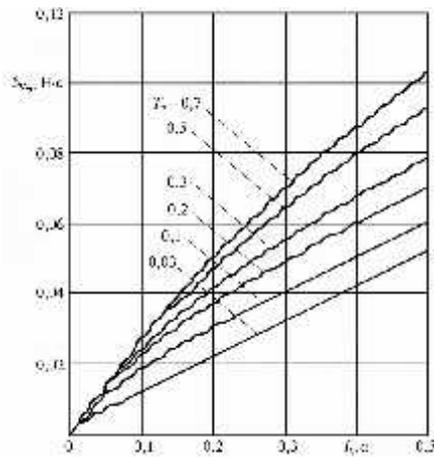


$$S^{(2)} = 0,2 \frac{l}{a} (I_0^{(2)})^2 \left(\frac{1}{2} t_k + \frac{1}{4} \sin 2 t_k - \frac{T_a}{2} \left(e^{-\frac{2t_k}{T_a}} - 1 \right) - \right. \\ \left. - 2 \frac{T_a}{1 + T_a^2} \left(1 + e^{-\frac{t_k}{T_a}} \right) \left(T_a \sin t_k - \cos t_k \right) \right), \quad (1)$$

a — , ; l — , ; $I_0^{(2)}$ — , ; t_k — , .



. I.

: S —

$$a = 1 ; l = 1 ; I = 1$$

$$S^{(2)} = 0,2 \frac{(I_0^{(2)})^2}{a} l(t_k + T_a). \quad (2)$$

$$v_k = \frac{S^{(2)}}{M}, \quad (3)$$

v_k —

, / ; M —

,

.

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10

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»

1,0...1,5 .

t_k :

$$1) \quad I = 13,1 ; t_k = 1,2$$

$$S = 0,2 \cdot \frac{13,1^2}{1,2} \cdot 80 \cdot (1,2 + 0,05) = 2860 \text{ . ;}$$

$$M = \quad + \quad + \quad + \quad = 1,62 \cdot 2 \cdot 80 + 2 \cdot 73,4 + 31 + \\ + 11 \cdot 0,93 = 452 \quad ;$$

$$v_k = \frac{2860}{452} = 6,3 \quad / ;$$

2) $I = 13,1 \quad ; t_k = 0,5$

$$S = 0,2 \cdot \frac{13,1^2}{1,2} \cdot 80 \cdot (0,5 + 0,05) = 1260 \quad ; v_k = \frac{1260}{452} = 2,8 \quad / ;$$

3) $I = 10 \quad ; t_k = 0,5$

$$S = 0,2 \cdot \frac{10^2}{1,2} \cdot 80 \cdot (0,5 + 0,05) = 733 \quad ; v_k = \frac{733}{452} = 1,6 \quad / ;$$

$$f_0 = \frac{P}{8} \frac{l^2}{o} = \frac{3,24 \cdot 80^2}{8 \cdot 1300} \approx 2,0 \quad (\quad) .$$

$$, \quad 10 \dots 15 \quad t_k = 0,5 \dots 1,2$$

$$, \quad , \quad : \quad y_k$$

$$y = \frac{1}{2} (a - a_{\min} - a) = \frac{1}{2} \cdot (1,2 - 0,15 - 0,4) = 0,325 \quad ,$$

$$a_{\min} = 0,15 \quad -$$

$$U = 10 \quad ; a = 0,4 \quad -$$

$$y_k$$

$$y_k = f_0 (1 - \cos \alpha_k) = 2,0 \cdot (0,08 \dots 1,0) = 0,16 \dots 2,0 \quad , \quad (4)$$

$$\alpha_k = \frac{v_k t_k}{f_0} = \frac{(1,6 \dots 6,3)}{2,0} \cdot (0,5 \dots 1,2) = 0,4 \dots 3,8 .$$

$$, \quad y_k \quad -$$

$$, \quad -$$

$$, \quad -$$

$$f_{01} = 0,6 \quad , \quad -$$

$$y_{\max} \quad -$$

$$y = 0,325 \quad .$$

$$f_{02} = \frac{3,24 \cdot 26,7^2}{8 \cdot 1300} = 0,22 \quad .$$

$$y_{\max} = (1,25 \dots 1,3) f_0 = (1,25 \dots 1,3) \cdot 0,22 = 0,27 \dots 0,29 \quad , \quad y \quad . \quad [6],$$

(
 «
 »

V- 10 .

;
 ;

$$\bar{T}_i = T \frac{d\bar{R}_i}{dS}, \quad (5)$$

\bar{R}_i -
 10 ; T - ; S -

50 100 ,

$$\frac{\partial T}{\partial S} \frac{\partial \bar{R}}{\partial S} + T \frac{\partial^2 \bar{R}}{\partial S^2} + \bar{F} + \bar{P} = \rho \frac{\partial^2 \bar{R}}{\partial t^2}, \quad (6)$$

\bar{F} -
 , / ; ρ - 1 .

\bar{T}_i

[6]:

$$M_s \frac{d^2 \bar{R}_{ci}}{dt^2} + f' \frac{d\bar{R}_{ci}}{dt} = \sum_{j=1}^m \bar{F}_{ijc} + \bar{P}_s; \quad (7)$$

$$M_c \frac{d^2 \bar{R}_{ij}}{dt^2} + f' \frac{d\bar{R}_{ij}}{dt} = \bar{T}_{ij1} + \bar{T}_{ij2} + \bar{F}_{ij} + \bar{F}'_{ij} + \bar{F}'_{ijc} + \bar{P}_c,$$

$$j = 1, \dots, m; \quad i = 1, \dots, n,$$

$$\bar{F}_{ij} = -\bar{F}'_{ij} - \dots, \quad j- \quad (j+1)-$$

$$i- \quad (j+1=m+1 \quad (j+1) \quad 1); \bar{F}_{ijc} = -\bar{F}'_{ijc} -$$

$$\dots; f' - -$$

$$\dots; M_s, P_s -$$

$$\dots; M_c, P_c -$$

$$\dots$$

$$\bar{F}_{ij} = F_{ij} \bar{k}_{ij}; \quad \bar{F}_{ijc} = F_{ijc} \bar{k}_{ijc}, \quad (8)$$

$$\bar{k}_{ij}, \bar{k}_{ijc} -$$

$$xyz.$$

$$\bar{k}_{ij} \quad \bar{k}_{ijc} -$$

$$\dots$$

$$\bar{k}_{ij} = \frac{\bar{R}_{i,j+1} - \bar{R}_{ij}}{|\bar{R}_{i,j+1} - \bar{R}_{ij}|}, \quad j = 1, \dots, (m-1)$$

$$\bar{k}_{im} = \frac{\bar{R}_{i1} - \bar{R}_{im}}{|\bar{R}_{i1} - \bar{R}_{im}|}; \quad \bar{k}_{ijc} = \frac{\bar{R}_{ci} - \bar{R}_{ij}}{|\bar{R}_{ci} - \bar{R}_{ij}|}, \quad j = 1, \dots, m.$$

$$(9)$$

V-

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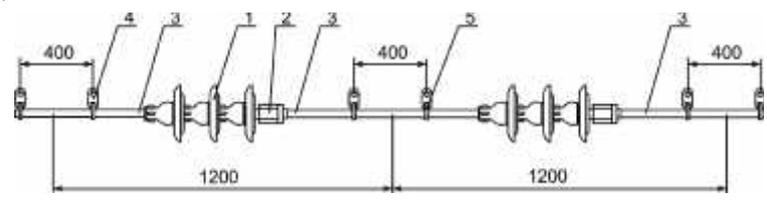
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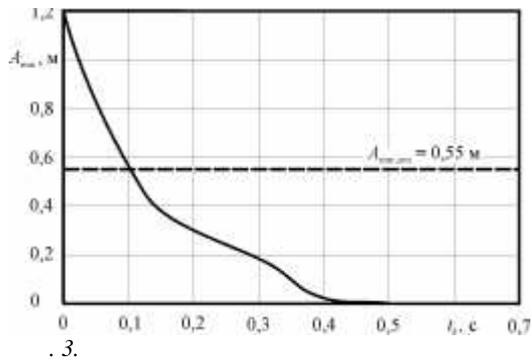
(. 2)

« »

13,13 8,4 .

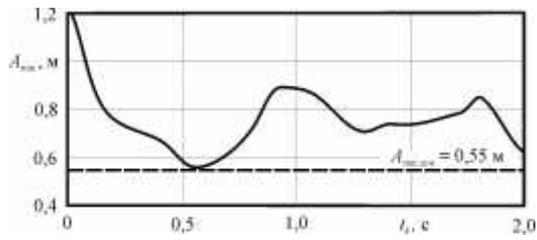


. 2. : 1 - ; 2 - ; 3 - ; 4 - ; 5 - ;



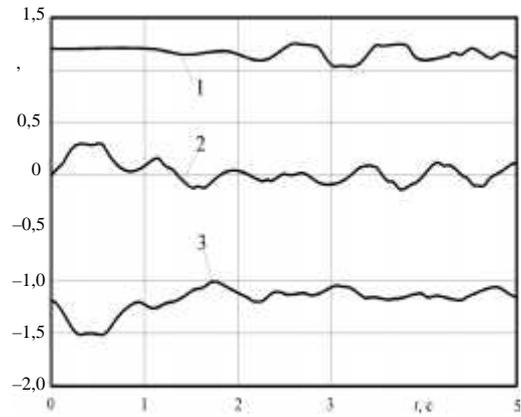
. 3.

$A_{\min} \quad t_k$
: $I_k^{(2)}=13,13$



. 4.

$A_{\min} \quad t_k$
: $I_k^{(2)}=13,13$



. 5.

: 1 - ; 2 -
; 3 - ; $m = 2$; $I_k^{(2)} = 13,13$; $t_k = 1$

80 .
13,13

0,1 (. 3).

1/3 2/3

$t_k = 1,0$
0,315 (. 4).

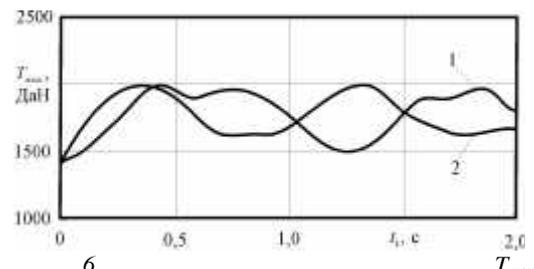
(. 5),

(. 6, 7).

$(t_k) \quad m = 2$ (. 4)

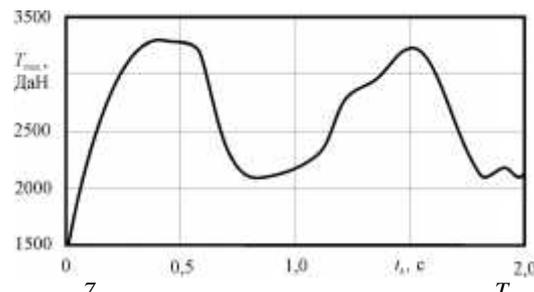
$t_k \quad 0,1 \quad 2,0$

8,4
(. 8).



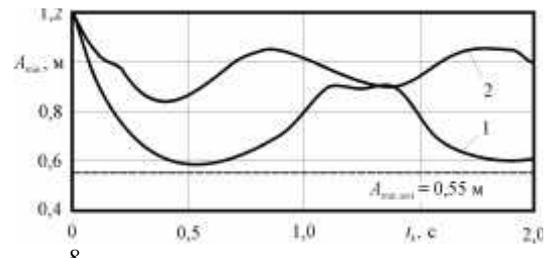
. 6. T_{\max}
: $I_k^{(2)} = 8,4$; $1 - m = 1$;
 $2 - m = 2$

(. 6).



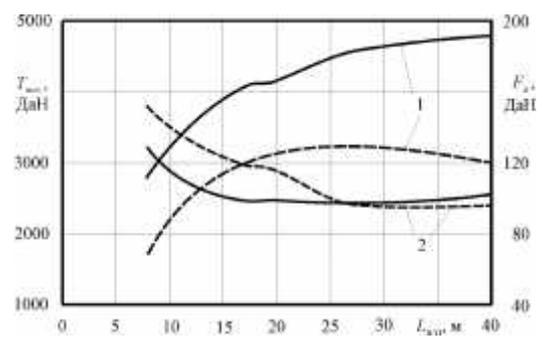
. 7. T_{\max}
: $m = 2$; $I_k^{(2)} = 13,13$

[7].



. 8. A_{\min} t_k
: $I_k^{(2)} = 8,4$; $1 - m = 1$; $2 - m = 2$

0,4 0,12 .



. 9.
: 1 - $0,12$; 2 - $0,4$;

0,12

-110 .

0,93

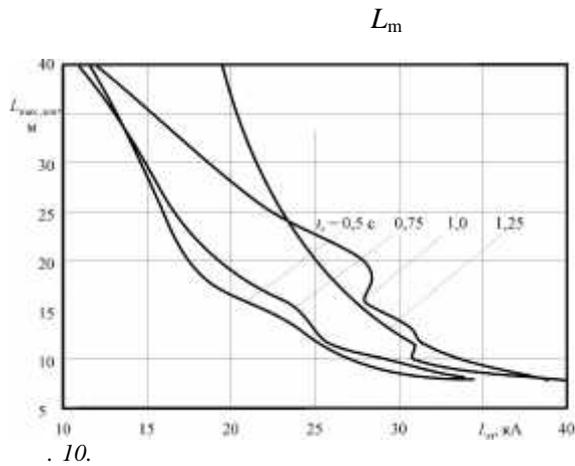
0,65 .

13,13

$t_k = 0,2$ (. 3).

4).

BUSEF-SPACER



L_m

I

[8].

1.

6-10

2.

1. The mechanical effects of short-circuit currents on air substations (rigid or flexible bus-bars). Brochure from CIGRE. SC 23. - Paris, 1996.

2. 50254-92.

3. 30323-95, 1993. - 57.

4. 1999. - 57.

5. 1987. - 648.

6. 2004. - 4. - 5-9.

7. Graig D. B., Ford G. L. The response of strain bus to short-circuit currents // IEE Trans. Power Appar and Syst. - 1980. - 99, 2. - P. 434-442.

8. 20-24. 2003. - 1-5.