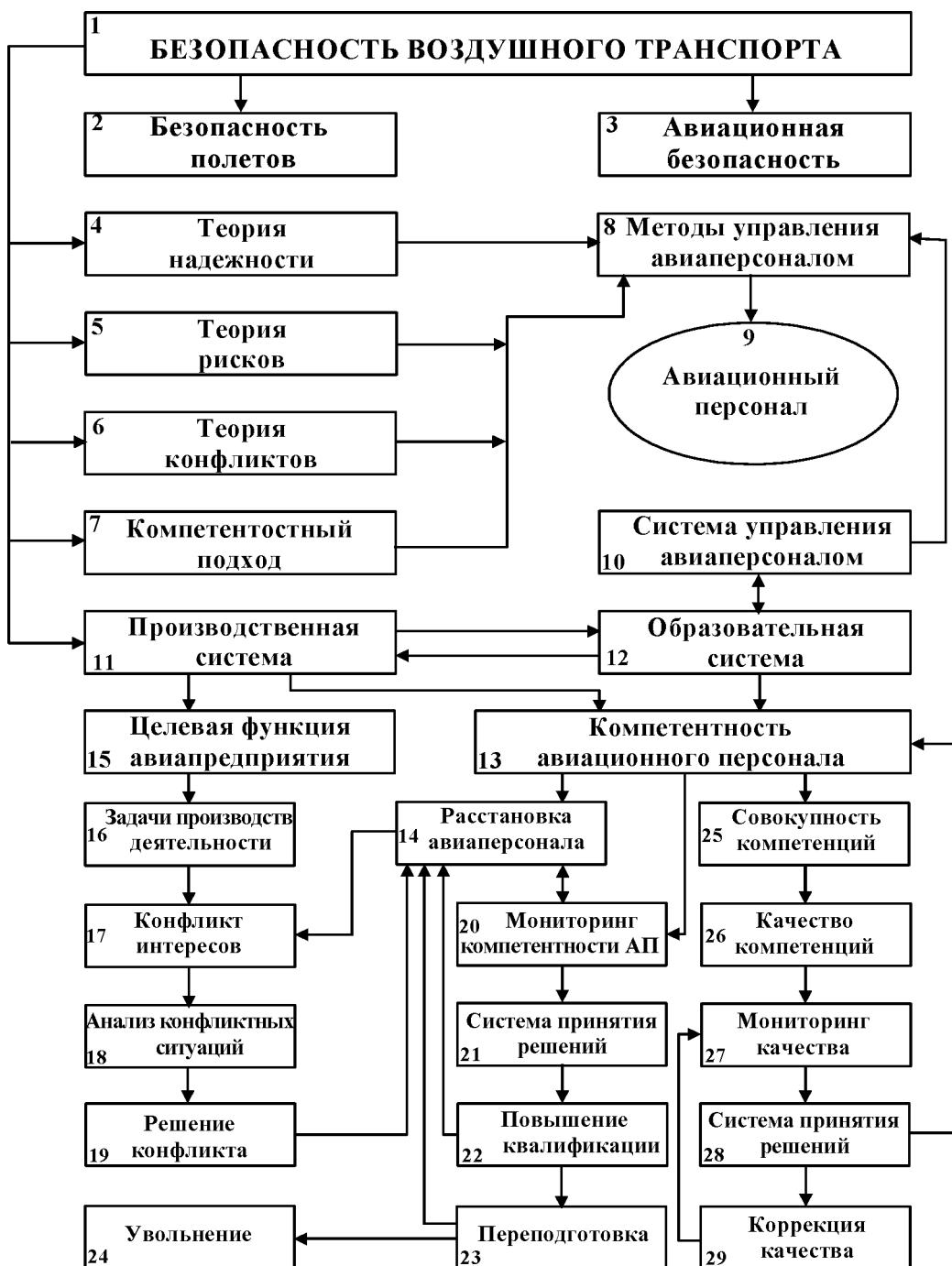
1. (1), (2)  
      (3)

2. , 90% (9).

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$$(10) \quad (12). \quad : \quad (11)$$



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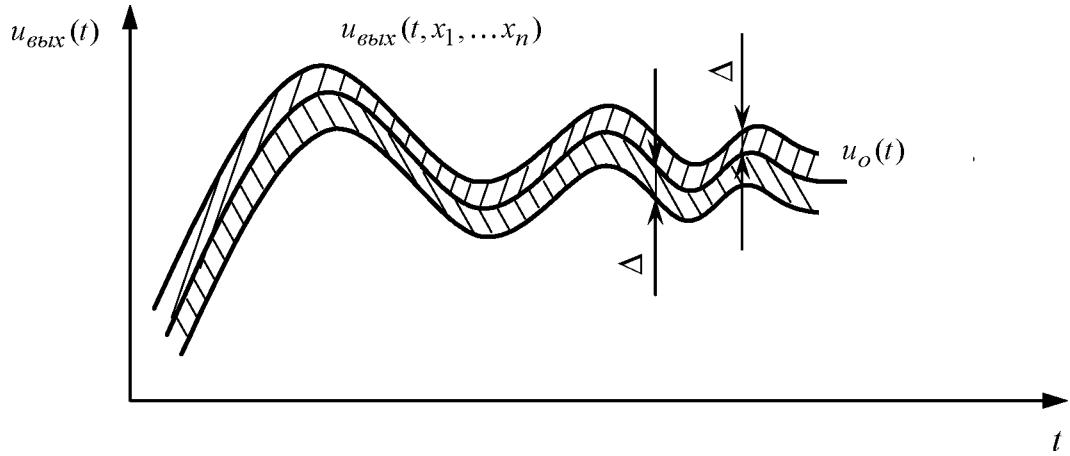
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$$W(\dots \wedge \dots) = \{ \dots (t) \mid \forall Ax \exists k A x, \dots_0(t) \}.$$

$$w(\dots \wedge \dots, \dots) = w(\dots, \dots).$$

$$\begin{aligned} f dW) & \quad f dW) & \quad f dW \\ , \quad Ax, & \quad J_{\neg Ax}, & \quad \neg J_{Ax}, = 0 \\ & \quad 0, \text{Sign} & \quad f dW \\ & \quad -\text{Sign} & \quad f dW \\ & \quad ,^j Ax, > 0 & \quad ,^j Ax, < 0 \end{aligned}$$

$$\begin{aligned} f d^2W \wedge & \quad f dW \\ ,^j Ax, & \quad dAx_i J_{\neg Ax}, \\ & \quad ; \text{Sign} & \quad f d^2W \wedge \\ & \quad dAx_i J_{\neg Ax}, & \quad = \text{Sign} f d^2W \wedge \\ & \quad ,^j Ax, > 0 & \quad ,^j Ax, < 0 \end{aligned}$$

$$\begin{aligned} f dW \wedge & \quad 0; f dW \wedge \\ ,^j Ax, & \quad V dAx_j JVx, \\ & \quad > 0. \end{aligned}$$

$$\begin{aligned} f W \wedge & \quad f W \wedge \\ ,^3 j, > 0 & \quad ,^j, < 0 \\ & \quad ; \text{Sign} & \quad f W \wedge \\ & \quad ,^3 j, > 0 & \quad : -\text{Sign} f W \wedge \\ & \quad ,^3 j, < 0 & \quad ,^3 j, = 0 \\ & \quad , \end{aligned}$$

$$w(1, \dots, x_j, \dots, x_n) = I^U(t, 1, \dots, x_n) \cup 0(t \wedge <, ),$$

$$U(t, \mathbf{X}1, \dots, x_n) \cup 0(t) = U0(t) + \sum_{i=1}^n \frac{f}{U} \wedge \frac{1}{Ax_i} + \frac{1}{2} \sum_{i,j=1}^n \frac{\mathbf{X} \mathbf{X}_w \bar{i} \bar{j} i j = X_w i X_j}{U} \cup 0(t) =$$

$$\sum_{j=1}^n f U \wedge \frac{1}{Ax_i} + \frac{1}{2} \sum_{j=1}^n \frac{\mathbf{X} \mathbf{X}_w \bar{i} \bar{j} i j = X_w i X_j}{U} \cup 0(t) =$$

$$U \cup 0 > 0, \quad U \cup 0 \cup \cup 0 < A.$$

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,

$$\frac{^2W}{x_i - Xj} = 0, \quad \frac{^nW}{x_i^m - j} = 0$$

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$$\frac{^1}{2!} \frac{I}{i=1} \frac{^2W}{V i J o} \quad \frac{Ax^1 + \frac{n}{4!} I}{x^4} \quad \frac{^4W}{V i J o} \quad \frac{Ax^4 + \frac{n}{6!} f}{i \cdot itl} \quad \frac{^6W}{V i J o} \quad Ax^6 \dots < A.$$

n-

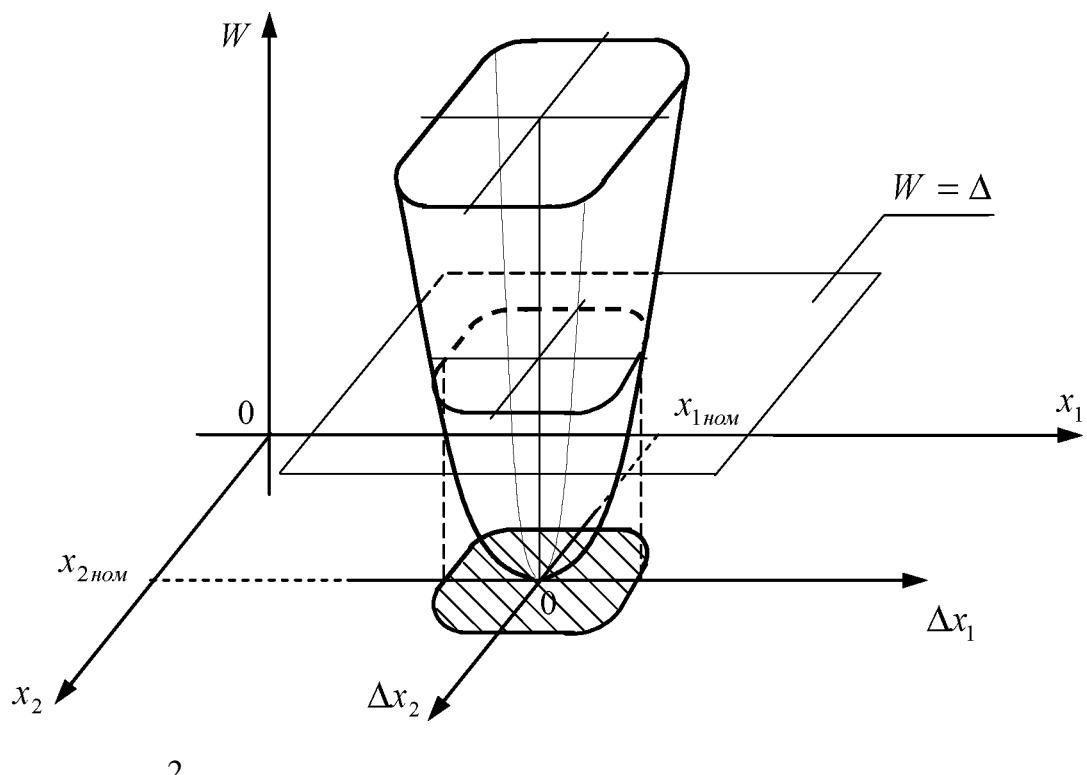
$$W(x_1, \dots, x_i, \dots, x_n).$$

$$\begin{array}{ccccccccc} W & , & W & , & W & , & 0 \\ xi & & x2 & & x_n & & 0 \\ ( & & ) & & & & & \end{array}$$

$^2W$	$^2W$	$^2W$	$^2W$
$x^2$	$xi$	$x2$	$xi$
$2W$	$2W$	$2W$	$2W$
$x^2$	$xi$	$x2^2$	$x2$
$^2W$	$^2W$	$^2W$	$nW$
$x_n$	$xi$	$x_n$	$x_n$
$x_n$	$x2$	$x_n$	$x_n$
$x_n$	$x3$		$x^n$

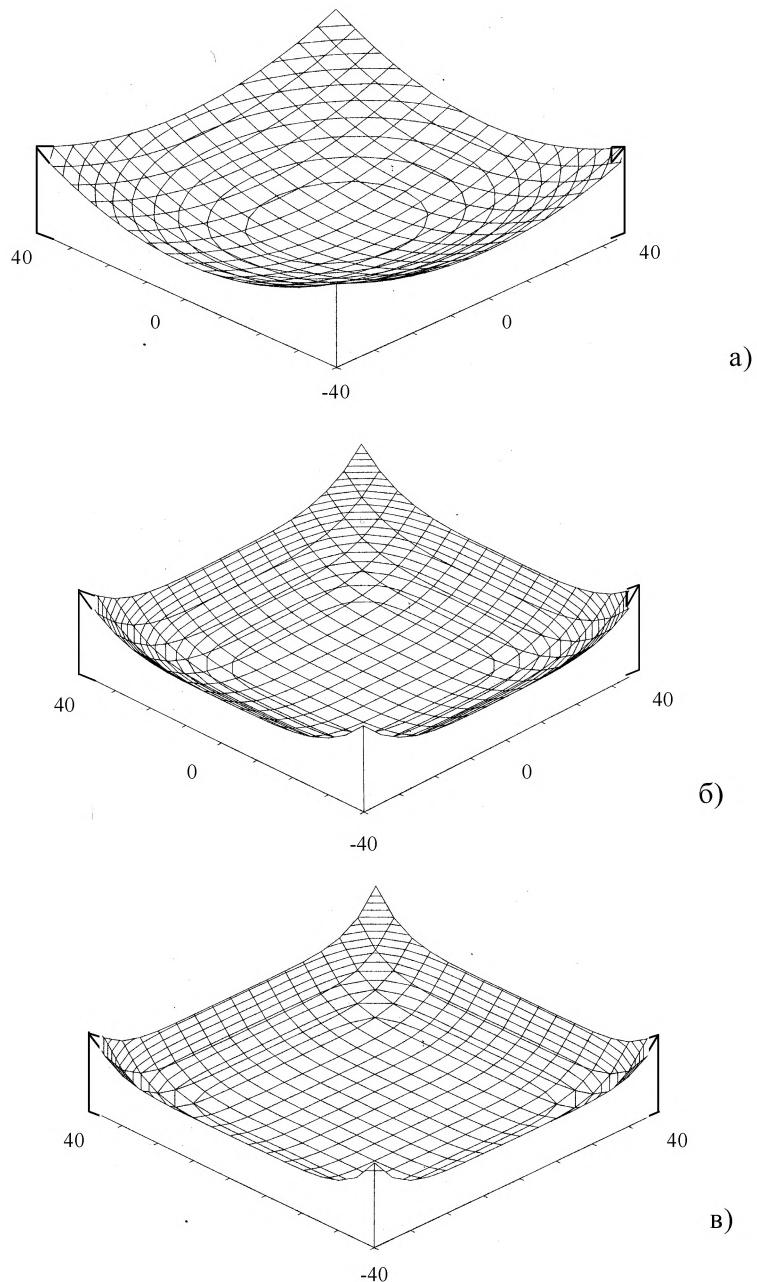
$$\begin{array}{cccc}
 & {}^2\Delta & & \\
 & X? & 0 & 0 \\
 & 0 & {}^2W & 0 \\
 & & x?^2 & 0 \\
 & & & 0 \\
 & & & i=1 \sum {}^2 X_j ?W > 0.
 \end{array}$$

$$\begin{array}{ccccc}
 & 0 & 0 & 0 & {}^n W \\
 & & & & x_1^n J \\
 & & & & . 2.
 \end{array}$$



from Windows, 5.0 ( . 3).

SURFER



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2. A.M. /  
80- : . 17-18 2003 . - .: , 2003.

**STUDY OF CRITERION OF AN AIRBORNE SYSTEM QUALITY ACHIEVING  
MINIMUM DEVIATION OF A REAL SYSTEM TRANSITION PROCESS  
FROM THE TRANSITION PROCESS OF AN IDEAL SYSTEM**

Lebedev A.M.

The aspects of working-out the criterion of an airborne system quality providing minimum deviation of a real system transition process from the transition process of an ideal system are considered.

Key words: board system, quality criterion tube, hypersurface.

, 1947 . ., (1971),  
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$$2 = \overbrace{j \rightarrow J+1}^{(n, \dots, n)} \quad (1)$$

$$X_{\text{min}} < X_{\text{c}} < X_{\text{max}},$$

J m

;

$$Ri = ri \in \mathbf{W}_{\mathbb{Z}}[\mathbf{G}]i \wedge L^n; \dots; R\mathbf{1} \quad \text{Ji} \in \mathbf{n}_m, \quad 5$$

$$\sum_{i=1}^n R_i = 0 \quad \sum_{i=1}^n R_i = R \quad \text{lieu}$$

$$r_i, \ i = 1, n$$

$$I = 1_0 + \frac{d X_i}{r_i} A r_i + \dots + \frac{1}{r_{ni}} A r_{ni}$$

$$x_m - x_{mo} + \frac{m}{V f_m} A \lambda p_h + \dots + \frac{X_m^{\wedge}}{v^n} A r_n$$

$X_i - \bar{X}_i$

$$\begin{aligned} & \wedge V ( \underset{i=i}{\overset{n}{\wedge}} \underset{r_i}{\underset{Z}{\frac{X_i}{\wedge}}} \underset{A^A r_i = A X_i}{1} ) \\ & \underset{i=ni}{\underset{Z}{\frac{\wedge}{\underset{r_i}{\underset{A}{\frac{X_2}{\wedge}}} 1)}} \underset{A r_i = A X_2}{=} \end{aligned}$$

$$\sum_{i=1}^n \frac{1}{V_i} = A$$

$$U = U \quad (\ r_2, \dots, \ ) \quad (1). \\ U \quad (r_1, r_2, \dots, r_n) = \quad (1, 2, \dots, ).$$

$$ri, i = 1,$$

$$U, \quad \underset{0+1}{\underset{i=1}{\text{V}}} \underset{u^i J_q}{\frac{dU}{dr_i - U}} + \underset{i=1}{\text{I}} \underset{u^A i J_q}{\frac{1}{\text{K}_q} \frac{dU}{dr_i} +} \underset{\text{V}}{\underset{r_i J_q}{\frac{dx_i}{dU}}} + \\ + g \underset{=1}{\text{V}} \underset{\underset{d x_i}{\text{J}_q}}{\frac{(dU)}{d r_i}} \underset{\underset{A r_i}{\text{J}_q}}{\dots} + \underset{i=n}{\text{I}} \underset{\underset{d x_i}{\text{V}} \underset{\underset{d}{\text{J}_q}}{\frac{f dU}{d x_i}} \underset{\underset{A r_i}{\text{J}_q}}{\wedge (d x_i \wedge A r_i)}}{\text{V}} \\ , \quad r_i ( \quad ) \\ \text{dU} \underset{r \quad j_0}{=} \underset{j=1}{\text{I}} \underset{\underset{d x_i}{\text{V}} \underset{\underset{d r_i}{\text{J}_q}}{\frac{(dU)}{d x_i}} \underset{\underset{V d r_i}{\text{J}_q}}{\wedge (d x_i \wedge V d r_i)} \underset{\underset{J_q}{\text{J}_q}}{\text{J}_q}}$$

$$\frac{U}{\underset{j=1}{\text{I}} \underset{\underset{d x_i}{\text{V}} \underset{\underset{d r_i}{\text{J}_q}}{\frac{d r_i}{(d x_i \wedge q)}} \underset{\underset{J_q}{\text{J}_q}}{i = const}} \quad (3)$$

$$, \quad u(r_j, \dots, r_n) \quad u(x_j, x_2, \dots, x_m). \\ (3) \\ (dU \wedge \wedge \\ \text{dU}, \quad \underset{\underset{V^d}{\text{V}}} \underset{j}{\text{lrLvc}} \quad i = const \\ \text{V}^d \underset{r_{ij}}{\text{J}_q} \quad (d x_i \wedge q) \quad (4)$$

$$U \quad (1, 2, \dots, ),$$

, . . .

; -

$$\begin{aligned}
 U_{J_0} &= U(X_J) = X_{J_0} \vee r_i J \\
 X_{J_J} &= V^{r_i}_{J_0}(x_i) = i = \text{const} \\
 &= x_i \in J_0 \vee r_i J_0 \\
 &= U(x_i) = X_{J_J} = V^{r_i}_{J_0}(x_i) = i = \text{const.} \\
 &= V^{r_i}_{J_0}(x_i) = i = \text{const.}
 \end{aligned}
 \tag{4}.$$

(2).

$$W(x_1, x_2, \dots, x_n)$$

1. . . . . , 1982.

## **MATHEMATICAL MODEL OF TEST PARAMETERS OF A FLYING VEHICLE AIRBORNE SYSTEMS AND COMPLEXES**

Lebedev A.M.

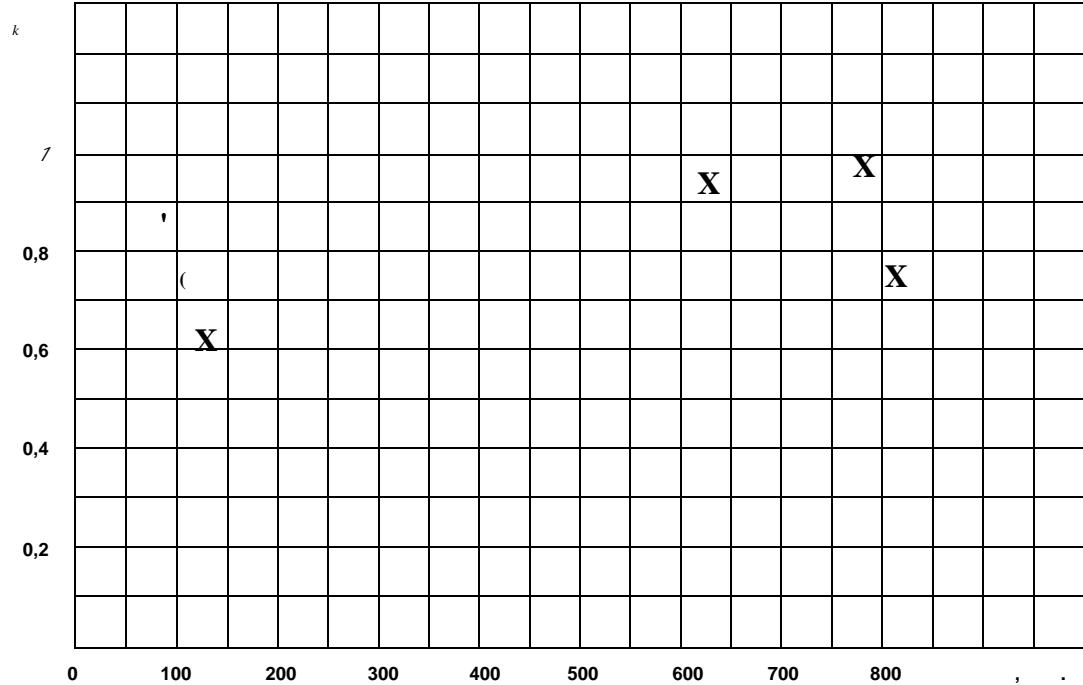
The system of test parameters of a system-under-test is mathematically described in the article.

Key words: mathematical model of the apparatus, system.

, 1947 . ., (1971),  
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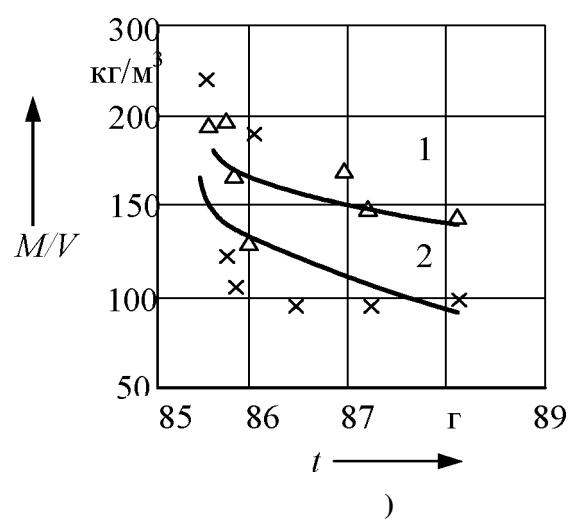
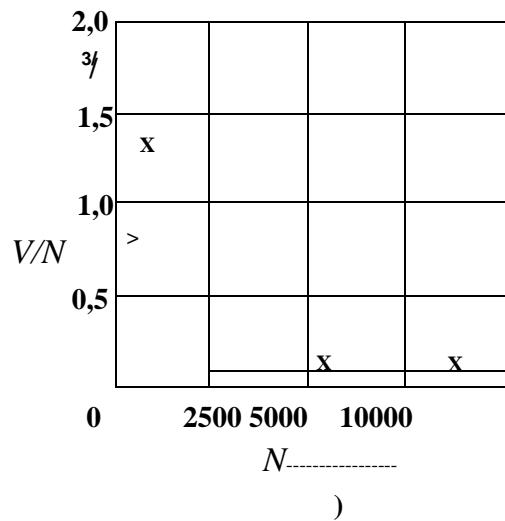
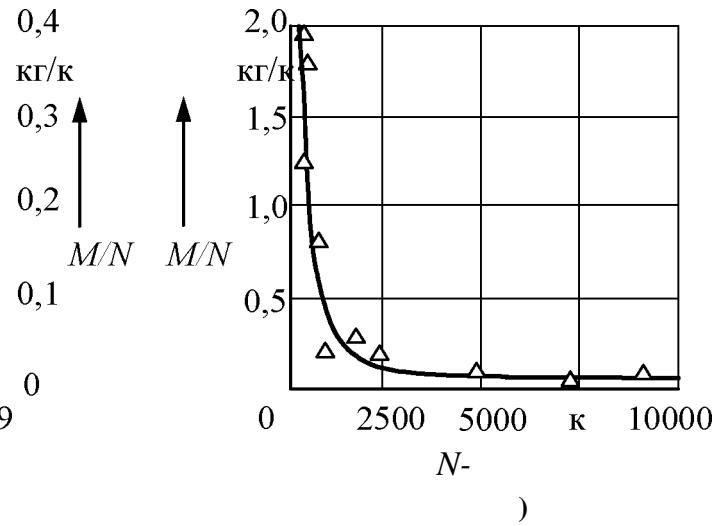
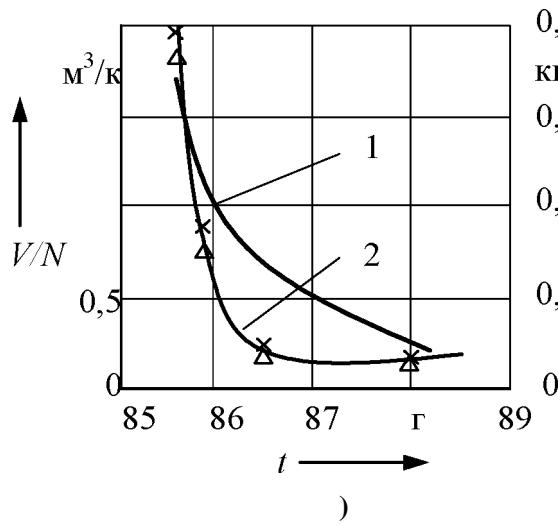
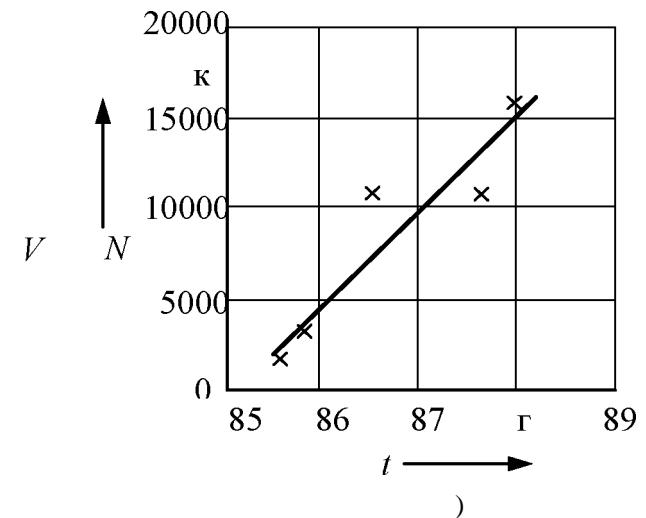
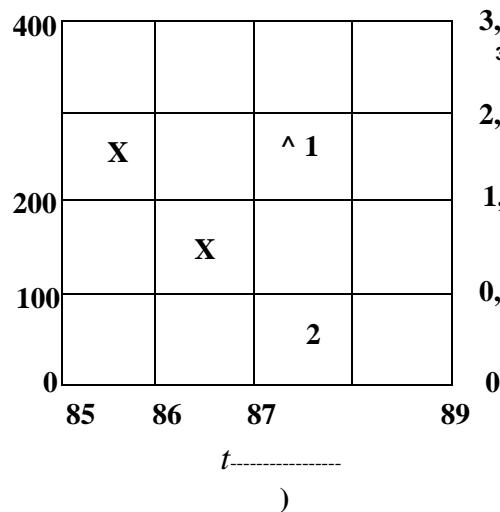
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. 2. : -  $M = f_1(t)$  ( 1),  $V = f_2(t)$  ( 2); -  $N = f_3(t)$ ; -  $M/N = f_5(t)$  ( 1),  
 $V/N = f_4(t)$  ( 2); -  $1 - N = f_6(t)$ ; -  $V/N = f_7(t)$ ; -  $M/V = f_8(t)$  ( 1),  $P = f_9(t)$

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 4. 0,1 - \* 0,5 ; , -  
 5. 1,5 2,5 ; , -  
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 ; V - ; N - ; M, V, N -  
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## THE ANALYSIS OF RESULTS OF THE IMPLEMENTATION OF AUTOMATED SYSTEMS MONITORING, TEST PROGRAMMES FOR THE AUTOMATED DESIGN SYSTEM AND SOFTWARE AIMED AT PASSING ACCEPTANCE TRIALS

Lebedev A.M.

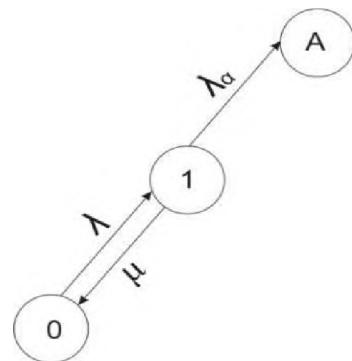
General regularities of implementing automated test systems, test programmes for the automated design system and software are considered. The given regularities include the economic effect, increase of test validity, dimension-weight, energy-consuming and information characteristics.

Key words: analysis, economic impact, the structure, the coefficient of automation.

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	-	-	-	-		-	-	
1	1	0	0		52	$\frac{52}{2450} = 0,021$		
2	0	1	0		51	$\frac{51}{2450} = 0,02$		
3	0	0	1		-	43	$\frac{43}{2450} = 0,018$	
4	1	0	1		-	95	$\frac{95}{2450} = 0,039$	
5	0	1	1		-	94	$\frac{94}{2450} = 0,038$	

$$\dots, \quad ( ) = 1, P( ) = 0, P_A( ) = 0$$

$$\begin{aligned} \frac{dP_0}{dt} &= - + J \\ \frac{dP_I}{dt} &= + - o - jP_I - - I \\ \frac{dP}{dt} &= + - I \end{aligned} \tag{1}$$

$$P \quad \frac{dP}{dt} + /jP_I + AP_I \tag{2}$$

(2)

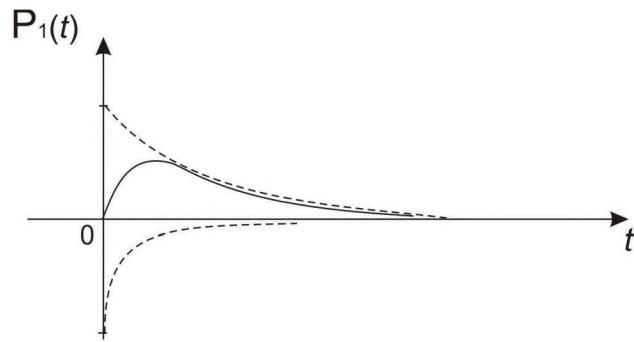
$$\frac{dP_I}{dt} + ( + X)P_I = X^p \theta$$

$$P_{-}(t) = \frac{e^{v} \left[ e^{-\frac{-+ + - I \cup + + -}{2} t} - e^{-\frac{-+ + - I \cup + + -}{2} t} \right]}{V - 2}$$

	-	-	-		-	-	-
1	1	0	0	,	114	$\frac{114}{2450} = 0,046$	
2	0	1	0	-	67	$\frac{67}{2450} = 0,027$	
3	0	0	1	-	43	$\frac{43}{2450} = 0,018$	
4	1	1	0	/ , -	181	$\frac{181}{2450} = 0,074$	
5	1	0	1	, , /	157	$\frac{157}{2450} = 0,064$	
6	1	1	1	, , , / - -	224	$\frac{224}{2450} = 0,091$	

$$P(t) = \frac{\frac{+ +}{-} + j \frac{+ + - -}{-} I_2 H |_t}{V} e^{- \frac{+ +}{2} t} - e^{- \frac{+ + - -}{2} t} I_t$$

(t) . 2.



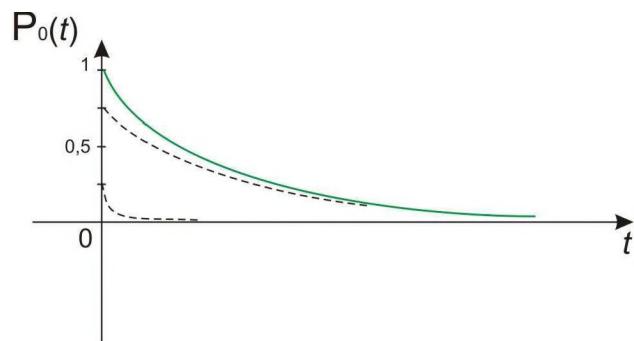
**Рис. 2.** График функции  $P_1(t)$

$$\lim P(t) = \lim Q(e^{rit} - e^{rt}) = 0.$$

$P_0(t)$  (2)

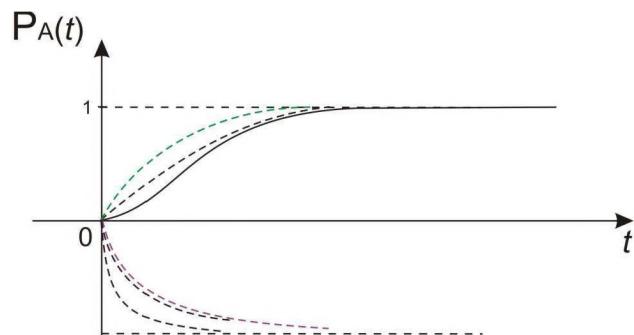
$$Po(t) = \frac{dp}{dt} + P^p i + X_a p_i - i X \frac{d}{dt}(ce + C_2 e^r) + (p + X, ice + C_2 e'')$$

. 3.



**Рис. 3.** График функции  $P_0(t)$

$$Pa(t) = \frac{1 - e^{-it}}{2} + \frac{1 - e^{-r_2 t}}{2} + \frac{1}{V \ln r_2 / r_1}$$

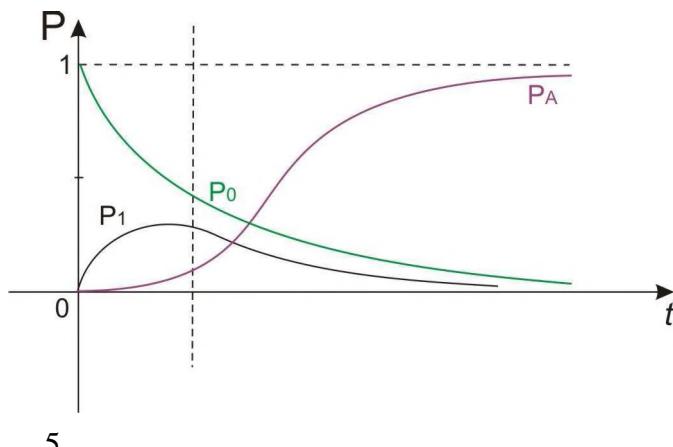


. 4.  $P_A(t)$

$$P_7(t), P_0(t) \quad P_A(t)$$

. 5.

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$$= \frac{2219}{2450} = 0,905714285; 1 \stackrel{?}{=} \frac{1}{2450} = 0,000408163; I \stackrel{?}{=} \frac{2220}{2450} = 0,906122448.$$

; ,  $j_u = 0,803\dots$

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## CREATION OF STUDENT-PILOT RELIABILITY PROBABILISTIC MATHEMATICAL MODEL BASED ON ANALYSIS ACCORDING TO ERRORS STATISTICS DURING TRAININGS

**Lebedev A.M., Neskin V.A.**

It is examined the probabilistic mathematical model of student-pilot reliability, intensity of student's errors event of student's errors correction by the instructor, also the intensity of event's cascade (errors) that are not corrected by the instructor ( equal to aviation event-incident, catastrophe and so on ). The solution of the system can be made analytical.

**Key words:** flight safety, reliability, intensity of mistaken actions.

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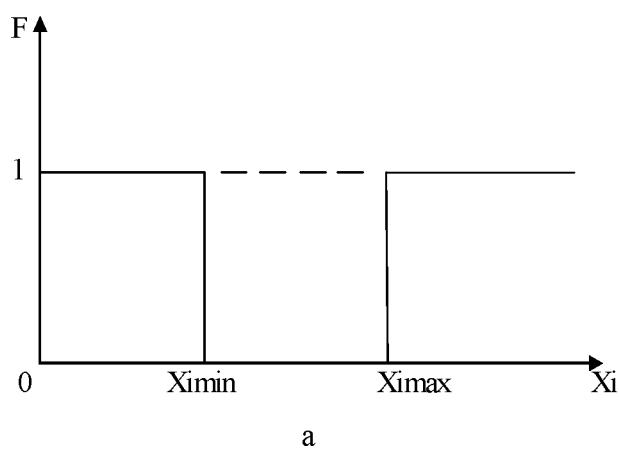
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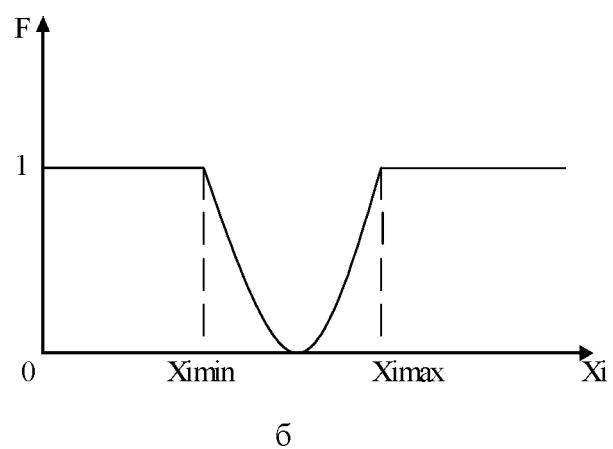
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629.735:629.7(07):658/562:621.396:681.5:338.45(075.8)

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 $; X_{imM} \quad \frac{X_{i-} + X_i}{2} \quad X_{imax} \quad X_i \quad T; X_{imax} -$   
 $; X_{imin} -$

$$F = \frac{2(X_i - \bar{X})^2}{T} \max_{i=1}^n \frac{X_i - \bar{X}}{X_i - \bar{X}}$$

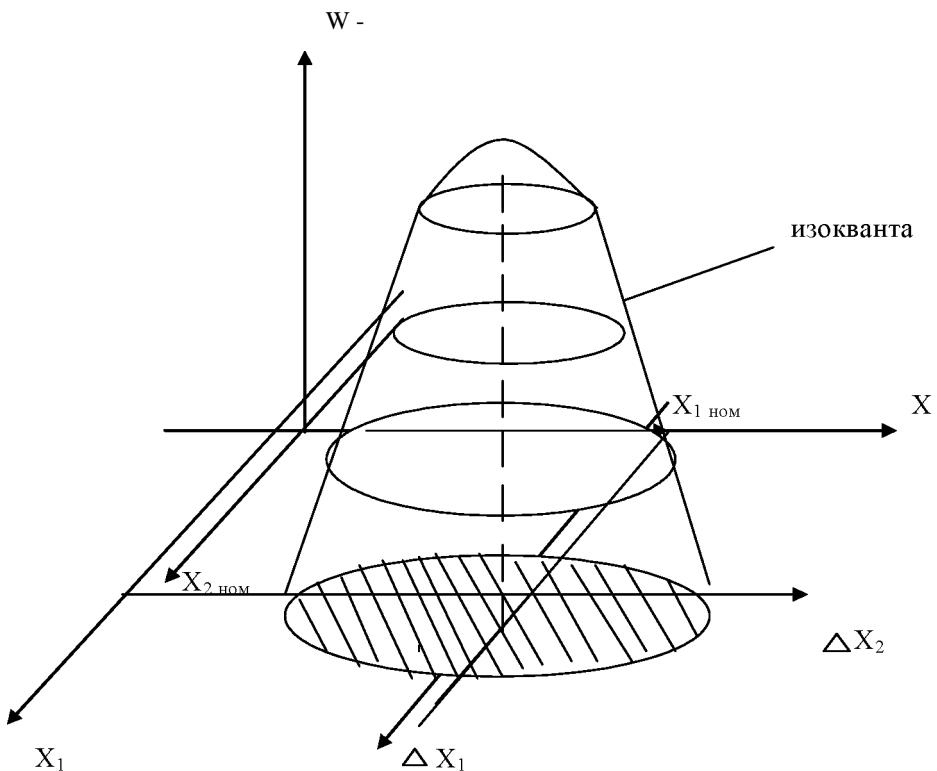
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 $\wedge \quad (\wedge)_{=1}^n \quad \wedge$   
 $k- \quad ; ai -$   
 $AX_i = X_i - X_{imM}$   
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**Рис. 2.** Вид поверхности качества

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## AVIATION SECURITY QUALITY CRITERIA DEVELOPMENT BASED ON LOSS QUADRATIC DEPENDENCE ON DIVERGENCE OF SYSTEM PARAMETERS

Krasnov S.I., Lebedev A.M.

The paper studies quality of aviation security qua service, aviation security service personnel, security engineering, performed works and based on recent trends quality criteria structure.

Key words: security, system, losses, surface quality.

, 1959 . .,

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## **TECHNIQUE OF CARRYING OUT OF EXPERT ESTIMATIONS OF ACTIVITY OF AVIATION ENTERPRISE ON SAFETY OF FLIGHTS**

Ageev A.S.

In article the technique of carrying out of expert estimations of activity of aviation enterprise of the civil aircraft directed on increase of level of safety of flights is presented.

Key words: increase of level of safety of flights, questioning, aviation enterprises, expert estimations.

, 1984 . ., (2010), , 3 -  
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[3,4,6].

[5].

$$(i = 1, n) \quad (1)$$

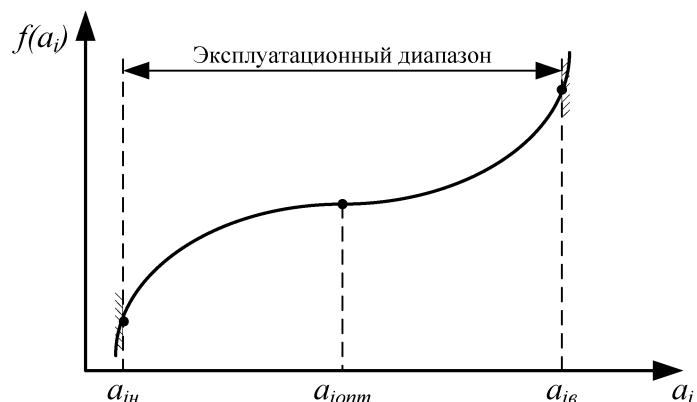
(1)

$$f(a_i) = \begin{cases} 0 & a_i < a_{ionm} \\ \frac{(a_i - a_{ionm})}{a_{iHOM}} & a_{ionm} \leq a_i < a_{ie} \\ 1 & a_i \geq a_{ie} \end{cases}$$

$$\therefore * < a_i(t) < * ( \dots , 1).$$

$$a_0 > \gamma > *, \quad a_f(t) = \begin{cases} 0 & a_i < a_{ionm} \\ \frac{(a_i - a_{ionm})}{a_{iHOM}} & a_{ionm} \leq a_i < a_{ie} \\ 1 & a_i \geq a_{ie} \end{cases}$$

$$a_0 < \gamma < a_{ie}, \quad a_f(t) = \begin{cases} 0 & a_i < a_{ionm} \\ \frac{(a_i - a_{ionm})}{a_{iHOM}} & a_{ionm} \leq a_i < a_{ie} \\ 1 & a_i \geq a_{ie} \end{cases}$$



**Рис. 1.** Распределение значения  $a_i'(t)$  относительно  $a_{ionm}$

$$aj'(t) \quad (1) \quad a_i(t), \\ : 1 > aj'(t) > 0.$$

$$\begin{aligned}
 a_i'(t) &= a_i(t)/a_{i0} & a_i'(t) &= a_i(t)/a, \quad ; \\
 a_i(t) &= a_i(t)/a, & & ; \\
 a_i(t) &= a_i(t)/Ma_i; \\
 a_i^{(t)} & \quad [a_i^{(t)} \sim a_i^{1/a_i}] \quad , \\
 a_i & a_{i0}, a_{imax}, a_i, Ma_i - & , & , \quad 1 - \\
 (\quad) & & & \\
 a_i(t) &< a^*, \\
 a_i'(t) &< 0.
 \end{aligned}$$

$$ai, a_2, \dots, a_n, \dots, l, k_2, \dots, k_n$$

$$Iup = \sum_{i=1}^n a_i(t) \cdot k_t - 100 \% , \quad (2)$$

$$n = \dots, 0 < i(t) < l; \dots ; i(t) =$$

$$\sum_{i=1}^n k_i = 1, \quad k_i > 0,03 \quad n < 10.$$

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	$I$	$2$	$3$	$i$	$n$	
$a_i$	$a_1$	$a_2$	$a_3$	$a_i$	$a_n$	
$a_{iH} *$	$aiH^*$	$a2H^*$	$a3H^*$	$a^*$	$a_nH^*$	
$a_{ie} *$	$I^*$	$a2e^*$	$a3e^*$	$ai\ddot{e}$	$a^*$	
	$aI$	$a2$	$a3$	$aiH(3M)$	$a_n$	
$a_i'(t)$	$ai'(t)$	$a2'(t)$	$a3'(t)$	$a_i'(t)$	$a_n'(t)$	$\sum a_i'(t) < n$
	$ki$	$k2$	$k3$	$ki$	$k_n$	$\sum k_i = I$



## **THE INTEGRATED ESTIMATION OF THE AVIATION JET ENGINES FLIGHT VALIDITY**

Karmyzov M.V., Monakhova S.V.

This article about the method of an integrated estimation of the flight validity aviation jet engines for civil aircraft.

Key words: Integral assessment, industrial safety, aviation enterprise.

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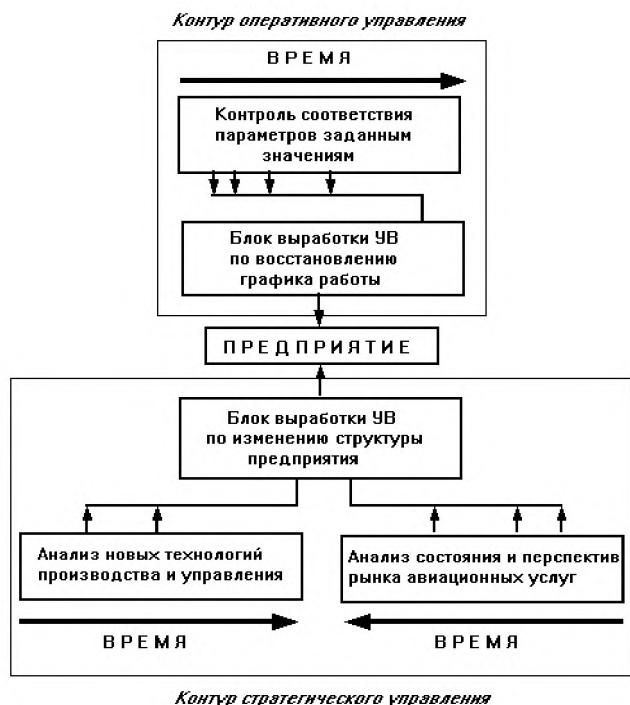
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## **INFORMATION SUPPORT OF STRATEGIC MANAGEMENT SYSTEM AT THE AIRCRAFT OVERHAUL COMPANY**

Borisov J.A., Solovjev B.A.

The article explains why an information support of an aircraft overhaul company management needs a special approach in a market economy. It suggests the development of operational and strategic management frames and studies interaction of strategic management frame blocks while making a decision on the control action implementation. The article contains the methods of the strategic management development at the aircraft overhaul company, describes how to obtain a medium-term forecast of the company activity in implementing of control action and gives a case study of strategic management frame work.

Key words: management, circuit, block, strategic model.

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$$\begin{aligned}
&= P_z (S_z)^* \bullet Py(0) \bullet n_z(opp) \bullet 1 + - \quad \left| \begin{array}{c} z \\ \hline W & + \frac{A_x}{A_Z 2} \bullet \hline V \end{array} \right| + \\
&\quad \left| \begin{array}{c} A \\ \hline V - (O_i) \end{array} \right. \quad A \\
&\quad ; \quad P_z (S_z)^* - \\
&\quad ; \quad P_y(0) - \\
&\quad ; \quad n_z(opp) - \quad ; \\
&\quad i - \quad ; \quad A_x, A_y, A_z - \quad - \\
&\quad , \quad ; \quad A_{xy} - \quad ; \\
&\quad ; \quad - \quad ; \\
&\quad ; \quad V \quad ; \\
&\quad 2^{*1} - \cos 0 ) - \quad ; \quad O_i - \quad i - 
\end{aligned}$$

$$P_z(S_z)^*$$

$$P_z(S_z) = j p S_z \, dz \, da_z, \quad (2)$$

$$a_z = S_z + z_l - z_2; \quad z_1, z_2 =$$

$$, \quad f^{az}$$

$$(S_z, az) = \int f^m(z) / TVE' (S_z + z - az) dz \quad (3)$$

$$/ TVE = c$$

$$(3), \quad (2)$$

$$P/(S_z) = \int f^{VVI}(z) f^{VVI}'(S_z + z - a) dz da_z. \quad (4)$$

$$P_z(S_z) = 24 j / TVE (z) / TVE' (S_z + z - az) dz. \quad (5)$$

$$f / TVE_f, \quad f / f^{az} \\ / (z) = j / (a_i \bullet / (z - a_i) da_i, \quad (6)$$

$$/ ASE = ASE($$

$$); / AAD -$$

$$(AAD_{amun+amun}).$$

$$/ AAD,$$

$$, \quad AAD_{mun}$$

$$AAD_{amun}, \quad / AAD$$

$$DE- \quad AAD_{mun}, \quad ,$$

$$/ AAD$$

$$DE-, \quad ,$$

$$\rho^{MD}(a) = (1-a) \bullet \frac{1}{-AAD_{mun} * 2} e^{\frac{AAD}{-amun}} + a \bullet \frac{1}{-AAD_{mun} * 2} e^{\frac{AAD}{-amun}}$$

$$-mu! - \quad AAD_{mun};$$

'AAun -

$$[0,1]. \quad (1).$$

$$P_{\tilde{z}_i}(S_{\tilde{z}_i})^*$$

f<sup>TVE</sup>

1

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ASE

$$f^{AAD},$$

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$$+ P_z \sum_{i=1}^n (\mathbf{S} \mathbf{z}_i)^{\text{cl}} / \mathbf{d} \bullet \mathbf{X} \quad (cross(\mathbb{C})) \vdash 4 \quad yr; (\mathbb{C}) \quad \mathbf{X}$$

/d -

;  $P_z(\mathbf{S}_z)^{\text{cl}} / d$  -

3

$$t_z \frac{2X}{c}$$

1

$Pf^d$  $; n^{c/d}$  $; z_{ci}$  $i$  $; -$  $z_{ci}$ 

(8)

$$\begin{aligned}
 & f^{cl/d} \frac{\mathbf{21}}{z_c} \left[ P_y(0) \wedge n_z(\partial PP) \wedge \left| \begin{array}{c} 1 \\ 1 \end{array} \right. \right] + \\
 & \quad \left| \begin{array}{c} y \\ V \end{array} \right. + \frac{I_x}{I_2} \left| \begin{array}{c} z \\ V \end{array} \right. + \\
 & \quad + \sum_{i=1}^n n_{\mathcal{Z}}(\text{cross}(\mathbb{C}_i)) \cdot \frac{1}{VZ(\mathbb{C}_i)} \cdot \frac{c}{1} \\
 \end{aligned} \tag{10}$$

 $c$  $P_z(S_z)$  $P_z^w(S_z)$  $pw(Sz) = P^w \cdot P_z(0)$  $P^{wl}$  $; P_z(0)$ 

$$\begin{aligned}
 & N_{az}^w = P^{wl} \cdot P_z(0) \cdot \\
 & \quad + \frac{n_z(\text{cross}(\mathbb{C}_i))}{I_1} \cdot \frac{1}{VZ(\mathbb{C}_i)} \cdot \frac{c}{1} \cdot \mathbf{Jy} \\
 & \quad + \left| \begin{array}{c} 1 \\ I \end{array} \right. + \frac{y}{2V} \left| \begin{array}{c} 1 \\ I \end{array} \right. + \frac{z}{2V} \left| \begin{array}{c} 1 \\ I \end{array} \right. + \\
 & \quad P_y(0) \cdot n_z(\partial PP) \left| \begin{array}{c} 1 \\ I \end{array} \right. + \frac{y}{2V} \left| \begin{array}{c} 1 \\ I \end{array} \right. + \frac{z}{2V} \left| \begin{array}{c} 1 \\ I \end{array} \right. + \\
 \end{aligned} \tag{11}$$

 $N_{az}^{wl}$

Pw

$$r)wl - \frac{1}{T} \nabla^1 jwl$$

*tw* - ;  
*T* - ;

n<sup>w</sup>

tC<sup>1</sup>,

$$P^{wl} = \frac{1}{n^{w\bullet l}} t^{wl}$$

$$-\frac{jW^n}{nW_n^*} \frac{l^n}{l} X''' - JWl \\ , \quad (11)$$

$$N_{\text{total}}^{labeled} = N_{\text{train}}^{*} + N_{\text{validation}}^{cl/d} + N_{\text{test}}^{wl} \quad (13)$$

$$N^{\nu_{-}} \quad , \quad N^{\nu_{+}} \quad , \quad N^{\nu_{\pm}} \quad .$$

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## **OVERALL RISK ASSESSMENT FOR IMPLEMENTATION OF RVSM IN THE RUSSIAN FEDERATION AND EURASIA REGIOIN**

Kravtsov V.V.

This article deals with the overall risk assessment for implementation of RVSM in the Russian Federation and Eurasia region.

Key words: safety assessment, collision risk, overall risk, RVSM.

, 1966 . ., . . . (1988),  
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RVSM.

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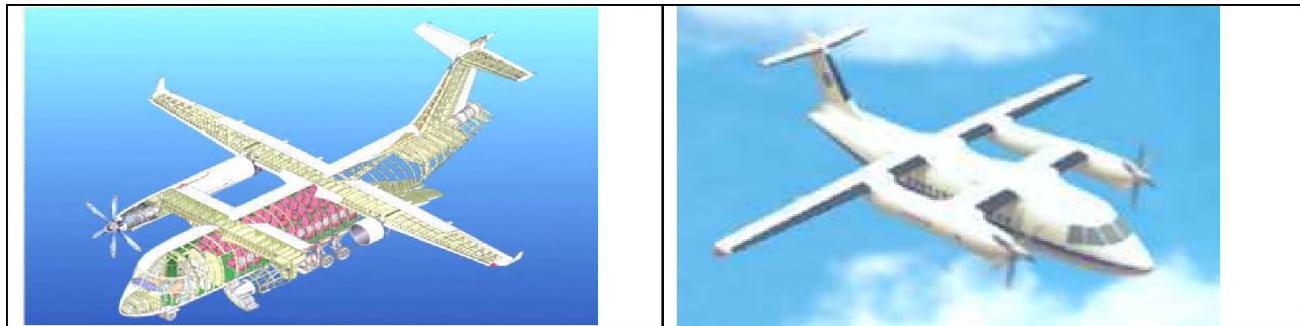
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t	-259,21	-182,49	-183,27	-187,69	-138,33	-129,72	-60
t ^	-252,78	-161,73	-88,63	-42,07	-0,50	36,07	180
t . ^ C	6,43	20,76	94,64	145,62	137,83	165,79	290
. /	77,15	453,4	650,7	733,1	736,4	762,2	835
., /	71,05	422,4	546,4	582,0	601,5	610,5	665
Q , /	114480	50060	47520	46390	45740	45390	43290
Qv.ra, /	8832	22700	30920	34010	33680	34550	36150
Q^- , /	8136	21150	25970	27000	27530	27710	28900
, /	455,1	511,2	485,7	424,0	385,5	3575	287
	510	542	518	470	405	284	-
* , /	267	33,8	40,1	39,0	37,9	38,5	39
, % ( )	4,1	5,3	3,0	2,2	1,9	-	1,2
, % ( )	75,0	15,0	12,5	9,5	8,5	-	7,1
Ro, /( )	4157,2	518,8	276,7	188,6	143,2	115,5	59,4
L° /	34,5	17,19	16,05	15,65	15,42	15,29	-

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## **ANALYSIS EXPERIENCE OF ALTERNATIVE FUELS ON AIRCRAFT**

Sargsyan D.R.

In article the technique of carrying out of expert estimations of activity of aviation enterprise of the civil aircraft directed on increase of level of safety of flights is presented.

Key words: increase of level of safety of flights, questioning, aviation enterprises, expert estimations.

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 \end{aligned}$$

$$= {}^B O + {}^B I \cdot I + {}^B Z^X 2 \dots + {}^B j^X_1 \dots + {}^B m^X m \quad (1)$$

$$( \quad ) ; x_j = ( \quad / \quad ) ; Bj = \dots \\ ; j = 0, 1, \dots ; \% - . \\ Xj ,$$

bj Bj

$$= \theta_0 + l_{\alpha} - f \quad (4)$$

$$S = Z=1 \quad - \quad - \quad ), \quad (5)$$

$$1 = Ei = \frac{1}{I} \left( \frac{1}{\alpha^2 - \beta^2} + \frac{\alpha^2 - \beta^2}{(\alpha^2 - \beta^2)^2} \right) ; \quad (6)$$

(3)

$$E = i \cdot \dots) = Ei(y_t \cdot \dots)^2 + Eh(\dots, \dots), \quad (7)$$

$$= \dots - \dots - (\dots - \dots) . \quad (8)$$

$$R^! \equiv \sum_{i=1}^n (\text{---}, \text{---}) / \sum_{i=1}^n (\text{---}, \text{---})^2,$$

R

$$\wedge'' = (\ , \ -\ , \ )^2$$

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$$= xp + e, \quad (9)$$

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(\bullet 1); \quad ;

$$b = (x'x)^{-1} x'y, \quad (10)$$

$$; x' -$$

$$= xb. \quad (11)$$

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$$= \dots, \dots = \dots,$$

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**THE ALGORITHM OF FACTOR ANALYSIS OF SAFETY INDICATORS  
FROM CAUSES OF FACTORS**

Haidarov R.A.

In the article the algorithm of multiple regression analysis, aimed at increasing the level of flight safety.

Key words: algorithm, model, a method of regression analysis.

656.7.01.078.13; 658.012.2.656.7

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$$p = 1 - n/N, \quad (6)$$

n - , N -

$$P_S$$

$$P = Y^n - p \quad P \quad (7)$$

$$P_B =$$

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$$E, \quad S, \quad R.$$

$$Q = \langle E, S, R \rangle. \quad (8)$$

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## THE STATES AND PROPERTIES CONCEPTS OF PRODUCTION ORGANIZATION STANDARDS IN TRANSPORT COMPLEXES STUDY

Plotnikov N.I.

The of quality and properties and reliability states, efficiency and security concepts study in order to establish relationship in practical use in the transport systems production standards.

Key words: transport complex subject, category, reliability, tasks of supervision.

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656.7.01.078.13; 658.012.2.656.7

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- , storability -  
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- , up state -
- , disabled state:
- , limiting state -
- , critical state -
- , damage -
- , fault -<sup>2</sup>
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( ), maintenance -

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$$D : \{D \mid D, D, \dots, D, r\} = D. \quad (1)$$

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T:

$$\begin{aligned} p & \\ t & \\ p(t) &= p\{T > t\}; \end{aligned} \quad (2)$$

$$q(t) = q\{T < t\}. \quad (3)$$

$$p(t) + q(t) = 1,$$

$$P(t) = 1 - P(t) \quad (4)$$

$$p(t) = 1 - q(t). \quad (5)$$

$$p(t) = \frac{N - n(t)}{N} \quad (6)$$

$$\begin{aligned} N - & \\ t. & \\ ; n(t) - & \end{aligned}$$

$$q(t) = 1 - P(t) \quad (7)$$

$$\begin{aligned} \text{operation availability } & \\ {}^6oa = {}^6ap(t) & \end{aligned} \quad (8)$$

$t_p$ ,  
 $p(t_p)$

$$= \text{''}I\underline{t}^i(I^i t_i \pm I^j \dot{t}_i = I^j, ) \quad I = I^j \quad (9)$$

$L$ -  
 $i$ - ; ; -  
 $j$ - , ;  
 $m$ - ;  $n$ - ;  $k$ -

4.

$$H_n$$

$$n = \text{, } \{M \setminus s(M)\}, \quad (10)$$

s.

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accuracy,

[7].

$$Hn = m/N, \quad (11)$$

$m$ -  
 $N$ - , action  
 $a_t$ ,  
 $(SOP)$ ,  
 $t_1, t_2, \dots, t_t$ ,  
 $+ At.$

(12)

(?) -

;  $\frac{f}{T} > -$ 

$$X = Ijt$$

$$T_p = T_a + T_r$$

$$T_r$$

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G,

$$G = X_R X_N, \quad X_R < X_N \quad V < T \quad (13)$$

$$G = X J X_n, \quad X_r > X_n \quad V < T (G < 1), \quad (14)$$

 $X_R$  -;  $X_N$  -;  $V$  -

;

$$= |X_r - X_n|.$$

(15)

o -

$$= (J X_n) 100 \%. \quad (16)$$

$$= M + 2^\wedge,$$

(17)

 $M = \dots + m_k$ 

$$Vff\bar{f} + ff2^a + \dots + ^\wedge$$

(18)

,

$$j = {}^D j \cdot S m n \cdot$$

(19)

 $D_j$ 

$$D_j, \quad \delta_{mm} \cdot$$

$$j,$$

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7.

$$H_{\perp} = H_{\parallel} I - H_{\perp} T^{\dagger} \quad (20)$$

 $H_{\perp}(T_r)$ 

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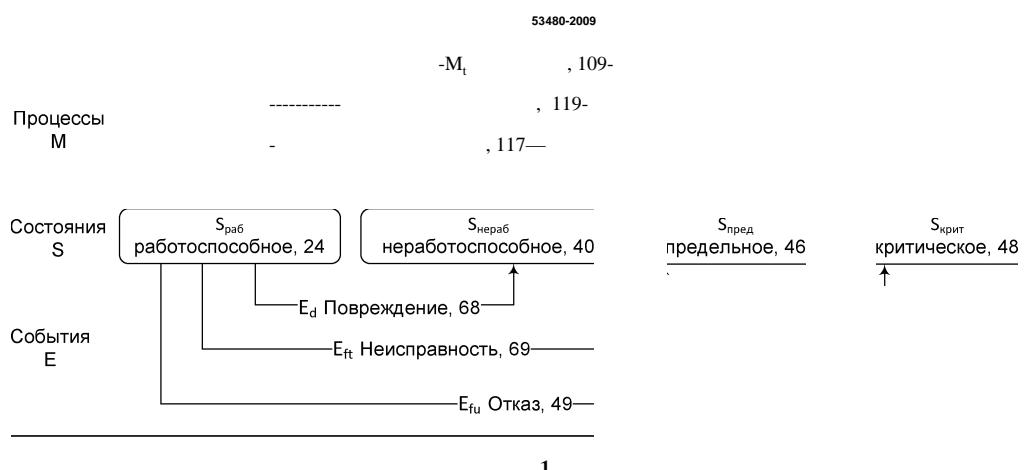

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[4], ..., (..., 1).



$$f: \{Q, S, M, E\} \rightarrow \{1, 2, \dots, n\} \quad (21)$$

$$Q - \left( s_{\text{--}}, S_{\text{--}}, S_{\text{--}}, S_{\text{--}} \right); S - : \quad , \quad , \quad , \quad , \quad , \quad -$$

$$S_{ij} \wedge S_{i'j'} = \sum_{k=1}^n S_{ijk} S_{i'jk'}.$$

$$D \cdot E_t \left( \quad , \quad , \quad \right) -$$

$$D = Q : \delta_i(E_i) M_i \begin{cases} E_t << M_t \\ E_i < M_t \end{cases} \quad (22)$$

1. ( ) .
2. ( . 1). ,
3. .

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( . . . , 1994)

[12, . 22].

$$[ \quad , \quad ] = (\quad )], \quad [ \quad , \quad ].$$

1. . . . . , 2002. / . . . . , . .  
2. . . . . ; . .  
2008.  
3. :  
4. - . . . . , 1992. 2010.  
5. - 53480-2009. -  
5. . . . . , 1999.  
6. . . . . , . .  
7. . . . . , . . , 2007.  
8.  
9. . . . . , 2003. / . . . .  
10. . . . . , 2004.  
11. . . . . , 1981.  
12. // . . . . - 2008. - 1. - . 61-65.  
13. . . . . , 2007.  
13. . . . . , 1984. / . . . .

## **TRANSPORT COMPLEX REGULATORY AND RELIABILITY STUDY AND SIMULATION**

Plotnikov N.I.

Explores the possibilities of using the theory of technology reliability and its content transfer to develop theoretical reliability of the transport complex. Is the overall objective of the regulatory monitoring reliability of the transport complex.

Key words: modeling, object, machine reliability, method.

, 1946 . . . (1973).

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• • ,

[1] -

[2].

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. 1.

[3]

$$Q = \left[ \begin{pmatrix} x_1 & x_2 & \dots & x_n \end{pmatrix} \right] =$$

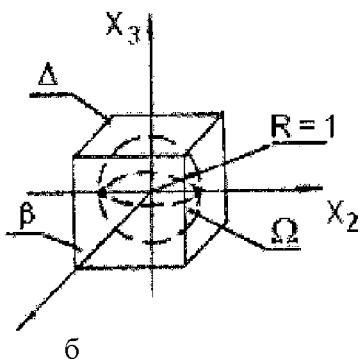
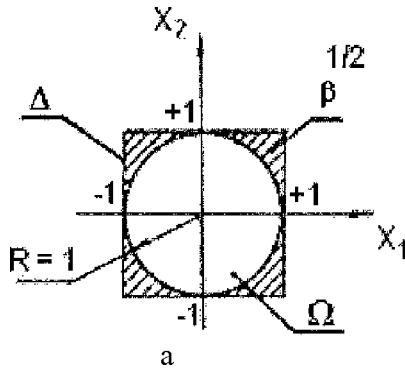
$\vdash [(x_1, x_2, \dots, x_n) = ] \bot$

; P[(x<sub>1</sub>, x<sub>2</sub>, ..., x<sub>n</sub>) ] -

$$[ (x_1, x_2, \dots, x_n) ] = 1,$$

$$\vdash v_A = 1; v_n =$$

; V =



1.

$$\vdash \neg v_a, \vdash \neg v_n,$$

,

$$v_e = v_a - v_n.$$

$$x_2 \wedge x_n) c Q] = V_n.$$

$$P[(x_1, x_2, \dots, x_n)] = 1 - \sum_{V_A} \frac{1}{A^n}$$

[4].

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n-

$$v_A = (2 \bullet R) - 2^n - R^n.$$

n-

$$- n^{n/2} \bullet R^n$$

$$(2+1)$$

R

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; n-

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$$x_2, \dots, x_n) \wedge] \underline{\quad} \quad \quad \quad (1)$$

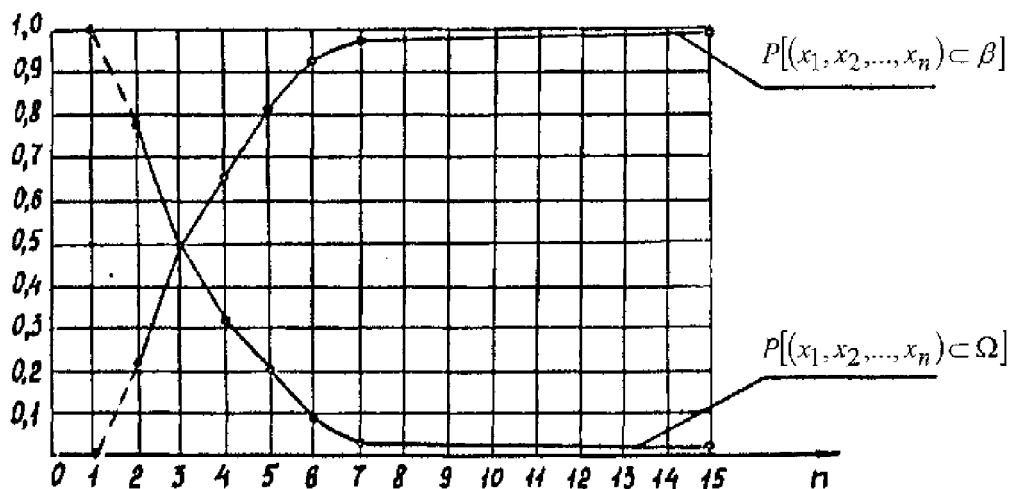
$$\frac{2^n (2)}{-n/2}$$

$$P[(x_1, x_2, \dots, x_n)] \underline{\quad} \quad \quad \quad (2)$$

$$2^n - 1 / 2 + 1$$

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 , (1) (2), . 2.  
 (1) (2), , . 2,  
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 [2], .  
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$n$	1	2	3	4	5	6	7	8	9	10
$\wedge X_2 \dots )^\wedge]$		0,2146	0,7854	0,4764	0,5236	0,6916	0,31	0,8355	0,1645	0,9125
$P[(x_j, 2, \dots )^\wedge]$			0,08075	0,02083	0,97917	0,00249	0,99751	0,0003	0,9997	0,00002



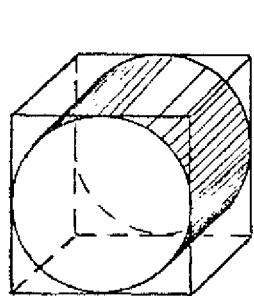
. 2.

$$n=2: \quad l(\wedge_2) \quad | \quad S_{--}^2 - \frac{4}{S} = I - \frac{1}{44} = I - = 0,2146,$$

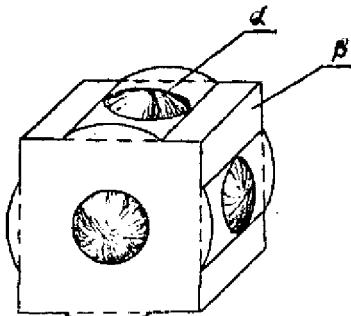
$$V = \frac{2}{3} \cdot \frac{1}{6} \cdot \frac{1}{4} = \frac{1}{36}$$

D- ; V -

$[(1, 2) \quad 0] < [(1, x_2, \dots) \quad 0]'$



a)



6)

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1. . . . . , 1982.  
 2. . . . . , 1975.  
 3. . . . : .  
 - . . . : . , 2005.  
 4. . . . ( ) . . . , 1972.  
 - . 1, 2.

## **THE ANALYSIS OF SIZE OF ADMISSIONS DEFECT AND ITS DEPENDENCE ON NUMBER OF CONTROL**

Eroknin E.V.

In given article has been made analysis of size of admissions defect and its dependence on number of control parameters for a case of the law equal density for finding-out an essence of admissions defect by the most simple method.

Key words: admittance control, defect destination tolerances, the law of equal probability density, the risk of the customer, the hypercube.

- , 1984 . ., (2008), , 1 -  
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$$+ + + = 1,$$

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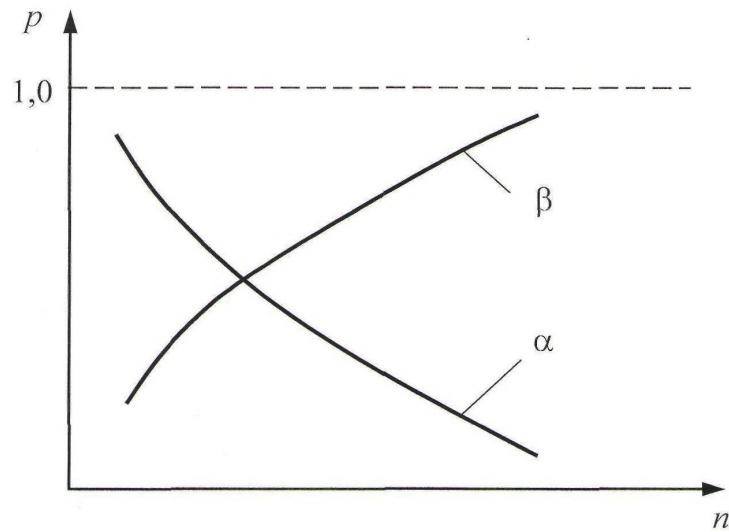
[6]

[5].

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[7]

1.



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$$W(1 \cdot 2 \cdots x_n) > W_{\text{bad}}, \quad x_1, x_2, \dots, x_n$$

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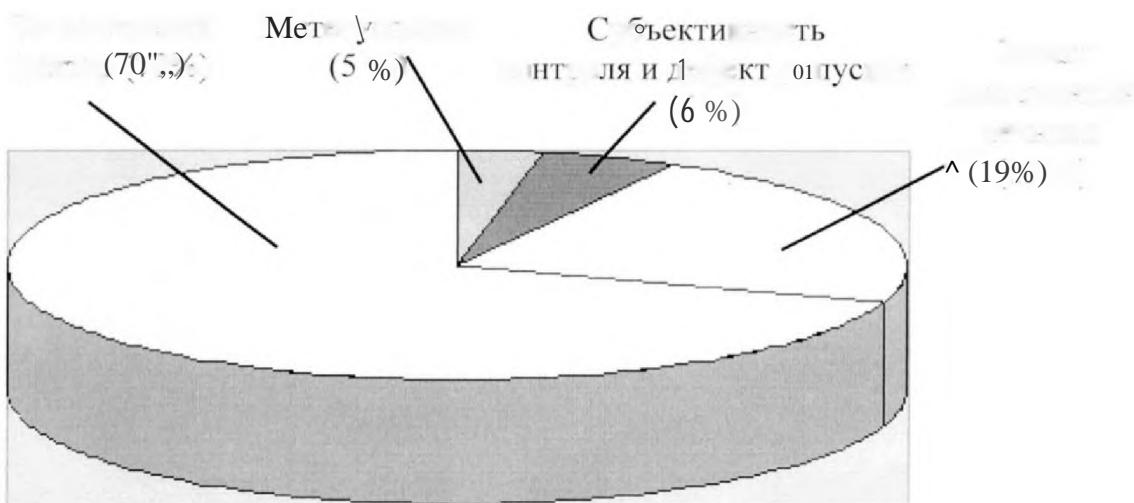
354 26. 04.88),

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20 43 % 70%

## THE ANALYSIS OF INCREASE OF RELIABILITY CONTROL

Eroknin E.V.

Various methods of reliability control are considered in this article, which methods have been devoted quantity of works by various authors, and also their short analysis is carried out. The estimation of influence of reliability control is also resulted on level of safety. Methods reducing influence of the given factor on safety of flights are considered too.

**Key words:** safety, reliability control, defect destination tolerances, the risk of the manufacturer, the risk of the customer, systems of automatic control.

, 1984 . . , (2008),

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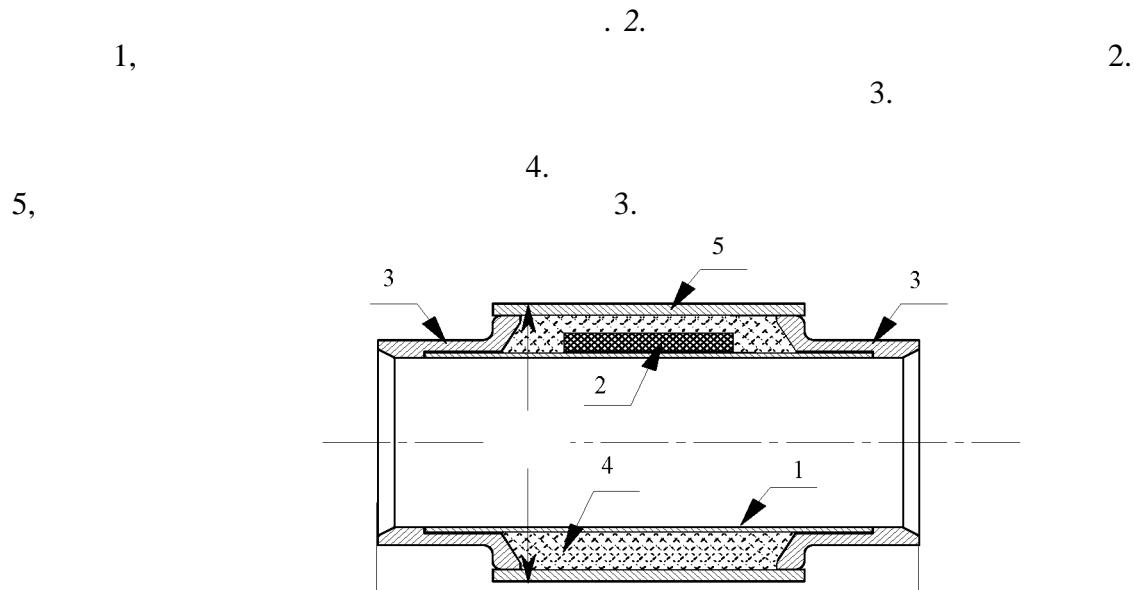
« »  
( )

$$( \quad , \quad , \quad , \quad , \quad , \quad , \quad )$$

$$q_t = k Q_m C(t - 1), \quad (1)$$

$q_t$  - ;  $k$  - ;  $Q_m$  - ;  $1$  - ;  
 $1$  - ;  
(1),

$$( \quad , \quad )$$



**Рис. 2.** Конструкция позисторного датчика расхода

$$U = U \cdot I, \quad (2)$$

$$U \cdot I_{CT} = kQ_m C(t - 1), \quad (3)$$

$$\frac{Q_m}{kC(t - t^\circ)} = \frac{U}{\bullet} \cdot \bullet \quad (4)$$

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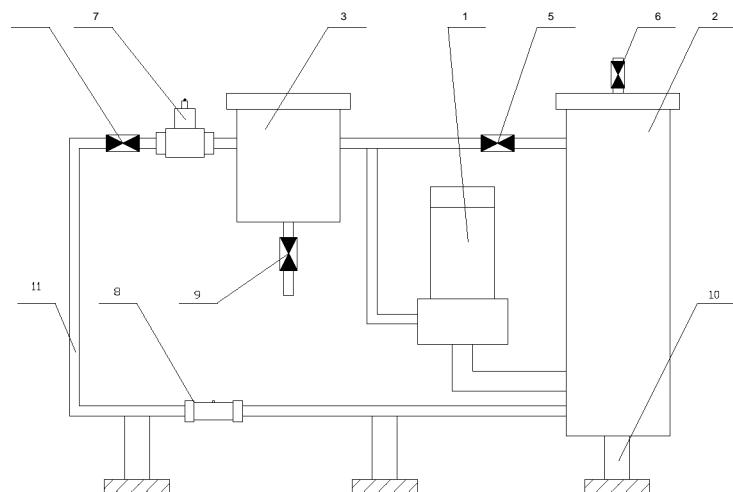
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30 - 33,5 , ( . 1)

1

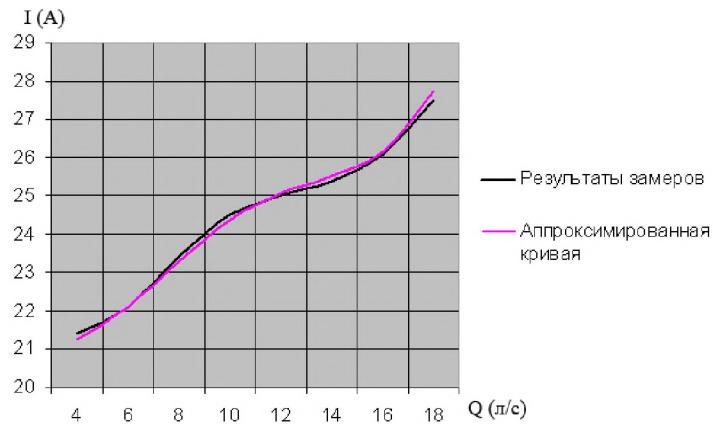
U( )	25	32	33,5	36	45	60
I1( )	19,4	21,2	27	25	19	11,1
I2( )	21,3	28	31,3	30,5	23	14,3

( . 2).

32 .

2

Q( / )	4	6	8	10	12	14	16	18
I( )	21,4	22,1	23,4	24,5	25	25,4	26,1	27,5



. 5.

(5)

$$Q = 0,000875I^4 - 0,036211^3 + 0,5111I^2 - 2,41381 + 24,85 \quad (5)$$

## EXPERIMENTAL INVESTIGATIONS OF SPRAYING EQUIPMENT SENSORS OF AIR VEHICLES

Dudnik V.V.

This article shows possibilities of foundation of simple and reliable sensor of chemical liquid consumption of cultural air vehicles. Author offers remote sensor with pozistor sensation element. Results of it experiments by spill presented.

Key words: helicopter, aviation chemical works, quality of crop dusting, liquid consumption.

, 1969 . . , (1994),

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- ( ) 1);
- ( ) 2);
- ( ) 0);
- ( ) 3);
- ( ) 4).

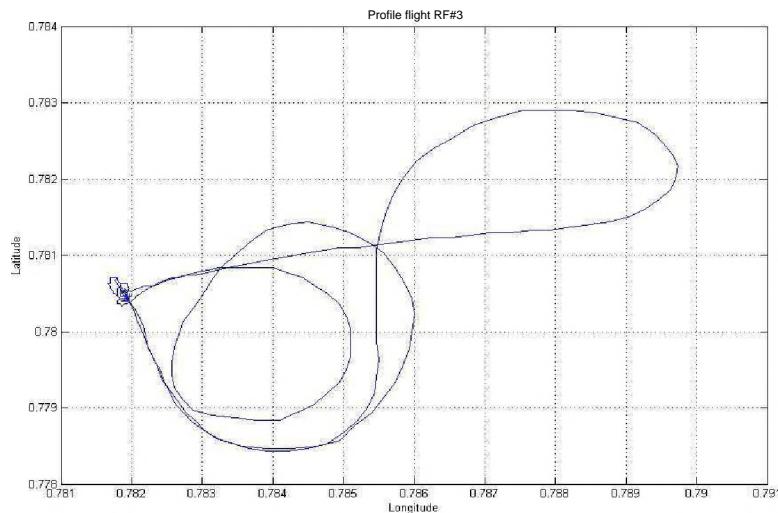
3

### System Identification Toolbox.

System Identification Toolbox.

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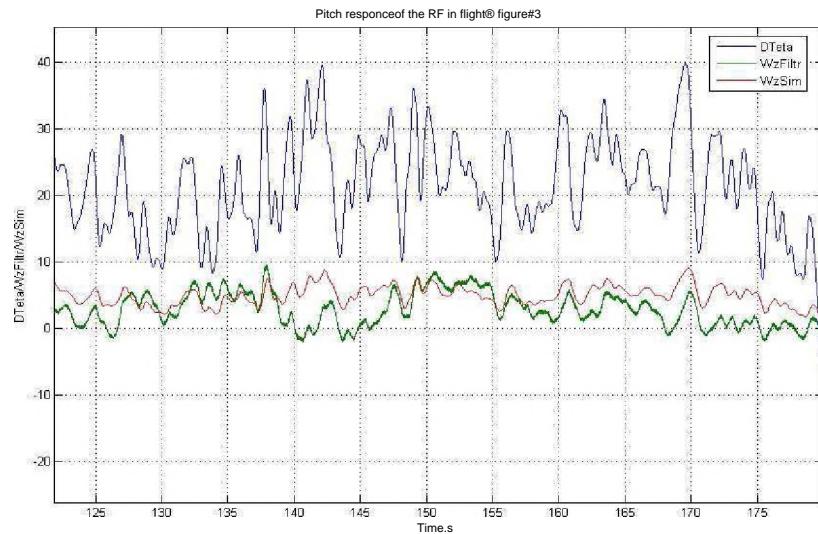
(Latitude)

3.

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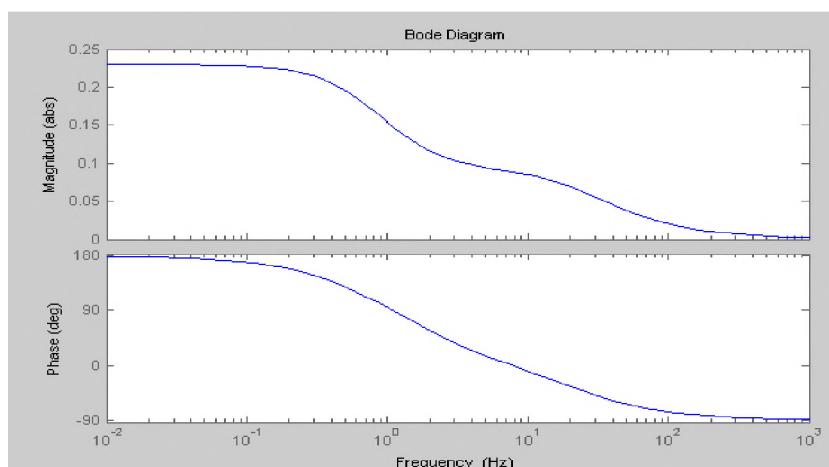
2.



. 2. (Wz Filtr, / )  
          (Wz Sim, / ),  
          (DTeta, %)

$$= \frac{0,04483z - 0,04747}{z^2 - 1,467z + 0,4785} , \quad (1)$$

$$\textcircled{R} = \frac{13,13s + 149,5}{s^2 + 147,4s + 651}, \quad (2)$$

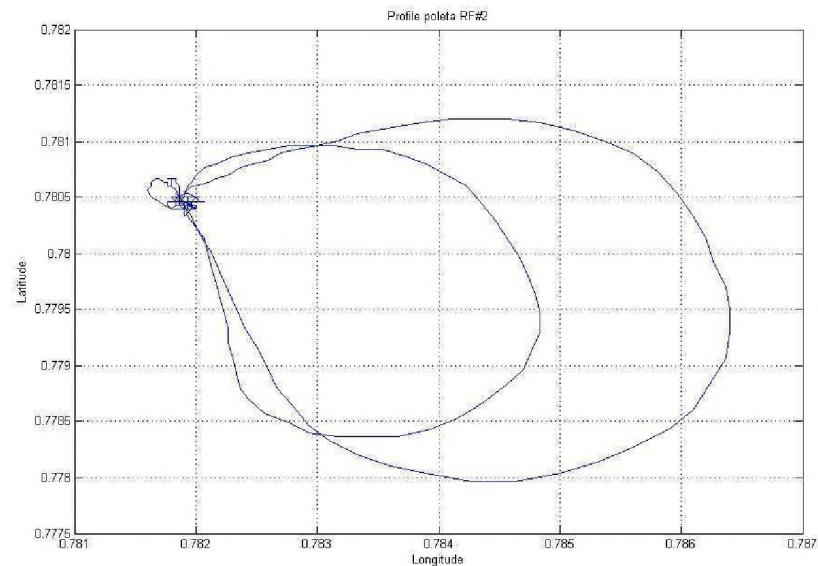


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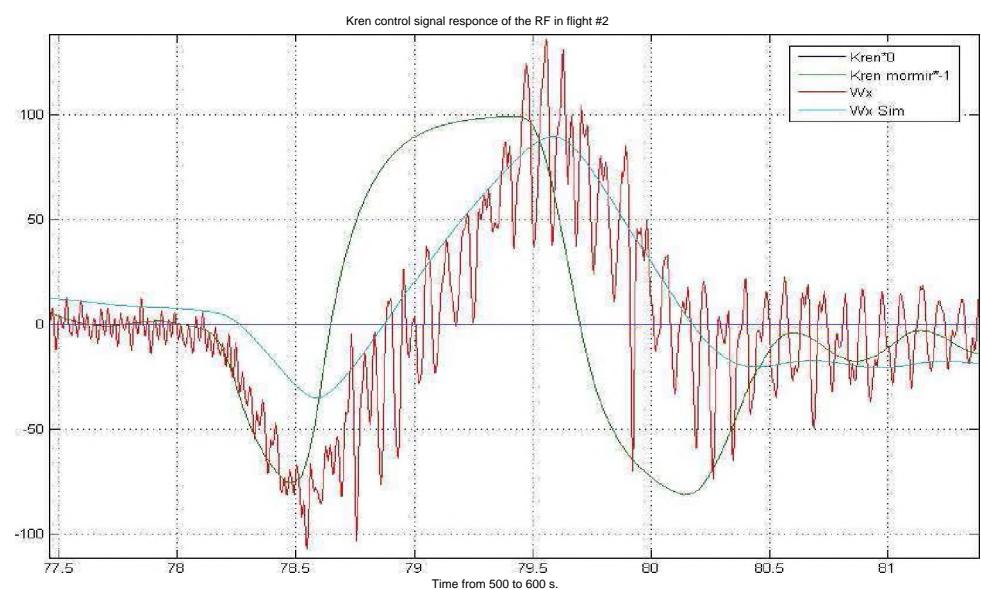
(Latitude)

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( . 5).



. 5.

^ , / )

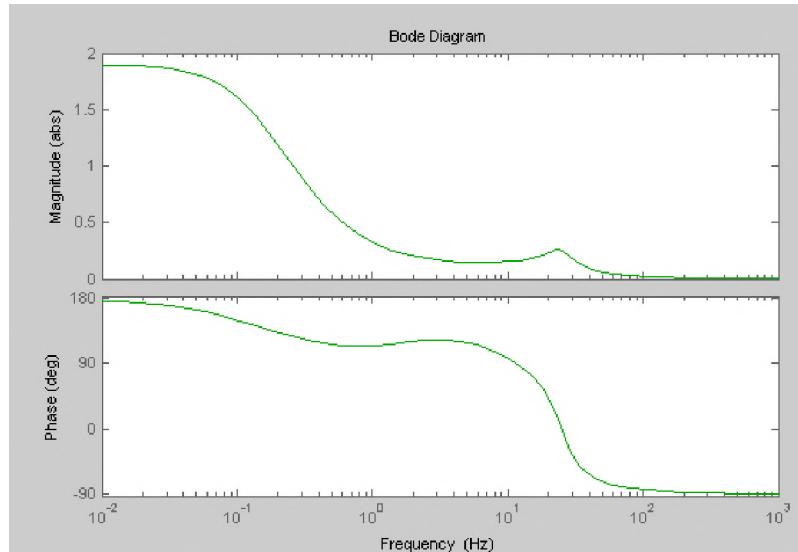
^ Sim, / ),

(Kren normir, %)

...

$$O(s) = \frac{13,03s^3 + 1308s^2 - 2,17}{s^4 + 157,2s^3 + 30520s^2 + 1,755} \cdot \frac{10^5 s - 3,274}{10^6 s + 1,723} \cdot \frac{10^6}{10^6} \quad (3)$$

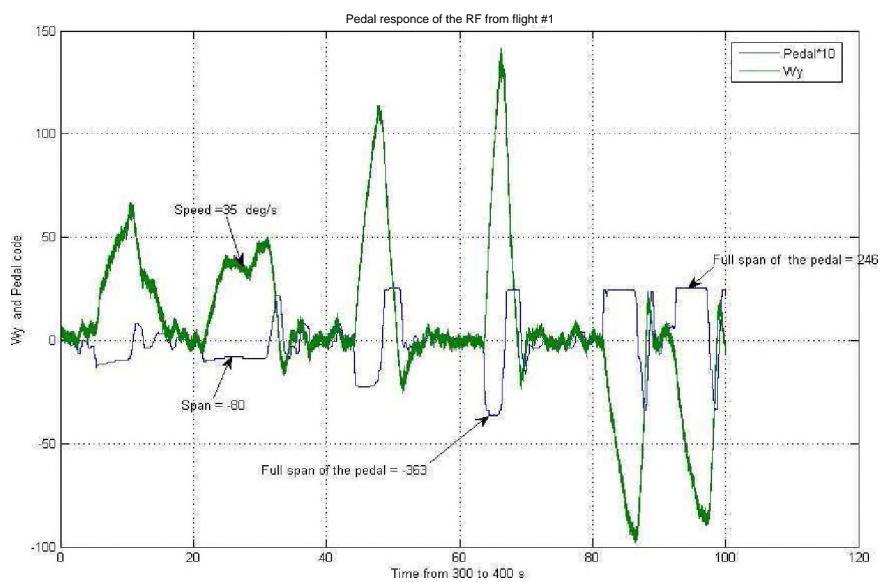
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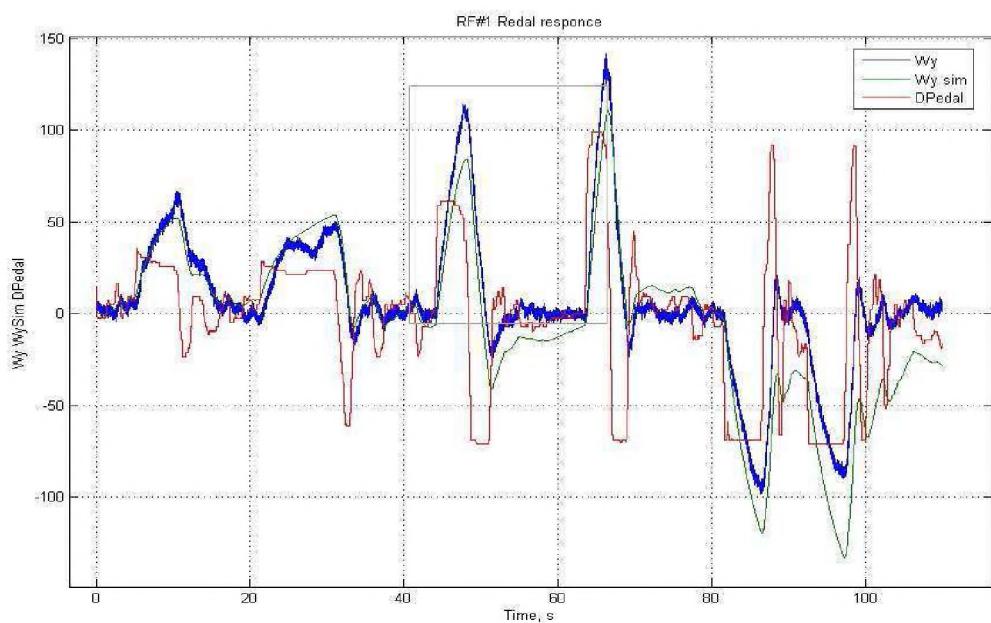
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. 7.

(Wy, / ).  
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. 8.



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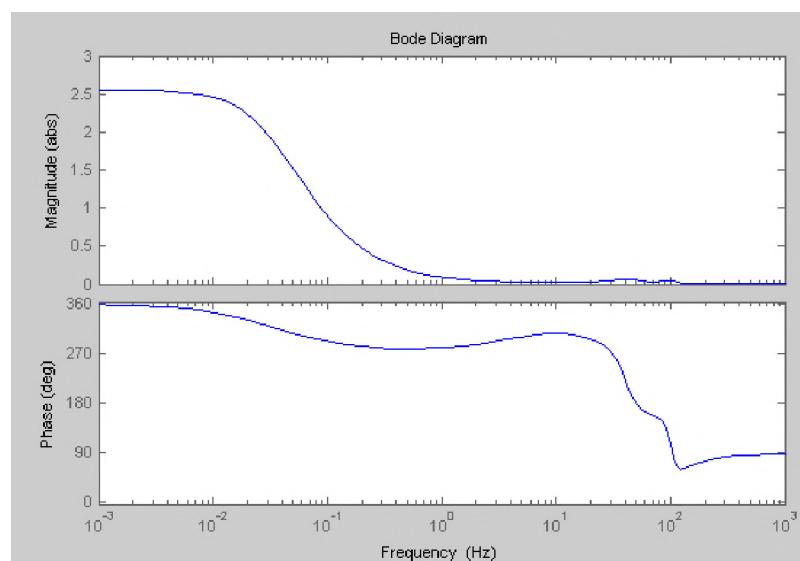
(Wy, / )  
 (Wy Sim, / ),  
 (Dpedal, %)

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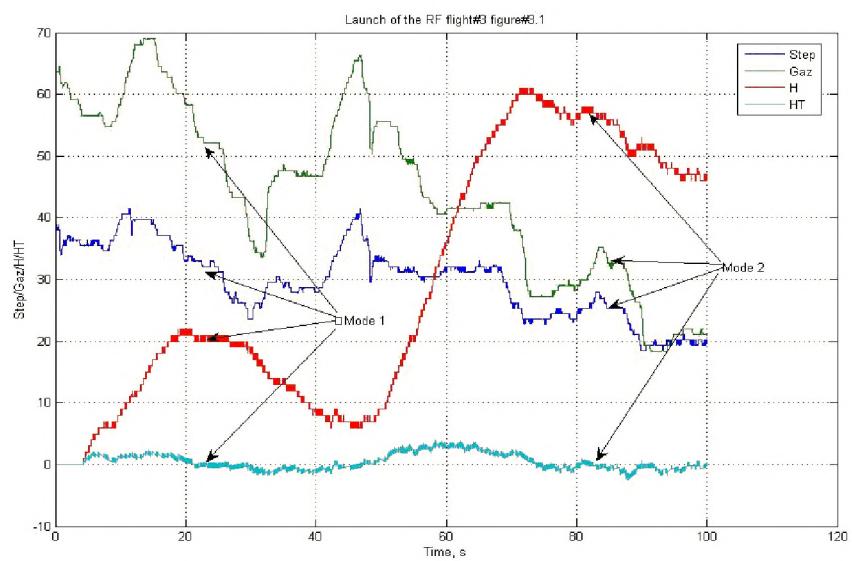
,

$$\begin{aligned}
 & 5,606s^4 - 2611s^3 & 2,248 & 10^6s^2 + 3,753 & 10^8s + 1,552 & 10^{10} \\
 & s^5 + 251,1s^4 + 4,8 & 10^5s^3 + 5,776 & 10^7s^2 + 2,61 & 10^{10}s + 6,082 & 10^9
 \end{aligned} \tag{4}$$

. 9.



. 9.



. 10. (mode 1, mode 2). (Step) (Gaz) % (HT) /c ,

**BUILDING OF SIMPLE MATHEMATICAL MODEL OF SPATIAL MOVING  
DYNAMICS OF ULTRA LIGHT COAXIAL HELICOPTER**

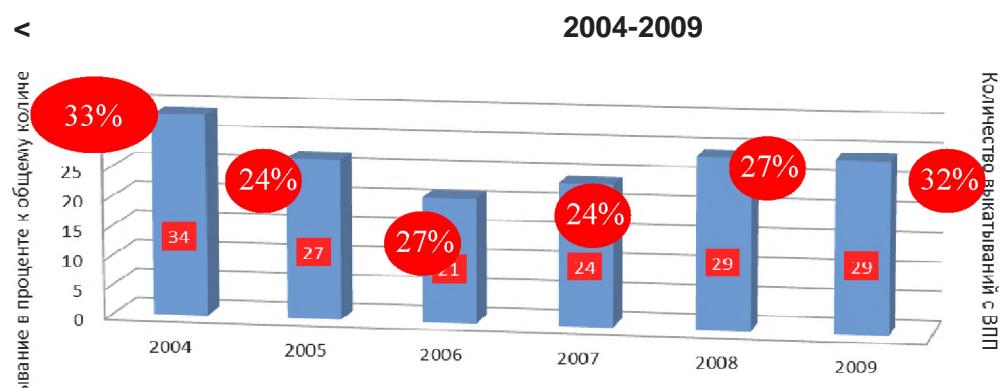
Dudnik V.V.

Article is devoted to receiving of advance approximation transmitting functions of ultra light coaxial helicopter of control in control channels of yaw, roll, pitch angles speed and also vertical speed during the hover and low speed

Key words: the helicopter of the coaxial scheme, the peak phase frequency characteristic.

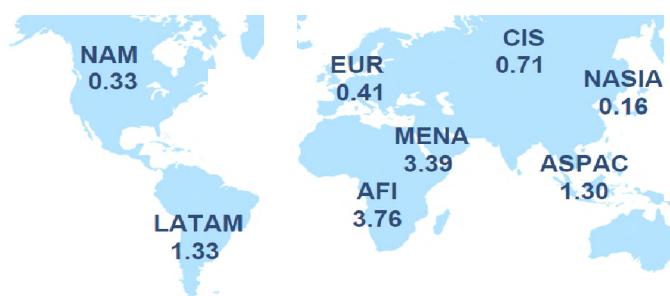
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. 1. 2004-2009 . 2.  
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2004^009



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09.07.2006

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Boeing 747

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(Doc. 9859),

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$$\min F(t).$$

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2009.

.., 2008. - 127. - . 24-31.

3. Rukhlinskiy V., Nekrasov V., Svirkin V. Certification of aerodrome and en-route equipment (EMAS) // Assembly - 37<sup>th</sup> Session, ICAO, Canada, Montreal, A37-WP/83, 28.

## SOME ASPECTS OF THE ENHANCING THE EFFECTIVENESS OF THE RESCUE OPERATIONS WITHIN THE TERMINAL AREA

Rukhlinskiy V.M., Svirkin V.A.

This article offers some aspects of the enhancing the accident rescue operations effectiveness based on the optimization of the operation process.

Key words: aspects of improving the efficiency, aircraft, liquidation of the fire.

, 1946 . ., (1973),  
, , 85  
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, 1987 . .,  
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656.7.081

1	02.03.2008	R-44	GPSMap 276C	
2	03.06.2008	-32 " "	GPS 76	
3	02.07.2008	Cessna 182	GPSMap 296	
4	10.09.2008	-2	GPS 72	
5	20.09.2008	-2	GPS 128	
6	03.11.2008	-1	GPSMap 295	
7	26.12.2008	AS 350	GPSMap 295	
8	09.01.2009	-171	GPSMap 296	
9	26.04.2009	-52	GPS Etrex Vista	
10	29.05.2009		GPS Etrex Venture	
11	15.06.2009	Cessna-150L	GPSmap 276C	
12	16.07.2009	-32 " "	GPSMap 276C	
13	14.08.2009	-2	GPS 128	
14	09.10.2009	-8	GPS 72	
15	26.10.2009	Bae-125-800B	GPSMap 296	
16	29.11.2009	Cessna 182	GPS Pilot 3	
17	13.12.2009	-92	GPSMap 276C	
18	10.03.2010	R-44	GPSMap 496	
19	11.03.2010	-8	GPSMap 295	
20	19.04.2010	AS-320	GPSMap 296	
21	12.06.2010	-32	GPSMap 296	
22	13.06.2010	L-44	GPSMap 296	
23	08.08.2010	MD-600	GPS 95	
24	02.10.2010	R-44	GPSMap 296	
25	05.11.2010		GARMIN GPS 96	
26	25.11.2010	-8	GPSMap 296	
27	08.04.2011	-20	GPS 72	

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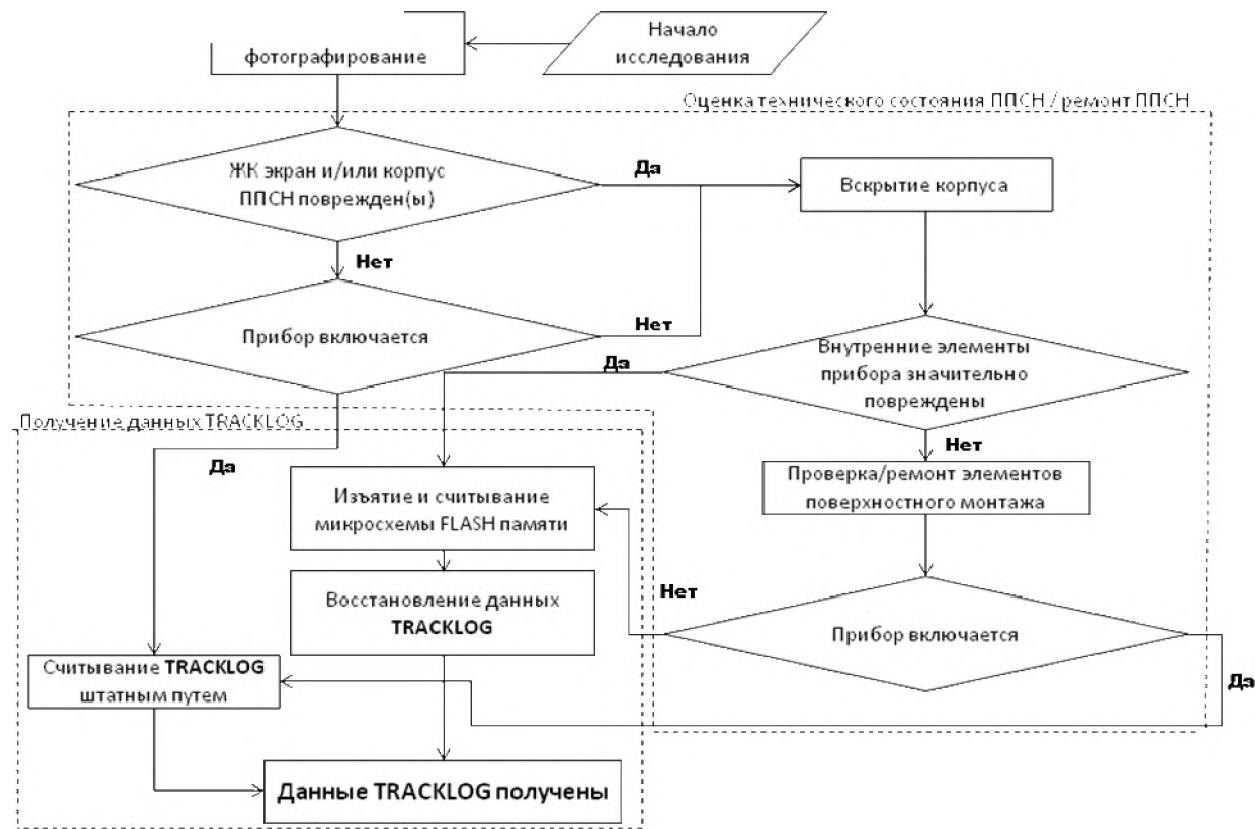
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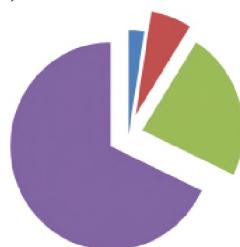
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Tracklog

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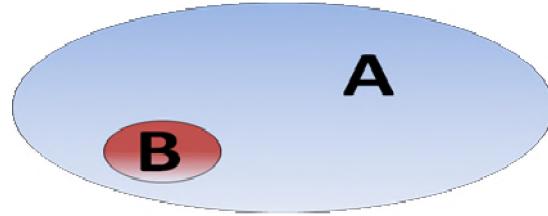
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TRACKLOG

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. 3. Tracklog  
 FLASH

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 b.  
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( 2. - L<sub>12</sub>, dL<sub>12</sub>, L<sub>I</sub> -  
 ; L<sub>2</sub> - ; dL<sub>I2</sub> - L<sub>12</sub>.

IT = IT (it<sub>1</sub>, it<sub>2</sub>, ..., it<sub>Nr</sub>, it<sub>N</sub>),

N<sub>T</sub> a<sub>t</sub>,  
 ) A , , ,  
 0 > ( - F<sub>t</sub> (a<sub>t</sub>) < dT, 1 < i < N<sub>A</sub>, N<sub>A</sub> - A ;  
 ) a<sub>i</sub> A , , ,  
 / , . . |F<sub>pk</sub> ( . ) - V<sub>k</sub> | < dV<sub>k</sub>, i - < j < i + ; k = 1, 2; = ( b B ).

, b B

F, . . . F -

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b B. A,  
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$$= \begin{vmatrix} "a_{it,-2} & "U_L-l & "a_{it_L,-2} & "'a_{it,-F}' \\ "a_{it,-F} & -\ll^2 & "a_{it_2,-2} & "'a_{it,-F} \\ "a_{itX_T,-F}' & "'a_{itf,T-L-2} & "'a_{itx_{T^*},-2}' & "'a_{itx_{T^*L}}-F' \\ "a_{it?;T^*2} & "'a_{itMr-i-i} & "a_{itn_T+2}' & "'a_{itx_T-F}. \\ "a_{itffr^1} & "a_{itC|^*_r+1} & "a_{itn_T+2}' & "'a_{itx_T-F}. \end{vmatrix}$$

C

$$c^j =$$

$$\star_{ij}$$

*I*,*I*

$$(C^j)-V \min,$$

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A

$$V_k \ k = 1,2 -$$

$$F_{pk} \ k = 1,2 -$$

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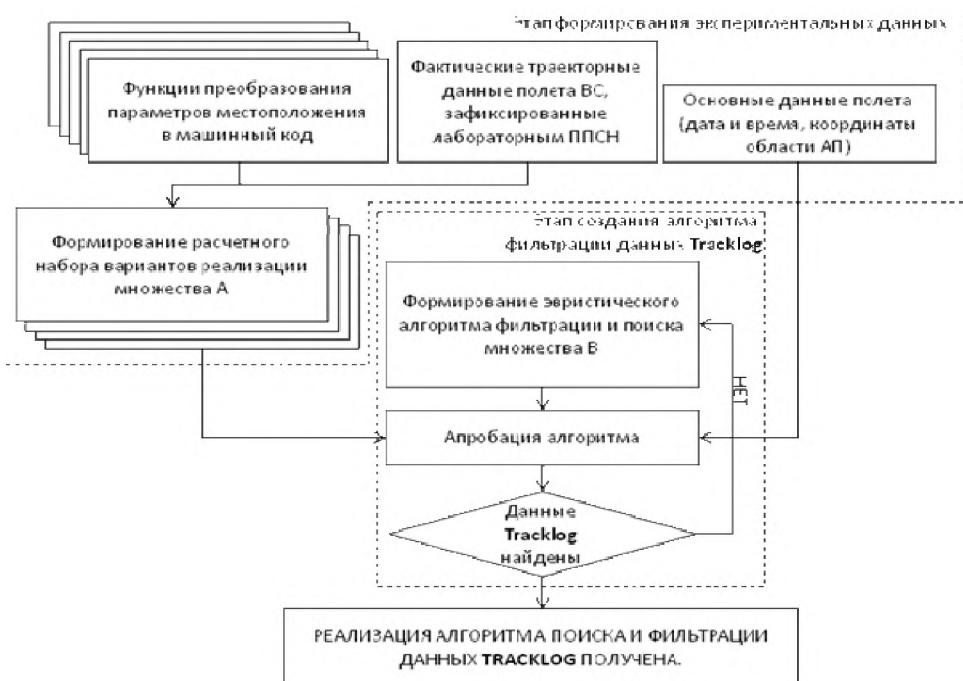
A,

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Tracklog

( . 1).



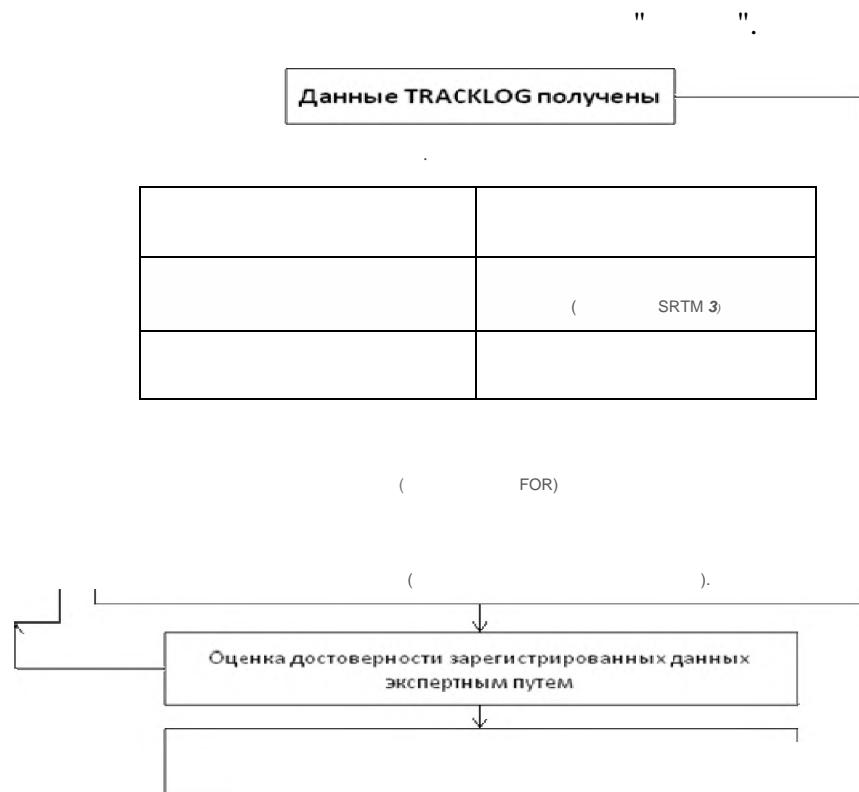
. 4.

[3],

## Tracklog

. 5.

Topography Mission), NASA SRTM3 (Shuttle Radar



.5.

GPS/

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1.  
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2. IRIG (International Recorder  
Investigator Group), ( ) 2008 ; 17-  
« »,  
3. « ( ) 2009 [2].  
»,  
4. 1- 2- (TCAS, TAWS . ).  
5. (SMS)

1. . , 1998.  
2. . // 21- . . . , 2009.  
3. «Gamin GPS decoding rules 2008»,  
, 2008.

## NEW METHODS OF THE RECOVERY AND ANALYSIS OF THE DATA FROM THE PORTABLE GPS RECEIVERS USED IN THE AIR ACCIDENT INVESTIGATION

Rukhlinskiy V.M., Dyachenko A.S.

This article is about new developments in recovery and usage of GPS data for accident investigations.

Key words: method, information, route of movement of the data.

- , 1946 . ., (1973),  
, , 85 ,  
, 1983 . ., (2006),  
(2003),  
6 , , ,

629.067

$$\begin{aligned}
 & T_j = P_j, \quad j = 1, 2, 3, \dots, N \\
 P = & \sum_{j=1}^N P_j, \quad 0 > 10^{-6}, \quad 1 \\
 P_j = & 10^{-n}, \quad j = 1, \dots, N. \quad (2)
 \end{aligned}$$

$$\begin{aligned}
 (1) \quad (2) \quad & P = 10^{-1} \sum_{j=1}^N n_j = 10. \quad (3)
 \end{aligned}$$

$$\begin{aligned}
 ) \quad , \quad & 0 \quad P_j, \quad \dots, \quad 0 \quad P_j, \quad \dots
 \end{aligned}$$

$$) \quad \begin{matrix} So \\ Sj \end{matrix} \quad \begin{matrix} Pj \end{matrix} \quad \begin{matrix} j- \\ nj \end{matrix} \quad - Sj.$$

So.

$N$ ,

$$\sum_{j=i}^N n_j = M.$$

$$( \quad ) \quad . \quad N \quad , \quad s = \sum_{j=1}^N S_j, \quad S \wedge \min. \\ , \quad , \quad , \quad S_j = S_j(nj).$$

$$\lim_{nj \rightarrow 0} Sj(nj) = \sim . \quad (4)$$

Sj (nj)

$$nj=0$$

$$Sj(n_j)$$

$$=1 \quad [fij^{\alpha})=Z \quad i=I^{+c+Z} C^{\alpha)n}$$

Cj -

$$c_{j+i}) \quad C_j$$

$$j^1 \gg w$$

q,

$$\begin{aligned} & \quad C L \\ & \quad (n j \ 1) \\ & \quad , \quad n j \end{aligned}$$

(6)

$$; \quad ' = tj, c_{qi} = a2$$

$$Sj \wedge ) = f,$$

$$\sum_{j=1}^N nj = M$$

$$\sum_{j=1}^N t_j = \sum_{j=1}^R a_j^2 \quad (9)$$

$$\begin{aligned} & \sum_{j=1}^N (t_j - a_j)^2 \\ & \text{for } j = 1, 2, \dots, R \\ & \text{and } S_0 = \sum_{j=1}^N a_j^2 \quad (10) \\ & \text{and } S_{min} = \sum_{j=1}^R a_j^2 \quad (N-1) \end{aligned}$$

$$S = \frac{\sum_{j=1}^R a_j^2}{R} \quad (11)$$

$$\begin{aligned} & \frac{dR}{dS} = 0, \quad j = 1, N-1, \\ & R = \sum_{j=1}^{N-1} a_j^2 \quad (12) \\ & \text{and } S_{min} = \sum_{j=1}^R a_j^2 \quad (12), \end{aligned}$$

$$\begin{aligned} & S_j = \frac{\sum_{i=1}^j a_i^2}{j} \quad j = (1..N). \\ & S_{min} = \sum_{j=1}^R a_j^2 \quad (11) \end{aligned}$$

$$S_{min} = \frac{\sum_{j=1}^R a_j^2}{R} \quad (13)$$

$$\begin{aligned} & R_{min} = \sum_{j=1}^R a_j^2 \quad (14) \\ & \text{and } S_{min} = \sum_{j=1}^R a_j^2 \quad (15) \end{aligned}$$

$$\begin{aligned} & \frac{dS}{dt} = 0, \quad j = 1, N-1, \\ & S_n = \frac{\sum_{j=1}^N a_j^2}{N} \quad (15) \\ & \text{and } S_{min} = \sum_{j=1}^R a_j^2 \quad (9), \end{aligned}$$

$$a_j = \frac{R}{N} \quad j = (1..N). \quad (16)$$

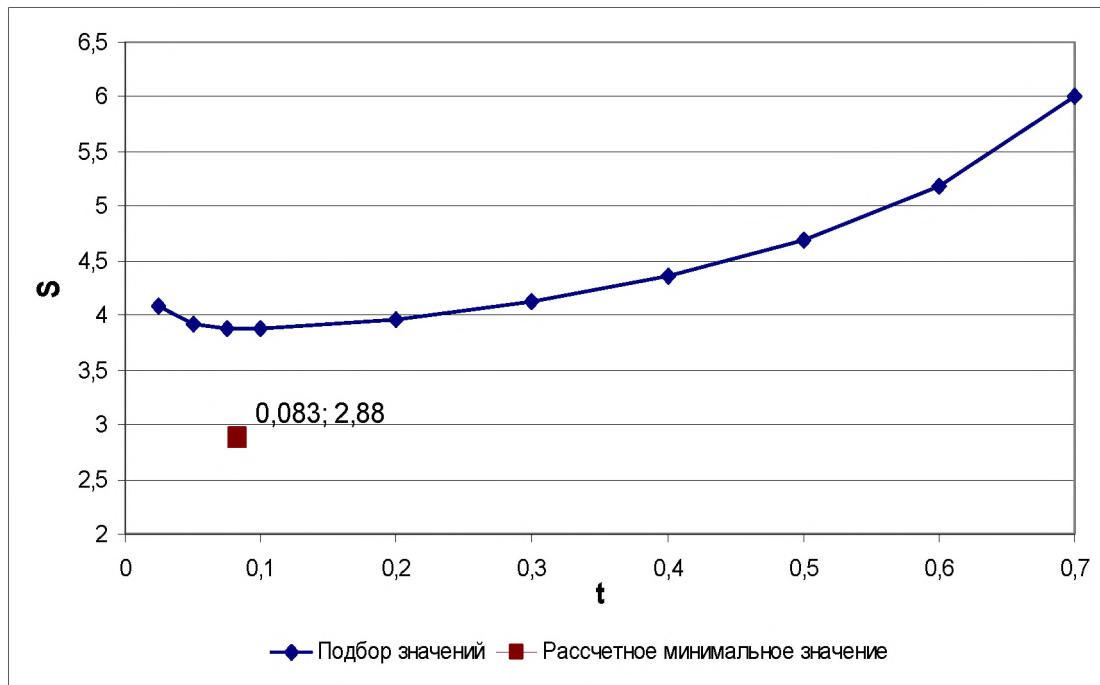
$$S_j = \frac{S_{Qmin}}{\sum_{j=1}^N \frac{a_j}{R}} \quad (8)$$

$$(1 \dots N) \quad (17)$$

$$S = \sum_{j=1}^N S_j = \sum_{j=1}^N \frac{a_j}{R} \quad (18)$$

$$R = 2. \quad t_1 = 0.083 \quad S = 3.87 \quad (9),$$

$$(18), \quad S_{0min} = 2.88.$$



1.

## DISTRIBUTION OF RELIABILITY RESOURCES IN COMPLEX SYSTEMS WITH FIXED COST

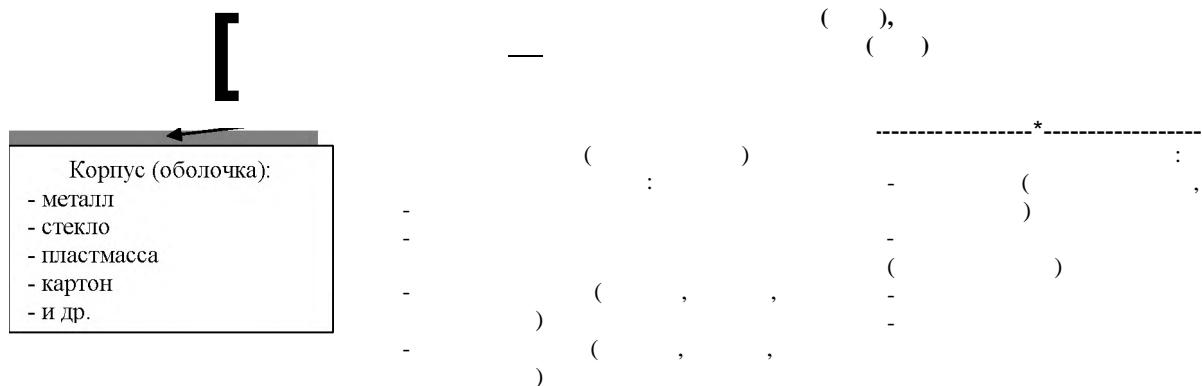
Rybalkina A.L.

The article is devoted to solving problems of optimizing costs of reliability in complex technical systems.  
Key words: resource, reliability of technical systems.

658/562:621.396:681.5

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Heimann, Rapiscan Schiumberger.

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 $a - b)$  .

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$$((\ ) = P^{(b)} = P^{(c)}) \& (\ t(\ a\ t(\ b\ ) \wedge t(c))) \wedge T(a\ , c), \\ p(a), p(b), p(c) - ; t(a) \sim t(b), t(c) - ; (\ , b\ , ) - .$$

$$((p(a) > p(b) > p(c)) \& (t(a) = t(b) = t(c))) \wedge T(a, b, c). \quad (2)$$

<sup>4</sup> See also the discussion of the relationship between the two concepts in the section on "The Concept of the State."

$$\frac{P(\underline{a})}{t(a)} > pip) > \frac{P(\underline{c})}{t(b) p(c)} \wedge T(a, b, c). \quad (3)$$

$$( \quad , \quad )$$

$$= p^{(a)} \bullet t(a) + (1 - p^{(a)}) \bullet p^{(b)} \bullet (t(a) + t(b)) + [1 - (p^{(a)} + (1 - p^{(a)}) \bullet p^{(b)})] \bullet t(a) + t(b) + t(c). \quad (4)$$

( ), ( ),..., t (a), t (b), ... p<sub>1</sub>, p<sub>2</sub>,..., p<sub>n</sub>, t<sub>1</sub>,

$$l_{2,\dots,t_n}; \quad (1 - p_1) \quad g_t \text{ (i=1, 2, ..., n).} \quad n$$

$$g_1 J_{\text{R}} \cdot 2(t_1 + 12) + g_1 \cdot g_2 \cdot g_3 (t_1 + 12 + t_3) +$$

$$+ [^{1\cdot}(p1 + g1 p 2 + ". + g1 g 2" .g n-2 p,, -1)](t1 + ^{12} + ". + ^tn) \quad (5)$$

[5].

1. . Doc 8973, . - . 7- , , 2008. - . II.
2. 25.07.2007. - 104.
3. . - 1998. - - - . 82-87. //
4. . - 1998. - - - . 49-54. //
5. . . . - .: , 1966.

## **OPTIMIZATION OF X-RAY PATTERN INTERPRETATION BY X-RAY TELEVISION EQUIPMENT OPERATOR ON THE BASE OF DISJUNCTIVE SEARCH STRATEGY**

Kurchavov V.V.

Procedure of prohibited articles and substances recognition due to their X-ray patterns on the base of disjunctive search is considered in the paper.

**Key words:** interpretation of the image, strategy, search.

, 1961 . . , (1993),  
( ), 9 , .

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ROM ( . , CD ROM, ). CD ROM. -

## Power Point,

DA-42;

DA-42.

## THE EXPERIMENT TO USE ELECTRONIC ALBUM SCHEMES FOR AIR SPECEALISTS TRAINING

Korneev V.M.

This article presents the experiment to use electrons albums schemes for air specialists training in civil aviation

Key words: electronic album, units, personnel, information material.

, 1951 . ., (1974),

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**TAWS**

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7.01.1989 .	-76		60°	3-5
3.04.1996 .	-737		40°	10 GPWS
28.08.1996 .	-154		50°	9
1995 .	-757		35°	9 GPWS
23.12.2003 .	-140		50°	7-10
1998 .	-42		30°	15-17
28.11.1979 .	10-30		30°	15 GPWS
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(FMS),

TAWS - terrain awareness and warning system

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TAWS :

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 - EGPWS -  
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 - T<sup>2</sup>CAS - ACSS ( ).

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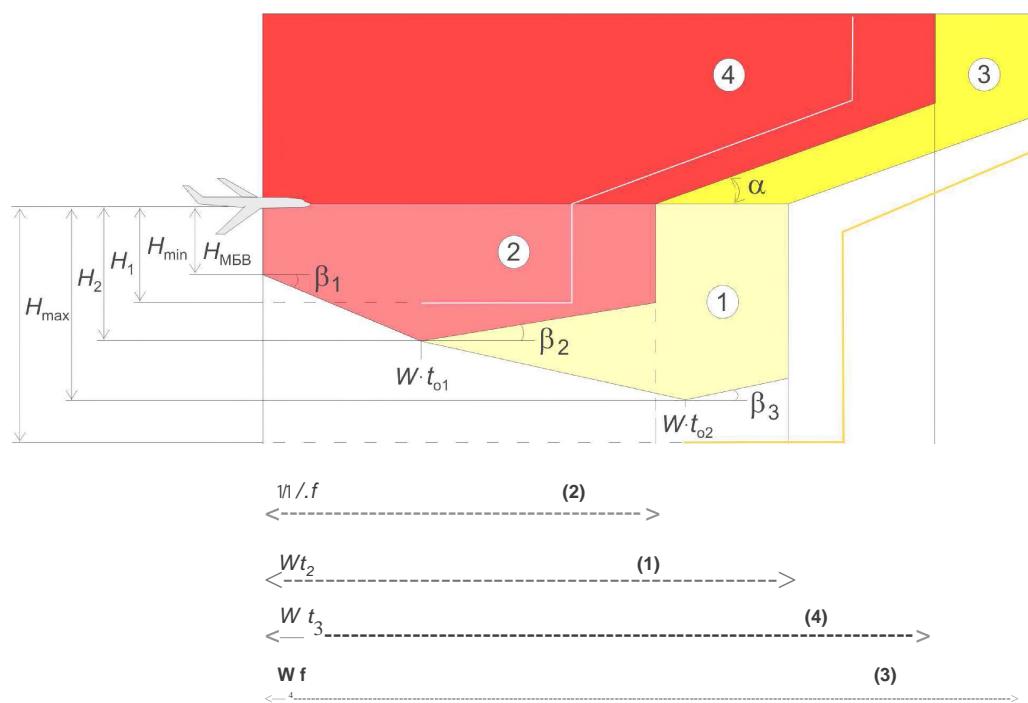
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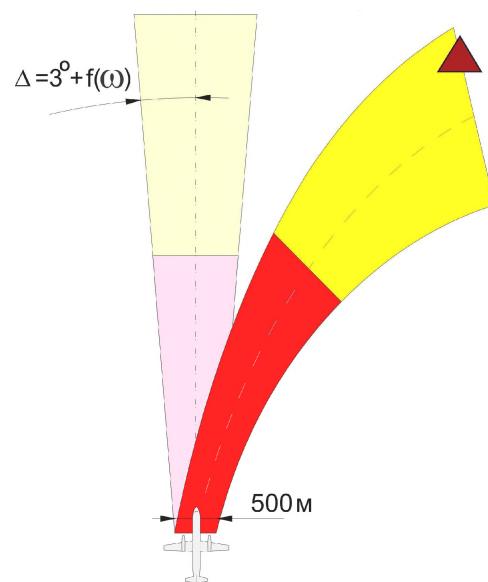
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ks	$ks = 6 ( )$ $kse (6, 12) -$
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Hmin	-
	$H_{min} = \begin{cases} 1 & Vy > -2,5 \\ 2 + I  V_y ^t D + 0,2 V_y & V_y \leq -2,5 \end{cases}$
Hmax	-
	$H_{max} = \begin{cases} V_y > -2,5 \\ + ks'1 V_y / V_y \leq -2,5 \end{cases}$
H1	-
2	-
Y	$= \arctg(V_y / W)$
	$= (10\%), 6^\circ$
	$_2 = = V_y > 0; 2 = = 0 V_y = 0$
Pb to1, to2	,
	$_1 = \arctg(2,5/W) V_y > -2,5 ;$
	$1 =  V_y  - 2,5 ;$
	$to1 = ( - ) /  V_y , tole(6, 20) ;$
	$to2 = ( 2 - ) /  V_y , to2e(7, 24)$

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## THE ANALYSIS OF TAWS SYSTEMS USE PROBLEMS IN ORDER OF INCREASING OF AIRCRAFT SAFETY LEVEL

Fedoseyeva G.A.

The article contains the information about the problems concerning the avoidance of midair-collisions with the obstacles on ground, the aims of creating such systems as TAWS, their improvement in order of increasing of the aircraft safety level, the peculiarities of their exploitation in flight.

**Key words:** safety, industry, system, digital system.

(1967),

( ), 35

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(MMEL-  
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CFM56

Boeing 737(300/400/500/800),  
(3B2, 3C-1).

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ISSUED:

DUE: TRANSFER ON:

73 - 34 S. Bespalov 213 11.12.2010 02228893

DESCRIP: PERFORM REPLACEMENT OF FUEL FILTER OF ENG # 2

MEL: FX

CODE

ACTION: FUEL FILTER (ENG # 2) P/N CH0697101552N00 WAS REPLACED IAW AMM 73-11-02/401. RESULT - OK. PFMD ENGINE START IAW AMM 71-00-00-800-811-100. RESULT - OK.

S. Bespalov Me 213 11.12.2010 02228893

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ISSUED:

DUE: TRANSFER ON:

71 - 0 CREW 213

21.02.2010

02332901

DESCRIP: ENG # 1 VIBRATION MAX 3/0 ON REACHING FL 380. DURING CRUISE AVERAGE 2.6.

MEL: FX

CODE

ACTION: MAX RECORDER VIBRATION LEVEL IS 2.9. VIBRATION IS IN LIMITS IAW AMM 71-00-00/201. RESULT - A/C RETURNED IN SERVICE CONDITION.

S. Platichkin Me 122

11.12.2010 02228893

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ISSUED: 25.12.2010

DUE: / TRANSFER ON:  
1223514

DESCRIP: REPLACE R/H ENGINE HIGH STAGE VALVE.

MEL: FX

COD

ACTIONX 'VALVE WAS REPLACED IAW AMM 36-11-06/401. RESULT - OK. OFF: P/N 3214446-4|S/N 7411. ON: P/N 3214446-4, S/N 577C. TAG # 96643.

S. Platichkin Me 122

25.12.2010 1223514

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CFM56-3B2 2009-2010 .

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1	Engine vibration		30
2	Engine high stage valve fault	-	14
3	Fuel filter contamination		16
4	Hoses and ducts failure	,	43
5	Reverse failure		28
6	APU bleed air valve failure		17
7	Leak into washers and ducts	,	76
8	Engine high tension burn out		14
9	Ignition element (ignition plug burn out)	( - )	24
10	Oil cooler failure		6

APU (auxiliary power unit) - ( ).

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CFMI CFM56-2, CFM56-5, CFM56-7.  
 Rolls Royce RB211, Trent 700, Trent 800.  
 Rolls Royce Olympus 593.  
 Pratt & Whitney PW2000, PW4000, JT8D, JT9D.

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JA(B) -

$$\begin{matrix} , \\ JA(B) \\ \wedge \end{matrix}$$

B

$$P(A_i) - i - ; n -$$

(1)

$$H(A/B) = H(AB) - H(B), \quad H(AB) - [4] \quad (AB); H(B) -$$

Ai

$$Ja, (\quad) = \sum_{j=1}^n I^{A_j} (\bullet) \cdot 1 - o(\quad) / p(b, \bullet) P(A, \bullet)], \quad (2)$$

$$J_A(B)$$

i-

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$\Delta_i$

8

$$iiBi) = \log p(Bi/A_i) / p(Bi) \quad (3)$$

J. [ ]

Ai

$${}^J A, {}^{(B)} = \sum_{j=1} t^P (B j l^A j) \bullet {}^J A_t {}^{(B)} j). \quad (4)$$

$$J_A(b,j)$$

$$J_a [ \quad ) - J_A ( b \mid j)$$

(2) ,

$$J_q(L) = 0.$$

Ai

$$P(A_i),$$

Bj

$$p(A_i/B_I),$$

Ai

$$JA_t[Bj] = \log p(U/Bj) / P(A_j)] \quad (5)$$

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1. . . . . : . . . . , 2007. - . 1-3  
2. . . . : . . . . - . . , 2003.  
3. . . . . - . . , 1978.  
4. . . ( ):  
- . . , 2007.

## THE ANALISYS OF METHODS ESTIMATION AIRWORTHINESS POWER PLANTS

Bolshov D.S.

The statistics of malfunction of power plants is considered, methods of diagnosing of engines, method of the ized estimation of a condition of technical systems, information estimation of systems.

Key words: airworthiness, safety of flights, failure/malfunction, the aviation technics, informtiveness, diagno

, 1987 . ., (2009), , -  
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## **SYSTEM ZERO TOLERANCE TO TERRORISTS-SUICIDE-BOMBERS AT ALL TRANSPORT AREAS**

Peresada S.V.

This article deals with some problems of integrated zero tolerance to possible acts of terrorists-suicide-bombers on organizational and technical level.

Key words: terrorism, terrorist-suicide-bomber, womens suicidal terrorism.

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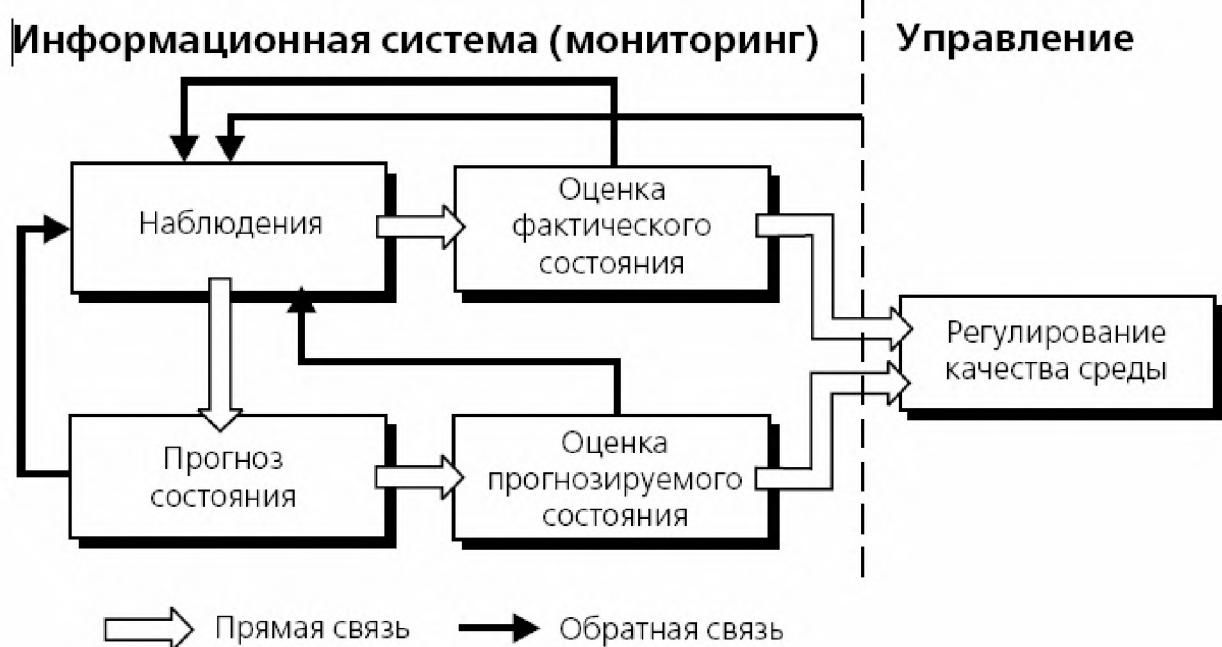


Рис. 1. Блок – схема системы мониторинга

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(ISO 9001, ISO 14001, ISO/IEC 27001, ISO 22000, ISO/IEC 20000 and OHSAS 18001).

( ) [Quality Management System (QMS)] -

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## **ABOUT THE PREPARATION CONDITION OF TECHNOGENIC-ECOLOGICAL SAFETY IN THE UNIVERSITIES**

Zhilinsky V.V., Shestakov V.Z.

The problems connected with preparation condition students of technogenic-ecological safety (TES) are discussed in this article. The article emphasize the importance for safety of an any enterprise, for Global safety of humanity, what it's worth for stability of development of the world community.

Key words: safety management, technogenic and ecological safety, educational programs.

629.735

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	1	1	8	20	100
	2	5	3	1	50000
	3	2	1	4	17000
	4	3	4	2	150000
	5	6	2	6	3000
	6	7	5	3	100000
	7	15	11	12	1300
	8	8	7	17	160
	9	4	15	8	
	10	11	9	5	2800
	11	10	6	18	195
	12	14	13	13	1100
	13	18	10	23	800
	14	13	23	26	
	15	22	12	29	30
	16	24	14	15	1000
	17	16	18	16	130
	18	19	19	9	14000
	19	30	17	10	3000
	20	9	22	11	150
	21	25	16	30	18
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	29	27	26	22	200
	30	29	27	25	10

1.  
», 2000.

## RANKING TASKS IN THE MANAGEMENT OF RECRUITMENT IN CIVIL AVIATION

Kovalev . ., Feoktistova O.G.

The paper presents a criterion for recruitment. This criterion is associated with a risk to aviation.

Key words: risk ranking, the airline.

, , (2009), , 3  
, , , , (1988), ,  
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$$0 = V_1 + V_2 + \dots + V_i + \dots + V_N = X V_i \quad (0^T i = 1 \quad N), \quad (1)$$

0 -

;  $V_i$  -  
i.

; N -

-

-

 $\xi_i = (V_i / 0) -$  $\xi_i$ 

$$l = X \xi_i \quad (i = 1 \quad N), \quad (2)$$

$$\xi_1 = f(af, bf, cf, \dots), \xi_2 = (a, b, c, \dots), \dots, \xi_n = (a_v, b_v, c_v, \dots), \quad (3)$$

$$1 = f(af, bf, cf, \dots) + (a, b, c, \dots) + \dots + (a_v, b_v, c_v, \dots). \quad (4)$$

ISO - 9001.

(2)

,

0: «

ISO-9001».

 $\xi_i = 1,$ 

$$1 = \xi_1 \& \xi_2 \& \dots \& \xi_i \& \dots \& \xi_{n-1} \& \xi_n, \quad (5)$$

); &amp; -

 $0 = 1 ($ ISO-9001),  $V \xi_i = 1.$ 

,

 $\xi_1 = 1 -$   
(5):

;

 $\xi_2 = 1 -$  $\xi_3 = 1 -$ 

;

 $\xi_4 = 1 -$  $\xi_5 = 1 - c$  $\xi_6 = 1 -$ 

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$\mathfrak{L}_7 = 1 -$

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$\mathfrak{L}_8 = 1 -$

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$\mathfrak{L}_9 = 1 -$

$\mathfrak{L}_{10} = 1 -$

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$\mathfrak{L}_{11} = 1 -$

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$\mathfrak{L}_{14} = 1 -$

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$\mathfrak{L}_{16} = 1 -$

$\mathfrak{L}_{17} = 1 -$

$\mathfrak{L}_{18} = 1 -$

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$f(a_f, b_f, c_f, \dots) -$

( , , , ..., )

$(a_y, b_y, c_y, \dots) -$

;

;

:  $f(af, bf, cf, \dots); ( , , , \dots); \dots, (ay, by, \dots)$

(5) ( , , , ..., )

$5af, f$

$5f,$

$F1 = f - 5f = f \{(af - 5af), bf, cf, \dots\}.$

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(6),

$(0 - 5v_1) = (v_1 - 5v_1) + V2 + \dots + Vi + \dots + v_n$

(7)

$(0 - 5v_1),$

(7)

(4)

$1 = f \{\Delta f - 5af, bf, cf, \dots\} + 1 + \dots + y_1.$

(4) (8),

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$5v_1$

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- 1.                    . . . . .                    , 1962.
- 2.                    . . . . .                    / . . . . .
- 3.                    // . . . . .                    3. - : , 2006.

## **OFFICE MANAGEMENT RECRUITMENT FOR THE CIVIL AVIATION ENTERPRISES**

**Kovalev . ., Feoktistova O.G.**

The paper presents the equation of the existence of the control system of management recruitment. The components of the system correspond to international standards of quality management ISO - 9001.

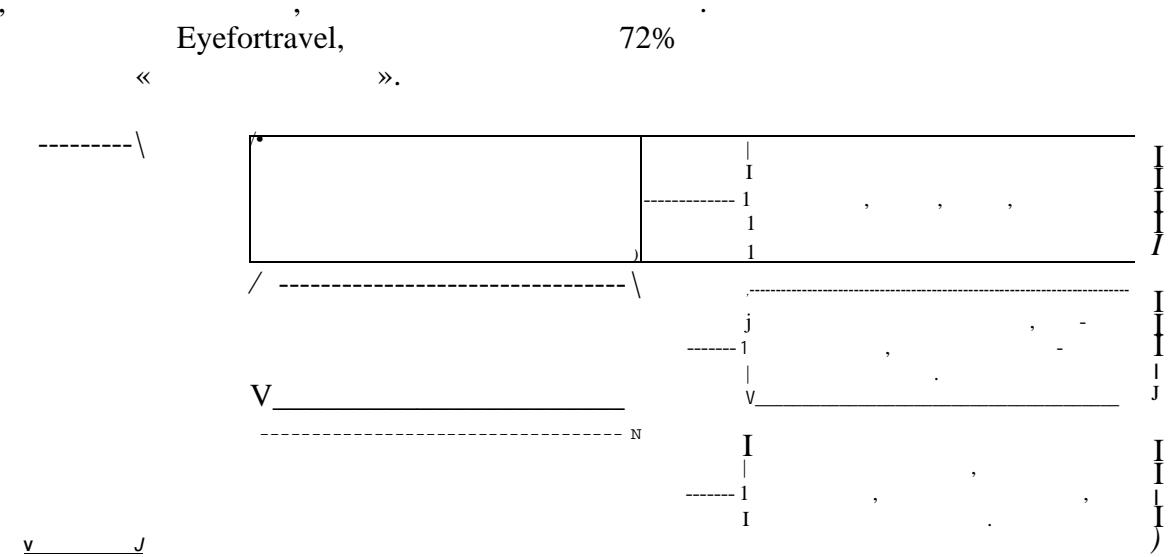
**Key words:** management, recruitment and quality.

- ,                    (2009),                    ,                    3
- ,                    ,                    ,
- ,                    ,                    (1988),                    ,
- ,                    90                    ,                    ,
- ,                    (                    ).

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Terrapinn, 113, 2008, IdeaWorks  
69%, - 40%

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IdeaWorks Terrapinn, 2008 .

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2		50%	65%
3		42%	72%
4		42%	51%
5		40%	49%
6		38%	79%
7	-	36%	55%
8		- 29%	55%
9		21%	33%
10		17%	46%

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## **ANCILLARY REVENUE OPPORTUNITIES OF AN AIRLINE IN CURRENT MARKET CONDITIONS**

Charychkina S.N.

In this article main trends of Russian and global air transportation market are defined, key indicators for airline performance improvement in current market environment are formulated, airline's product determination is given and classification is proposed, airline commercial policy features related to product development and pricing policy are described. Comparative analysis of ancillary services of major air carriers is made, taking into account international experience economic efficiency of ancillary service implementation on airline market position and product quality improvement is justified.

Key words: airline market, efficiency, competitiveness, airline products, ancillary revenue, pricing policies.

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