Concerning an Optimum Method of Pulse Time Temporary Location

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SOV/109-5-[illegible]/24

$$\Delta\tau_c = \left(1 - \sqrt{\tfrac{2}{3}}\right)^{\frac{1}{2}} p \sqrt{T_f T_c}\, \frac{1}{\sqrt{n}}, \qquad (25)$$

where $p = \sqrt{2}\sqrt{N_0 \Delta f_0} / U_{mco}$ is ratio noise-to-signal at matched filter output. It should be noted that $p = \sqrt{N_0 E}$ where E is signal power. At higher level of noise multi-valued solutions will result due to the appearance of noise flares. This is also a reason for keeping a low permissible noise limit. The limit of noise-to-signal ratio is a function of the selected section 2T (Fig. 3) and number n of signal pulses counted. The noise flares appear when $T \geqslant T_c$. For $T = T_c$ the ratio noise-to-signal limit value is maximum, which can be considered only conditionally. While detecting a single pulse, however, the limit value is very close to one. For $T > T_c$ for optimum filtration:

$$p_{lim} = 0{,}7\sqrt{2 - \frac{T_c}{T}}\sqrt[4]{\frac{T_c}{T_f}}\sqrt{n}. \qquad (31)$$

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which is valid as long as the calculated $p_{lim} \geqslant 1$.

Determining the pulse location by the location of the maximum (Fig. 3), the error for low noise level is given by (24), and the limit of noise-to-signal ratio by ( ), if the filter before the detector is realized as a matched optimum filter. When signals having $T_c < T_f$ are filtered through an ordinary bandfilter with a band width $\Delta f_0 \simeq 1/T_c$, only the maximum limit noise-stability can be realized. The author concludes that there is one more method to achieve limit accuracy. This is measuring at a point lying on the middle of a section between the intersection of the limit level with the fronts of signal pulses (Fig. 3, point t_0). If the passband of the filter before the detector is equal $\Delta f_0 = 1/T_c$, the error will be only a few % higher than its limit value. However, the greatest limit noise stability can be achieved only for signals with $T_f \simeq T_c$. For such signals all the methods described here give approximately the same results. There are 3 figures; 1 table; and 8 Soviet references.

SUBMITTED: March 4, 1959

Card 14/14

26429
S/106/60/000/005/003/004
A055/A133

9,3230 (1013, 1040)

AUTHOR: Mityashev, B. N.

TITLE: Low-frequency noise spectrum at the output of limiters

PERIODICAL: Elektrosvyaz', no. 5, 1960, 17-21

TEXT: The thor analyzes the low-frequency noises at the output of unilateral or bilateral limiters i.e. noises that have passed through the h-f amplifier and through the limiter; he calculates the dependence of the correlation coefficient and of the effective spectrum width of the h-f component of the output noises upon the limiting level. He begins by examining the case of a unilateral limiter and assumes that a stationary noise is applied to the input of this limiter whose probability distribution density is

$$W(x) = \frac{1}{\sqrt{2\tilde{\imath}}} e^{-\frac{x^2}{2}} \qquad (1)$$

where $x = u/\sigma_0$ is the relative noise voltage. The instantaneous voltage at the limiter output is:

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Low-frequency noise spectrum ...

$$u_{lim} = f(u) = f(\sigma_o x) = \begin{cases} u, & (x > x_o) \\ 0, & (x < x_o) \end{cases} . \qquad (2)$$

where $x_o = u_o/\sigma_o$ is the relative limiting level. The fluctuation dispersion at the limiter output is:

$$\sigma^2_{lim} = \sigma^2_o [x^2_o + 2x_o W(x_o) + 1][0.5 - \Phi(x_o)] - x^2_o [0.5 - \Phi(x_o)]^2 - x_o W(x_o) - W^2(x_o) . \qquad (3)$$

where

$$\Phi(x_o) = \frac{1}{\sqrt{2\pi}} \int_0^{x_o} e^{-\frac{x^2}{2}} dx.$$

If the noise at the limiter input has already passed through a filter with resonant frequency ω_o, and has a correlation coefficient in the form of $R(\tau) = \rho(\tau) \cos \omega_o \tau$, the output voltage correlation function is:

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Low-frequency noise spectrum ...

or

$$C_n = \frac{\sigma_o}{n! \sqrt{2\pi}} H_{n-2}(x_o)\, e^{-\frac{x_o^2}{2}}. \qquad (7)$$

The 1-f components of the output noise are determined by the terms of the series (4) containing even powers of $\cos \omega_o \tau$. Using the first term of the development:

$$\cos^{2k} x = \frac{(2k)!}{k!\, k!\, 2^{2k}} + \frac{(2k)!}{2^{2k-1}} \sum_{m=0}^{k-1} \frac{\cos 2(k-m)x}{m!\,(2k-m)!},$$

the author obtains the following expression for the correlation function of the 1-f component of the output noise:

$$\psi_o(\tau) = \sigma_o^2 \frac{1}{2\pi} e^{-x_o^2} \sum_{k=1}^{\infty} \frac{H_{2k-2}^2(x_o)}{k!\, k!\, 2^{2k}} \rho^{2k}(\tau). \qquad (8)$$

The correlation coefficient of this component is:

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Low-frequency noise spectrum ...

$$r_o(\tilde{\tau}) = \frac{\psi_o(\tilde{\tau})}{\psi_o(o)} = \sum_{k=1}^{\infty} a_{2k}\, \rho^{2k}(\tilde{\tau}). \qquad (9)$$

where

$$a_{2k} = \frac{H^2_{2k-2}(x_o)}{k!\,k!\,2^{2k}\sum_{m=1}^{\infty}\frac{H^2_{2m-2}(x_o)}{m!\,m!\,2^{2m}}}.$$

Formulae (8) and (6) show how $\psi_o(\tilde{\tau})$ varies with the limiting level x_o. Practical calculations and the resulting graphs showed that for $x_o \leq 2$, the term containing $\rho^2(\tilde{\tau})$ is preponderant; with a further increase of x_o, the noise spectrum widens, and terms with $\rho^4(\tilde{\tau})$, $\rho^6(\tilde{\tau})$ etc. become preponderant. The effective spectrum-width of the considered fluctuations, as derived from (4), is:

$$\Delta F_o = \frac{1}{4\int_o^{\infty} r_o(\tilde{\tau})\, d\tilde{\tau}}. \qquad (10)$$

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Low frequency noise spectrum ...

On the basis of (9) and (10):

$$\frac{1}{\Delta F_o} = \sum_{k=1}^{\infty} \frac{a_{2k}}{(\Delta F_o)_{2k}} . \qquad (11)$$

where

$$(\Delta F_o)_{2k} = \frac{1}{4 \int_0^{\infty} \rho^{2k} (\tau)\, d} \qquad (12)$$

is the effective spectrum width of the k-th component. Numerical calculations and graphs based on these formulae led to the following conclusions: 1) If the limiter is preceded by an ideal band filter, the smallest spectrum width is obtained at x_o about equal to one; for $x_o = 0 \div 2$, the dependence of ΔF_o on the limiting level can be neglected. 2) If the limiter is preceded by a filter with a bell-shaped frequency response, the dependence of the spectrum width on the limiting level is but little influenced by the form of the filter frequency response. 3) If the limiter is preceded by a single-circuit filter, the increase of the limiting level brings about a more rapid increase of the spectrum

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Low frequency noise spectrum ...

width than in the case of the two already mentioned filters. The author then investigates the case of the bilateral limiter. The corresponding formulae are here:

$$u_{lim} = f(\zeta) = f(\delta, x) = \begin{cases} A_o, & (x > x_o) \\ 0, & (x < x_o) \end{cases} \quad (14)$$

$$\sigma^2_{lim} = A_o^2 [0.5 - \Phi(x_o)][0.5 + \Phi(x_o)]. \quad (15)$$

$$\psi_o(\tau) = A_o^2 \frac{1}{2\pi} e^{-x_o^2} \sum_{k=1}^{\infty} \frac{H^2_{2k-1}(x_o)}{k!\, k!\, 2^{2k}} \rho^{2k}(\tau). \quad (16)$$

$$a_{2k} = \frac{H^2_{2k-1}(x_o)}{k!\, k!\, 2^{2k} \sum_{m=1}^{\infty} \frac{H^2_{2m-1}(x_o)}{m!\, m!\, 2^{2m}}} \quad (17)$$

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Low frequency noise spectrum ...

Numerical calculations and the resulting graphs showed here that, in contrast to the case of the unilateral limiter, the fluctuation spectrum widens rapidly when the limiting level x_o decreases. There are 6 figures and 5 references, 4 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: Thomson. "The response of a non-linear system to random noise." Proc. IEE., part C, v. 102, no. 1, 1955.

SUBMITTED: January 6-th, 1960

[Abstracter's note: The subscript is translated in the abstract: "lim" (limiter) stands for the Russian "огр".]

Card 8/8

82068 S/108/60/015/07/06/010
B019/B060

6.4400

AUTHOR: Mityashev, B. N., Member of the Society

TITLE: A Method of Preventing Image and Combination Interferences in a Superheterodyne Receiver

PERIODICAL: Radiotekhnika, 1960, Vol. 15, No. 7, pp. 42-43

TEXT: The present paper describes a method of preventing image and combination interferences in superheterodyne receivers, thus improving the receiver circuit. If the reception of a signal of the frequency f_r is accompanied by an image interference f_i, the intermediate frequency f_{if} and the frequency of the heterodyne f_h change at the same time by a certain quantity Δf_r. The intermediate frequency of the receiver changes by the same amount, the frequency of the image channels changes by $2\Delta f_r$. It is suggested that the change in the frequency Δf_r be selected in such a way that the new frequency of the image channel does not occur in the mixer. The method described may also be used to prevent

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combination interferences. Further, the experimental verification of the method is described. A special property of the receiver based on the principle described is discussed. This concerns the shortwave image-frequency reception which gives the possibility of carrying out reception exclusively by the main channel. There are 1 figure and 1 Soviet reference.

SUBMITTED: January 28, 1959

Card 2/2

22255

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6.4700
6.4400

AUTHOR: Mityashev, B.N.

TITLE: On the interference [illegible] pulse signal reception

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 5, [illegible], 806 - [illegible]

TEXT: In order to avoid the need for optimal high frequency filtration in the reception of weak pulse signals, a quadrature scheme of reception has been lately adopted. In such a receiver as shown by V.C. Zubakov (Ref. 1: Optimal'nyye sinkhronizhennyye pri korrelirovannykh pomekhakh, Radiotekhnika i elektronika, 1959, 2, no. 1, 44), a synchronous double channel reception with a low frequency filter is used. Such a receiver gives better results in the design of matched filters, especially in the presence of white noise as stated by F.M. Vudvard (Ref. 2: Teoriya veroyatnostey i teoriya informatsii s primeneniyami v radiolokatsii. Theory of Probabilities and

Card 1/3

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D201/D303

On the interference killing ...

Information with Radiolocation Utilizations) IZD. Sovetskoye Radio, 1955) and W.W. Peterson, T.G. Birdsall, W.C. Fox (Ref. 3: The theory of signal detectability, I.R.E. Trans., 1954, PG IT-4, 4, 171). The advantages of such a receiver are especially noticeable if the signals are of long duration or represent a group of pulses with a coherent high frequency mark to space ratio as noted by U. Sitert (Ref. 4: Nekotoryye primeneniya teorii obnaruzheniya v radiolokatsii, Radiotekhnika i elektronika 2: Rubezhnim, 1959, 1, 26) and H. Sherman (Ref. 5: Some optimal signals for time measurement, IRE Trans., 1956, PG IT-2, 1, 24). If there is at the input of the HF filter an AM signal and the white noise with the spectral density N_0, then at the output of the filter, there is a signal with the form

$$U_m(t) \sin(\omega_0 t + \varphi)$$

and the Gaussian noise having the correlation coefficient $R(\tau) = \rho(\tau) \cos \omega_0 \tau$ and dispersion

$$\sigma_0^2 = N_0 \Delta :$$

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On the interference killing ...

where Δf_0 is the effective pass-band of the filter. The envelope of the voltage at the output may be given as

$$U = \sqrt{[A(t) + U_{m0}(t)\sin\varphi]^2 + [B(t) + U_{m0}(t)\cos\varphi]^2},$$

as given in V.I. Bunimovich (Ref. 6: Flyuktuatsionnye protsessy v radiopriyemnykh ustroystvakh (Fluctuating Processes in Radio Receiving Devices) IZC Sovetskoye Radio, 1951), where A(t) and B(t) are independent Gaussian functions with the correlation coefficient $r(\tau)$ and dispersion σ_0^2; this presentation of the envelope is used in the quadrature reception. Introducing

$$x = \frac{U}{\sigma_0}; \quad a = \frac{A(t)}{\sigma_0}; \quad b = \frac{B(t)}{\sigma_0}; \quad q = \frac{U_{m0}(t)}{\sqrt{2}\,\sigma_0},$$

the voltage at the output of the quadrature receiver will have the form of

$$x = \sqrt{(a + \sqrt{2}\,q\sin\varphi)^2 + (b + \sqrt{2}\,q\cos\varphi)^2}. \qquad (1)$$

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On the interference killing ...

The technical realization of operation expressed by Eq. (1) is complicated and in the present article two simpler operations are analyzed. The receiving installation becomes very simple if only one channel of the quadrature is to be used. It is proposed in this case to form a signal of the shape

$$x_1 = /a + \sqrt{2}\ q \sin \varphi/ \qquad (2)$$

which describes a single channel sychronous receiver with a modular output. Simplification of the receiver is also achieved if operation (1) is replaced by operation

$$x_2 = |a + \sqrt{2}\, q \sin \varphi| + |b + \sqrt{2}\, q \cos \varphi|. \qquad (3)$$

and the aim of further investigations is to determine the losses due to the interference killing in the reception, which occur when operation (1) is replaced by operations (2) and (3). Reception with random initial phase and signals with fluctuating amplitude is con-

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On the interference killing ...

sidered. 1) The influence of noise in pulse reception with a synchronous receiver having a modular output. If the initial phase φ of the signal is random and uniformly distributed within the interval $(0; 2\pi)$ then the receiver satisfying (1) is optimal. The density of probability distribution of quantity x in this case obeys the Rayleigh-Reiss Law

$$w(x) = x e^{-\left(\frac{x^2}{2} + q^2\right)} I_0(\sqrt{2}\, qx). \qquad (4)$$

in which I_0 - the modified Bessel function of zero order. The magnitudes of x_i as determined by Eq. (2) represent the modulus of the sum of a normal random quantity having a zero mean value and dispersion equal to unity and of values of a sinusoid taken at random. The density of the probability distribution of x_i is therefore given by

$$w_1(r_1) = \frac{1}{\pi\sqrt{2\pi}} \int_{-\pi/2}^{\pi/2} e^{-\left(r_1 - \sqrt{2q}\sin\varphi\right)^2} d\varphi. \qquad (5)$$

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On the interference killing ...

which can be represented as an infinite series

$$w_1(x_1) = \frac{2}{\sqrt{2\pi}} e^{-\frac{(x_1^2+q^2)}{2}} \left[I_0\left(\frac{q^2}{2}\right) I_0(\sqrt{2}qx_1) + \right. \qquad (6)$$

$$\left. + 2\sum_{k=1}^{\infty} (-1)^k I_k\left(\frac{q^2}{2}\right) I_{2k}(\sqrt{2}qx_1) \right],$$

where I_k - the modified Bessel function of the first kind and of the K-th order. Graphs of $w_1(x_1)$ for several values of q are given. From the view point of small signal detectibility, the receiver with one threshold of response is characterized by the ratio of probability of the complex interference F and that of the wanted signal D given by

$$F = \int_{x_0}^{\infty} w_{q=0}(x)\,dx, \quad D = \int_{x_0}^{\infty} w(x)\,dx, \qquad (7)$$

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On the interference killing ...

where x_0 the normalized threshold value and $w_p(x)$ - density of probability distribution of noise in the absence of signal ($q = 0$). Fig. 3 shows the relationship between D and q for F_1 within the limits 10^{-1} - 10^{-10} the broken curves representing the optimal receiver. As could be expected the graphs show that a single channel receiver has worse interference killing properties, especially noticeable for large values of D. This is due to the fluctuating character of the signal even in the absence of noise. This difference decreases with the decrease in D and q. If the signal [illegible] is a superimposition [illegible] signals of nearly the same intensity then the quantity x [illegible]

[illegible] (11)

where $q_0^2 = \sigma_c^2/\sigma_0^2$ is the excess of dispersion of the signal over the

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On the interference killing ...

dispersion of noise of the output of the matched filter. x_1 in this case is the sum of two independent qualities and

$$w_1(x_1) = \frac{2}{\sqrt{2\pi(1 + q_0^2)}} e^{-\frac{x_1^2}{2(1 + q_0^2)}} \quad (12)$$

With an ideal reception, probabilities F and D are

$F = e^{-\frac{x_0^2}{2}}$ (13), and $D = e^{-\frac{x_0^2}{2(1 + q_0^2)}}$ (14). In the case of reception with a synchronous receiver with a modular output the probability F_1 is determined by

$$F_1 = 1 - \Phi\left(\frac{x_0}{\sqrt{2}}\right), \quad (15)$$

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On the interference killing ...

and the probability of true detection D_1 is given by

$$D_1 = 1 - \Phi\left[\frac{r_0}{\sqrt{2(1+q_0)}}\right] \qquad (15)$$

where the probability integral

$$\Phi(z) = \frac{2}{\sqrt{\pi}}\int_0^z e^{-t^2}dt.$$

It seems that in the case of fluctuating signals, the synchronous receiver with modular output shows greater promise; b) The influence of noise on reception of pulses with a quadratic receiver with modular summation. If only the initial phase of the signal is random then from the usual procedure

$$w_2(x_2) = \frac{1}{2\pi\sqrt{\pi}}\int_0^{2\pi}\left[\frac{x_2 - \sqrt{2}z_1(\sin\ + \cos\ )}{}\right]^{\frac{2}{\sqrt{\pi}}\int_{z_1}^{z_2} e^{-t^2}dt}\,d \qquad (16)$$

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On the interference killing ...

follows, where

$$z_1 = \frac{1}{2}\cdot\sqrt{q}\,(\sin\ldots - \cos\ldots) + x_2\sqrt{\ldots}, \quad z_2 = \frac{1}{2}\sqrt{q}\,(\sin\ldots - \cos\ldots) - x_2\sqrt{\ldots}.$$

The integral in the integrand can be represented as

$$\frac{2}{\sqrt{\pi}}\int_{\frac{z_1}{z_2}}^{\ldots} e^{-t^2}dt \quad \begin{cases} \Phi(z_1) - \Phi(z_2), & \frac{z_1}{z_2} < 0, \\ \Phi(\ldots) - \Phi(z_2), & \frac{z_1}{z_2} > 0. \end{cases}$$

and then in the absence ... (17)

follows. Table 1 gives the ... of q_0 securing the required ratio of probabil... $D = D_2$. The effective means

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On the interference [illegible]

[illegible] of detecting small signals [illegible] stage after optimal filtration and [illegible] a reduction in the point of view it has [illegible] parameters characterizing the signal with [illegible] ratio. The [illegible] stability voltage due to the signal and [illegible] of normal approximation [illegible] quantities distributed exponentially and according to the Rayleigh law has been analyzed in detail by Yu. V. Piyak, V S. Kel'zon (Ref. 9; K teorii obnaruzheniya periodicheskikh impul'snykh signalov v Gaussovom shume pri nekogerentnom nakoplenii. Radiotekhnika i elektronika, 1958, 3, 6, 764). In signal [illegible] two receivers assume similar results if the normalized increments △ are equal. Therefore, in storing large numbers [illegible] requires time of operation given by E_i [illegible] approximately, the increase in the [illegible] and the substitution by [illegible] E_i [illegible] times and the substitution by [illegible] stored signals (from by 1 %. With the decrease in the [illegible]

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On the interferen[illegible]

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theory of signal [illegible]
H. Sherman, Some Optimal S[illegible]
1956, PG IT-[illegible]
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Card [illegible]

89135

9,7140 (and 2404, 2903)

S/108/61/016/002/008/011
B107/B212

AUTHOR: Mityashev, B. N., Member of the Society of Radio Engineering and Electric Communication

TITLE: Efficiency estimation of methods to store data when determining the time position of weak pulse signals

PERIODICAL: Radiotekhnika, v. 16, no. 2, 1961, 51-59

TEXT: This paper describes the calculation of the efficiency for a number of typical methods of storing data for a certain time. The calculation has been done by using a sample system where the position of a signal with respect to time is established by comparing the voltage x(t) of signal + noise with a threshold voltage x_0. The following simplifications have been assumed: A pulse with duration T_s passes through a matched filter and a linear amplitude detector and yields a voltage pulse of duration T; this is divided into $m = T/T_s$ sections, the voltage within m is assumed to be independent. The probability of a false alarm F and the correct finding D are calculated by using the following expressions:

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Efficiency estimation of methods ...

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$$F = \int_{x_0}^{\infty} W_n(x)\,dx, \quad (1)$$

$$D = \int_{x_0}^{\infty} W_{sn}(x)\,dx, \quad (2)$$

where $W_n(x)$ and $W_{Sn}(x)$ are the distribution densities of the probability in sections with noise only and with noise and signal. The following probabilities are characteristic for systems which have a threshold value: The probability that noise blips will be larger than the threshold level (it is given by $P_n = 1 - (1 - F)^{m-1}$) and the probability that the signal will be higher than the threshold level. This analysis tries to find the ratio between noise and signal at the output of an optimum HF-filter that will supply the given probabilities P and D for storage. It is assumed that noise at the input of the receiver has an uniform spectral density and that the signal pulse amplitudes are constant. The following expressions are derived for a single pulse:

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$$P_n = 1 - \left(1 - e^{-\frac{x_0^2}{2}}\right)^{m-1}, \quad (6)$$

$$D = \int_{x_0}^{\infty} x e^{-\left(\frac{x^2}{2} + q^2\right)} I_0(\sqrt{2} q x)\, dx. \quad (7);$$

where $x = u/\sigma_0$ is the voltage at the detector output, divided by the effective value of the noise at the input; $q = 1/p$ is the signal to noise ratio at the detector input; I_0 is the modified Bessel function of first kind and zero order. If P_π, D, and m are given then it is possible to calculate the threshold value x_0 from (6) and also the maximum safe noise to signal ratio at the input $p_{lim} = 1/q_{lim}$ from (7). The curves for these values are shown in Figs. 2, 3, and 4. For a coherent pulse train is $p_{lim} = c_1\sqrt{n}$, where c_1 is numerically equal to p_{lim} when a single pulse is received. The following expressions are obtained for an incoherent pulse train:

$$P_n = 1 - [\Phi(x_0)]^{m-1} \quad (12)$$

(12)

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$$D = 1 - \Phi(x_0 - \overline{\Delta x}), \quad (13)$$

$$\Phi(x_0) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{x_0} e^{-\frac{x^2}{2}} dx \quad (13)$$

where $(x_c) = \ldots$ is the Laplace function, $\overline{\Delta x} = \overline{\Delta u}/\sigma$ the increase of the statistic mean of the voltage which is caused by the signal, divided by the effective value of the fluctuation σ. Further is: $p_{lim} = c_2 \sqrt[4]{n}$,

where $c_2 = \ldots$; curves for x_0 and c_2 are represented in Figs. 5, 6, and 7. If the interval between pulses is large summing becomes comparatively complicated. The following multi-channel method is proposed: The interval T that has to be analysed is divided into a number of sections ΔT, then the data are stored in $m_1 = T/\Delta T$ channels. In block diagram Fig. 8a are: 1) and 4) selective filters which open near the interval ΔT; 2) integrator; 3) mean-forming filter for lower frequencies. Square pulses are formed at the output with a duration ΔT and an amplitude proportional to the mean

value of preceding integrals (Fig. 8a). Such a diagram is analogous to a synchronous filter which has been suggested by K. V. Vladimirskiy. The following applies to this circuit: $p_{lim} = c_2(m_1)\sqrt[4]{n/m_2}$, c_2 is determined from diagrams given in Figs. 6 and 7, m is replaced by the number of channels m_1. If a two-side limiter with a level a_0 is added so follows for the coefficient K_π

$$K_n = \int_{a_0}^{\infty} x e^{-\left(\frac{x^2}{2} + s^2\right)} I_0(\sqrt{2}\, q\, x)\, dx - e^{-\frac{a_0^2}{2}}. \qquad (22).$$

(Fig. 10). The coefficient K_π is numerically equal to difference of the probabilities for prevailing signal and noise above the level of the limiter. For $q \ll 1$ is:

$$K_n \approx \frac{a_0^2}{2} e^{-\frac{a_0^2}{2}} q^2. \qquad (23)$$

(dotted in Fig. 10). If one limiter is added: $p_{lim} = 0.91\, c_2(m_1\sqrt[4]{n/m_2}$,

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i.e., adding of one limiter decreases p_{lim} by 10% but here weak noise and noise pulses are better depressed. Summing up: Application of pulse trains with a coherent high-frequency carrier in place of pulses with an undetermined initial phase yields important advantages especially if a large number of pulses are used in a train. Discrete multi-channel storage systems offer the same advantages as systems with immediate summation of the voltage pulses. Adding of limiters is very advantageous. There are 10 figures and 12 Soviet-bloc references.

SUBMITTED: November 16, 1959 (initially)
April 27, 1960 (after revision)

Card 6/8

MITYASHEV, Boris Nikolayevich; IVANUSHKO, N.D., red.; SVESHNIKOV, A.A., tekhn. red.

[Determination of the position of pulses with respect to time in the presence of interference]Opredelenie vremennogo polozheniia impul'sov pri nalichii pomekh. Moskva, Sovetskoe radio, 1962. 198 p. (MIRA 15:12)
(Pulse techniques (Electronics)) (Radar)

MITYASHIN, G.F., uchitel'

Work on the experimental plot of the Uktuz school. Biol. v shkole no. 6:56-57 N-D '60. (MIRA 14:1)

1. Uktuzskaya shkola, Berdyuzhskogo rayona, Tyumenskoy oblasti.
(Uktuz--Agriculture--Study and teaching)
(Corn (Maize))

MITYASHIN, I.A., kandidat meditsinskikh nauk (Molotov)

Production of iodized salt in Molotov Province. Probl. endok. i gorm. 1 no.1:115-117 Ja-F '55. (MLRA 8:10)

1. Iz Kliniki fakul'tetskoy khirurgii (zav.--prof. A.L.Fenelonov) Molotovskogo meditsinskogo instituta i Molotovskogo protivozobnogo dispansera (glavnyy vrach O.S.Kropacheva)

(IODINE,
prod. of iodized salt in Russia)
(SODIUM CHLORIDE,
prod. of iodized salt in Russia)

MITYASHIN, I.A.

Endemic and thyrotoxic goiter in the Western Urals. Probl. endok. i gorm. 6 no. 5:109-113 '60. (MIRA 14:1)
(URAL MOUNTAIN REGION—GOITER) (HYPERTHYROIDISM)

L 17800-63 EWT(d)/FCC(w)/T-2/BDS ASD/ESD-3/APGC/IJP(C)
Pq-4/Pe-4/Pk-4/Pg-4 GG
ACCESSION NR: AP3006400 S/0119/63/000/008/0014/0016 48

AUTHOR: Basove, N. A.; Dobrolyubov, S. A.; Mityashin, I. P.

TITLE: Calculating a pneumatic jet relay

SOURCE: Priborostroyeniye, no. 8, 1963, 14-16

TOPIC TAGS: pneumatic relay, fluid amplification, pneumatic amplifier, nozzle, jet interaction, air jet, pneumatic transducer, sensing element, pneumatic relay calculation, external temperature disturbance

ABSTRACT: A pneumatic relay based on the interaction of air jets has been developed. The relay (see Figs. 1 and 2 of the Enclosure) has no moving parts, is simply constructed, and is not sensitive to external temperature variations. The device consists of a system of nozzles, a throttle valve, and a flapper by means of which the control pressure (P_c) in section A (Fig. 1) can be varied. The following approximate pressure relationship has been derived:

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ACCESSION NR: AP3006400

$$P_{out} = P'_{in} - kP_c, \text{ where}$$

$$k = \frac{L}{Dr} \cdot \frac{P'_{in}}{P_{in}}$$

(P'_{in} is the portion of inlet pressure corresponding to $P_c = 0$; D_r is the receiving-nozzle diameter). Experiments were conducted with nozzles 0.3—1.3 mm in diameter. The experimental results obtained (Fig. 3) for nozzles 0.6 mm and larger in diameter are close to the calculated. For nozzles less than 0.6 mm in diameter, greater differences arose between experimental and calculated results due, in part, to inaccuracies in manufacturing the nozzles and in conducting the experiments. However, experiments conducted with small-diameter receiving nozzles and with control nozzles twice as large in diameter as the supply nozzles produced results in good agreement with the calculated (Fig. 3). The pressure in the chamber behind the receiving nozzle can be calculated from the following

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L 17800-63
ACCESSION NR: AP3006400

expression:

$$P_{ch} = \frac{P_1 R_1^4 + P_2 R_2^4}{R_1^4 + R_2^4}.$$

If nozzle radii $R_1 = R_2$, the pressure in the chamber is $(P_1 + P_2)/2$. The spacing (L) between the power nozzle and receiving nozzle (for nozzle diameters D = 0.3—1.2 mm) was experimentally determined to be 3.5—4.5 times larger than the diameter of the power nozzle (fig. 4). The obtained formulas can be used for design calculation of pneumatic-jet elements with a feed pressure of 1.4 atm. Orig. art. has: 6 figures and 3 formulas.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 23Sep63 ENCL: 04

SUB CODE: AE NO REF SOV: 002 OTHER: 000

Card 3/7

L 06396-67 EWT(d)/EWT(l)/EEC(k)-2/EWP(v)/EWP(k)/EWP(h)/EWP(l)
ACC NR: AP6025287 (A) SOURCE CODE: UR/0119/66/000/007/0021/0023

AUTHOR: Katsnel'son, A. Sh. (Engineer); Mityashin, I. P. (Engineer)

ORG: none

TITLE: Reference instruments operating on a discrete force-compensation principle

SOURCE: Priborostroyeniye, no. 7, 1966, 21-23

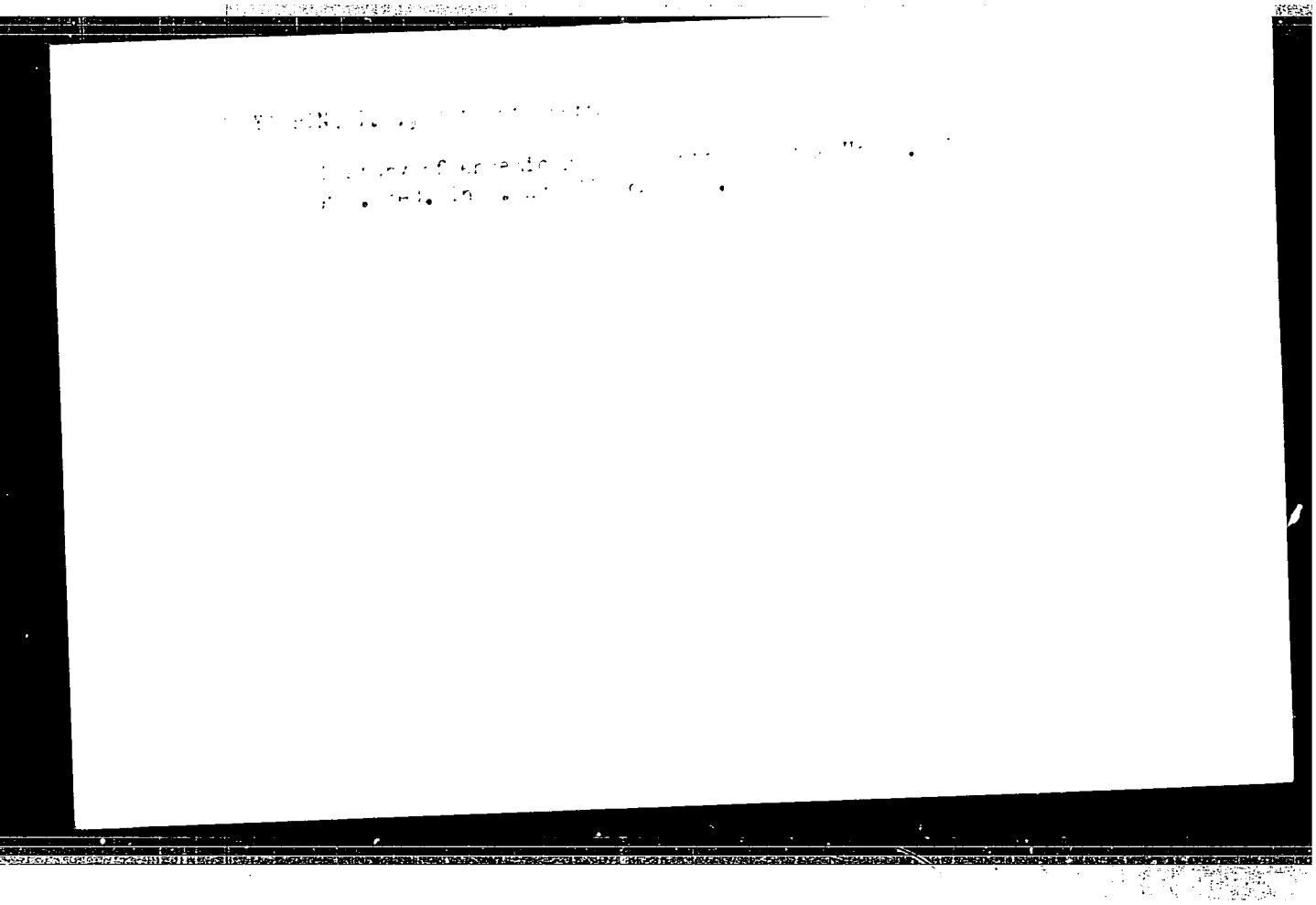
TOPIC TAGS: measuring instrument, digital instrument, reference instrument

ABSTRACT: Developed by the NIITeplopribor Institute, the principle of discrete force compensation consists of the following: the torque produced by a sensor and applied to one arm of a two-arm lever is balanced by several torques applied to the other arm of the lever; the number of latter torques equals to the number of digits in the selected code while individual torques correspond to the code "weight coefficients". Thus, the sensor torque (or force) can be expressed as an output code equivalent. Application of this principle is illustrated by a 13-digit manometer whose block diagram, principal circuit, and time diagram are explained. The manometer range is 0--1 kg/cm^2; error, 0.1%; measurement time, 5 sec. Claimed advantages: high speed, convenient digital reading, possibility of using digital printers. The principle is applicable also to pressure-drop gages, thermometers, flowmeters, level gages, etc. Orig. art. has: 4 figures and 1 formula.

SUB CODE: 14, 13, 09 / SUBM DATE: none / ORIG REF: 001

UDC: 681.2.083

Card 1/1



L 7032-66 ETC(m) WW

ACC NR: AP5026817 SOURCE CODE: UR/0286/65/000/017/0095/0095

34
B

AUTHOR: Mityashin, I. P.; Dobrolyubov, S. A.; Grekov, Ye. A.

ORG: none

TITLE: A direct-action pressure regulator. Class 42, No. 174450 [announced by Smolensk Branch of the Scientific Research Institute of Heat and Power Engineering Equipment (Smolenskiy filial Nauchno-issledovatel'skogo instituta teploenergeticheskogo priborostroyeniya)]

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 17, 1965, 95

TOPIC TAGS: pressure regulator, pressure measuring instrument

ABSTRACT: This Author's Certificate introduces a direct-action pressure regulator which contains a diaphragm-type actuating mechanism with control valve, and also incorporates a measurement diaphragm, spring, and screw for adjustment of the spring tension. The quality of control is improved by using a proportional-plus-integral device which contains a baffle with a groove. This baffle is mounted on the lower side of the measurement diaphragm, and supply and receiving nozzles are located opposite the groove. The supply nozzle is connected with tubing to a high pressure line, and the receiving nozzle is connected to a tank above the diaphragm of the actuating mechanism through a tube containing the control valve for the isodrome.

UDC: 621.646.4

SUB CODE: IE/ SUBM DATE: 15Apr64/ ORIG REF: 000/ OTH REF: 000

Card 1/1

MITYASHIN, M.

Today plenty, tomorrow empty. Grazhd. av. 21 no.10:10 O '64. (MIRA 18:3)

1. Zamestitel' nachal'nika Krasnoyarskogo upravleniya grazhdanskoy aviatsii.

T-12

USSR/Human and Animal Physiology. The Nervous System

Abs Jour : Ref Zhur - Biol., No 14, 1958, No 65617

Author : Ugryumov V.M., Suponitskaya M...., Shtekhter S. Ya., Mityeshin P.D., Maximov V.P.

Inst : -

Title : A New Method for Measuring the Pressure of the Cerebrospinal Fluid

Orig Pub : Vopr. neyrokhirurgii, 1957, No 3, 52-55

Abstract : A compensation principle for measuring the pressure of the cerebrospinal fluid is proposed. An elastic membrane divides a compensator receiver into two chambers. One of them communicates with a needle, and the other with an inflatable balloon, a manometer and an outlet orifice. When the air pressure is turned on, the membrane is deflected from the outlet orifice, and the starting pressure is established in the chamber. The dynamics of the pressure in the air chamber correspond to the fluctuations of the pressure being measured, and are determined by the manometer

Card : 1/2

MITYASHKIN, A., udarnik kommunisticheskogo truda, shofer

"Avtotransportnik" is speaking and showing. Avt. transp. 40 no.10:10 O '62. (MIRA 15:11)

1. Minskiy gorodskoy avtobusnyy park.
(White Russia--Television broadcasting)

MITYASHKIN, D.Z., kand. tekhn. nauk; PCHELKIN, A.I., inzh.

Investigations in the field of electrochemical dimensional shaping of metals. Vest. mashinostr. 45 no. 12:78-81 D '65
(MIRA 19:1)

VANYUSHKINA, Shura; SHKIRKO, MAYYA; MITYASHOVA, Valya

Spreading-habited trees. IUn. nat. no.5:9-10 My '58. (MIRA 11:5)

1.Oblastnaya stantsiya yunnatov, Omsk.
(Apple)

MITYAYEV, A.M.

USSR/Physical Chemistry - Thermodynamics, Thermochemistry, Equilibria, Physical-Chemical Analysis, Phase Transitions. B-8

Abs Jour: Referat. Zhurnal Khimiya, No 3, 1958, 7173.

Author : N.A. Izmaylov, A.M. Mityayev.
Inst : Kharkov University, Faculty of Chemistry; Scientific Research Institute of Chemistry.
Title : Physical-Chemical Analysis in Solutions. I. Determination of Partial Molar Magnitudes of Properties of Different Molecules in Solution. II. Determination of Apparent Partial Molar Magnitudes of Properties of Different Molecules in Solution.

Orig Pub: Uch. zap. Khar'kovsk. un-ta, 1957, 82, Tr. Khim. fak. i N.-i. in-ta khimii, 16, 113-124; 125-138.

Abstract: I. The density and refraction indices of CCl_3COOH (I), C_6H_5OH (II), CH_3CN (III), I + III and II + III solutions in benzene were measured at the temperature of 6.0 ± 0.1°. The apparent mol. volumes V* and refractions R* of the components and compounds

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Card : 1/2

IZMAYLOV, [illegible]; [illegible]

[illegible] ...ions and cal[illegible]

Physicoch[illegible] ...termination of [illegible] yield [illegible] ...operties of [illegible] partial mol[illegible] ...Khim. zhur. [illegible] ...cies in [illegible] ...tion. [illegible] ...1.

1. Khar'kovski[illegible] ...universitet im. ... Gor'kogo. ([illegible] (C[illegible])

[illegible]TYAYEV, [illegible]

[illegible]ng of [illegible] Energetik [illegible] (MIRA [illegible]) [illegible]

MITYAYEV, I.D.

Materials on the biology of the elm ribbed-cocoon-maker (Bucculatrix ulmiella Ger.). Trudy Inst.zool. AN Kazakh.SSR 4:218-222 '55. (MLRA 10:1)

(Alma-Ata--Ribbed-cocoon-maker) (Elm--Diseases and pests)

MITYAYEV, I.D.

Biology of the tamarisk pseudo bark beetle (Xylogenes dilatatus Rtt)
Trudy Inst.zool. AN Kazakh. SSR 4:223-225 '55. (MLRA 10:1)
(Tamarisk--Diseases and pests)
(Ili Valley--Bark beetles)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001134810004-9"

MITYAYEV, I. D.

USSR/General and Systematic Zoology. Insects. Harmful Insects and Acarids. Forest Pests. P

Abs Jour : Ref Zhur - Biol., No 3, 1959, No 11691

Author : Mityayev I.D.
Inst : Zoology Institute AS KazSSR
Title : A Review of the Insects - Pests of the Tamarisks in the Balkhash-Alakul' Hollow.

Orig Pub : Tr. In-ta zool. AN KazSSR, 1958, 8, 74-97

Abstract : On the basis of observations in 1952-1954, biological data of 84 species of tamarisk pests (T) are set forth: 2 species of thrips, 16 of Homoptera, 5 species of bugs, 39 of beetles, 9 species of gall midges, 10 of butterflies and 3 of acarids. A classification key of the T pests according to the exterior appearance of the injuries and the harmful insects and acarids. According

Card : 1/2

MITYAYEV, I.D.

Strawberry and raspberry pests in central and northern Kazakhstan.
Trudy Inst.zool.AN Kazakh.SSR 11:32-35 '60. (MIRA 13:11)
(Kazakhstan--Insects, Injurious and beneficial)
(Berries--Diseases and pests)

MITYAYEV, I.D.

Insect pests of oleaster in Kazakhstan. Trudy Inst.zool.AN Kazakh. SSR 11:108-128 '60. (MIRA 13:11)
(Kazakhstan--Insects, Injurious and beneficial)

MITYAYEV, I.D.

Materials on the biology of gall gnats (Diptera, Itonididae) occurring as tamarisk pests in southeastern Kazakhstan. Ent. oboz. 40 no.1:51-62 '61. (MIRA 14:4)

1. Institut zoologii Akademii nauk KazSSR, Alma-Ata.
(Kazakhstan--Gall gnats)
(Tamarisk--Diseases and pests)

MATESOVA, G.Ya.; MITYAYEV, I.D.; YUKHNEVICH, L.A.; MARIKOVSKIY, P.I., doktor biol. nauk, prof., otv. red.; ALFEROVA, P.F., tekhn. red.

[Insects and mites, pests of fruit and berry crops in Kazakhstan] Nasekomye i kleshchi - vrediteli plodovo-iagodnykh kul'tur Kazakhstana. Alma-Ata, Izd-vo Akad. nauk Kazakhskoi SSR, 1962. 203 p. (MIRA 15:12)

(Kazakhstan--Fruit--Diseases and pests)
(Kazakhstan--Insects, Injurious and beneficial)

MITYAYEV, I.D.

Leafhoppers Typhlocybidae (Auchenorhyncha) as fruit tree pests.
Sbor.ent.rab. no.1:45-54 '62. (MIRA 16:2)
(Soviet Central Asia--Fruit trees--Diseases and pests)
(Soviet Central Asia--Leafhoppers)

MATESOVA, G.Ya.; MITYAYEV, I.D.; YUKHNEVICH, L.A.

Review of insects damaging fruit and berry crops and grapevines in southwestern Kazakhstan. Trudy Inst. zool. AN Kazakh. SSR 18: 3-45 '62. (MIRA 17:3)

MATESOVA, G.Ya.; MITYAYEV, I.D.

Insects damaging fruit and berry crops in Urdzhar and Makanchi Districts, Semipalatinsk Province. Trudy Inst. zool. AN Kazakh. SSR 18:46-56 '62. (MIRA 17:3)

MITYAYEV, I.D.

Russian olive (Elaeagnus angustifolia L.) pests in the cultivated zone of the southern provinces of Kazakhstan. Trudy Inst. zool. AN Kazakh. SSR 18:61-68 '62.

Auchenorhyncha (Homoptera) of farm crops in northeastern Kazakhstan. 142-149
(MIRA 17:3)

YUKHNEVICH, Lidiya Aleksandrovna; MATESOVA, Galina Yakovlevna; MITYAYEV, Ivan Dmitriyevich; SHEVCHUK, T.I., red.; RORCKINA, Z.P., tekhn. red.

[Orchard and garden pests and measures for their control in southeastern Kazakhstan] Vrediteli sadov i ogorodov i mery bor'by s nimi; Iugo-Vostochnyi Kazakhstan. Alma-Ata, Izd-vo AN Kaz.SSR, 1963. 64 p. (MIRA 16:5)
(Kazakhstan--Insects, Injurious and beneficial--Control)

MITYAYEV, I.D.

New and little-known species of leafhoppers (Auchenorrhyncha, Typhlocybinae) from Kazakhstan. Ent. oboz. 42 no.2:399-409 '63. (MIRA 16:8)

1. Institut zoologii AN KazSSR, Alma-Ata.
(Kazakhstan--Leafhoppers)

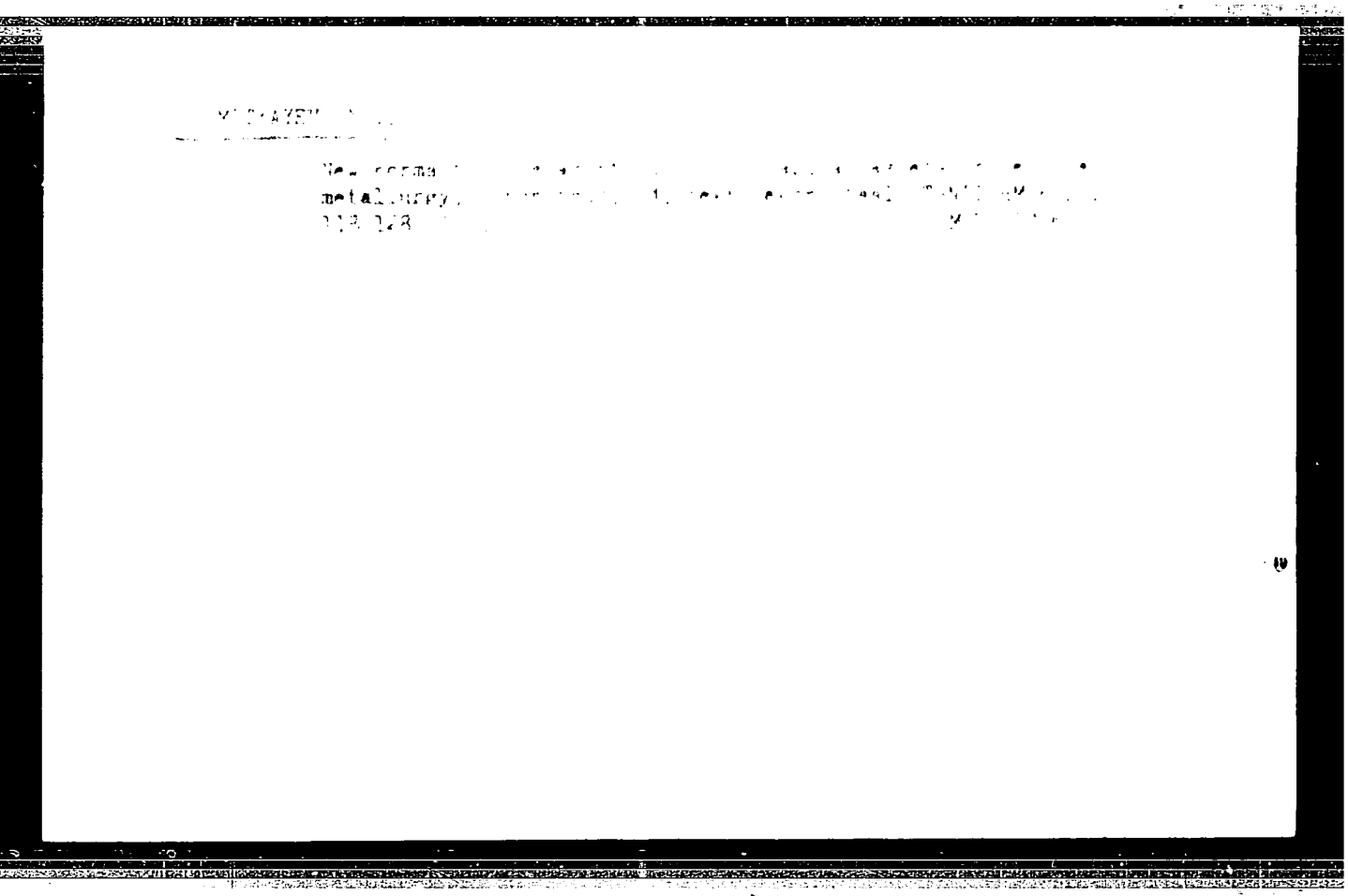
KUZIN, A.A.; MITYAYEV, K.G., redaktor; LYUBIMOVA, V.V., tekhnicheskiy redaktor

[Technical archives; a manual] Tekhnicheskie arkhivy; uchebnoe posobie. Pod red. K.G.Mitiaeva. Moskva, Moskovskii gosudarstvennyi istoriko-arkhivnyi institut, 1956. 252 p. (MLRA 9:12)
(Archives)

MITYAYEV, N.I., elektromekhanik .

Police telephones for communication with power distribution dispatchers. Avtom., telem. i sviaz' 7 no.10:39 O '63. (MIRA 16:11)

1. Ryazanskaya distantsiya signalizatsii i svyazi Moskovskoy dorogi.



MITYAYEV, N.I.; POPOV, [illegible]

Use of industrial capital assets in the iron and steel industry. Stal' 25 no.2:163-168 F '65. (MIRA 18:3)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii imeni I.P. Bardina i Gosudarstvennyy komitet po chernoy i tsvetnoy metallurgii

[redacted]

DOLLEZSAL, N.A. [Dollezhal, N.A.]; KRASZIN, A.K. [Krasin, A.K.]; GALANYIN, N.A. [Galanin, N.A.]; ALESCSENKOV, P.I. [Aleshchenkov, P.I.]; GRIGORJANC, A.N. [Grigoryants, A.N.]; JEMELJANOV, I.Ja. [Yemelyanov, I.Ya.]; KUGUSEV, N.M. [Kugushev, N.M.]; MINASIN, M.E.; MITYAJEV, U.I. [Mityayev, U.I.]; FLORINSZKIJ, B.V. [Florinskiy, B.V.]; SARAPOV, B.N. [Sarapov, B.N.]; ILLY, Jozsef [translator]

Superheated high-pressure steam producing uranium - graphite reactor. Atom taj 2 no.1:1-47 Ja '59.

GHENDON, Yu. Z.; MITYAYEV, V. A.

Investigations into the accumulation of vaccinia virus in cells and culture fluid from tissue cultures. Acta virol.Engl.Ed.Praha 5 no.5: 305-307 S '61.

1. The Moscow Scientific-Research Institute of Virus Preparations, Moscow.

(VACCINIA virol)

MITYAYEV, V.A.

Chamber for cytological study of tissue cultures in a dynamic state. Vop.Virus. 8 no.1:102-104 Ja-F'63. (MIRA 16:6)

1. Moskovskiy nauchno-issledovatel'skiy institut virusnykh preparatov.
(TISSUE CULTURE)

L 34867-66 EWT(1) IJP(c)
ACC NR: AP6014520 SOURCE CODE: UR/0115/65/000/011/0033/0036

AUTHOR: Mityayev, V. V.; Sil'vanskiy, I. V.

ORG: none

TITLE: Automatic recorder of static hysteresis loops of hard magnetic materials

SOURCE: Izmeritel'naya tekhnika, no. 11, 1965, 33-36

TOPIC TAGS: hysteresis loop, ferromagnetic material, potentiometer, electric measuring instrument

ABSTRACT: The ballistic method of measuring hysteresis loops takes much time for measurement proper and for subsequent data processing; it also requires special accommodations for the ballistic galvanometer. The Hall-generator method is more suitable for product control than for laboratory use that involves specimens of various shapes and sizes. Hence, the authors suggest a return to the classic induction transducers (a horseshoe-shaped potential meter and

Card 1/2 UDC: 621.317.43.087.4

L 34867-66
ACC NR: AP6014520

measuring coil wound around the mid-specimen) and slow-varying-flux method; the latter, although more complicated, has none of the shortcomings of the ballistic or Hall-generator methods. The authors' outfit includes a current shaper (a dynamoelectric amplifier), an electromagnet, and a measuring unit proper that integrates and amplifies transducer signals. A two-coordinate 400 x 500-mm recorder plots hysteresis loops. Investigation of the above laboratory outfit showed the following: (1) The outfit has the same error as the ballistic equipment; theoretically, this overall error amounts to 1.5%; (2) The outfit, in its present semiautomatic form, takes 5 min to produce a hysteresis loop; (3) The outfit permits recording quasistatic loops; the measuring-unit drift and the integration constant permit studying particular magnetization cycles; (4) The sensitivity and accuracy of the measuring unit permit studying the effect of temperature on characteristics of ferromagnetic materials; (5) The magnetizing-current shape cuts down the installed capacity of the power source. Orig. art. has: 4 figures and 5 formulas.

SUB CODE: 20,14/ SUBM DATE: none / ORIG REF: 003

Card 2/2 vmb

MITYAYEV, Yu.

Peaceful uses of atomic energy as exhibited at the Leipzig Fair.
Atom. energ. 19 no.1:95-96 Jl '65. (MIRA 18:7)

YEFIMOV, B.V.; MITYAYEV, Yu.I.

Activation cross section of U^{236}. Atom. energ. no.5:130-131 '56. (MLRA 10:2)

(Uranium--Isotopes)

MITYAYEV, Y. I.

9184
THE ACTIVATION CROSS-SECTION OF U^{235}. B. V. Efimov and Y. I. Mityaev. J. Nuclear Energy 5, No. 1, 158-9(1957).
The value of 24.6 ± 6b was found for the radiative capture cross section of U^{236} (M. C.)

MITYAYEV, Y. I.

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001134810004-9

CARD 1 / 2

SUBJECT USSR / PHYSICS
AUTHOR EFIMOV,B.V., MITJAEV,JU.I.
TITLE The Activation Cross Section of U^{236}
PERIODICAL Atomnaja Energija, 1, fasc. 5, 130-131 (1956)
Issued: 1 / 1957

The values of the cross sections of radiation capture and fission are of particular importance for thermal neutrons. Here the cross section of radiation capture was measured from the β-activity of the U^{237} produced on the occasion of the capture of neutrons by U^{236}. The U^{236} samples were irradiated in the reflector of the reactor of the RFT (?). The strength of the neutron bundle was determined from the activity of a gold foil which was irradiated together with the sample. The authors made use of two U^{236} samples: Sample No 1 was produced by the chemical separation of uranium from deposited plutonium containing Pu^{240}. Sample No 2 was obtained by long irradiation of uranium in a reactor, U^{236} on this occasion accumulated by the radiation capture of neutrons in U^{235}. After irradiation the relative content of U^{236} was increased by isotope separation. On the occasion of the irradiation of the samples containing U^{236} in the reactor, apart from fission and the reaction $U^{236}(n,\gamma)U^{237}$, which are of interest here, the following reactions were able to exercise influence on the

SOV/89-4-5-2/25

AUTHOR: Dollezhal', N. A., Krasin, A. K., Aleshchenkov, P. I., Grigor'yants, A. N., Florinskiy, B. V., Minashin, M. Ye., Yemel'yanov, I. Ya., Kugushev, E. M., Sharapov, V. N., Mityayev, Yu. I., Galanin, A. N.

TITLE: A Uranium-Graphite Reactor With Superheating of Steam of High Pressure. I (Uran-grafitovyy reaktor s peregrevom para vysokogo davleniya)

PERIODICAL: Atomnaya energiya, 1958, Vol. 4, Nr 5, pp. 225-241 (USSR)

ABSTRACT: The 400 MW plant is equipped with 4 uranium-graphite reactors. A reactor and a steam turbine of 100 MW together form a closed block. A number of investigations was carried out for the purpose of checking the individual parts of this block. The following results were obtained:
1) With a thermal flux of ~$1 \cdot 10^{13}$ neut./cm^{2}h the steam content by weight at the outlet attains a value of up to 20%.
2) Several hundred hours' uninterrupted operation of a channel in case boiling stage did not disrupt the channel.
3) The activity of the steam condenser was found to be 10 times

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lower than that of the water in the separator.
4) If the content of steam in the steam-water mixture attains 15 - 20%, a pulsation of the consumption of the mixture occurs. From the moment at which the steam mixture passes from the separator into the turbine, pulsation stops and does not occur again in the course of a further increase of the steam phase.
5) During the initial development of the waterlevel in the separator the temperature in the fuel channels fluctuates considerably. As soon as stable conditions are established, these fluctuations cease.
6) The steam-water mixture was not found to be delayed in any of the channels.
From a plurality of varieties the best scheme for the production of superheated steam was selected (see figures). The turbogenerator BK-100 operates with a steam of 90 ata and a temperature of 480 - 535° C.

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The following are the physical characteristics of the reactor:

Thermal output	285 MW
Electrical output	100 MW
Average cycle	750 days
Uranium charge	90 tons
Uranium enrichment at the beginning of a cycle	1,5 %
Uranium enrichment at the end of a cycle	1,03 %
Breeding ratio at the beginning of a cycle	65 %
Breeding ratio at the end of a cycle	55 %
Amount of U-235 burned-up during a cycle	243 kg
Amount of Pu-239 burned-up during a cycle	55 kg
Amount of Pu-239 and Pu-241 at the end of a cycle	132 kg
Excess reactivity for temperature effect	0,040
Excess reactivity for poisoning	0,015
Excess reactivity for the fuel burn-up and long-lived fission fragments	0,025
Total excess reactivity	0,080

There are 8 figures.

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SOV/89-4-5-2/25

AUTHOR: Dollezhal', N. A., Krasin, A. K., Aleshchenkov, P. I., Grigor'yants, A. N., Florinskiy, B. V., Minashin, M. Ye., Yemel'yanov, I. Ya., Kugushev, E. M., Sharapov, V. N., Mityayev, Yu. I., Galanin, A. N.

TITLE: A Uranium-Graphite Reactor With Superheating of Steam of High Pressure. II (Uran-grafitovyy reaktor s peregrevom para vysokogo davleniya) (Continued from abstract 2/25)

PERIODICAL: Atomnaya energiya, 1958, Vol. 4, Nr 5, pp. 225-241 (USSR)

ABSTRACT: The graphite mantle of the reactor (diameter [illegible] m, height [illegible] m) is built into a cylindrical steel container. The [illegible] is filled with nitrogen in order to prevent [illegible] graphite. The active zone of the reactor has a diameter [illegible] and a height of 6 m. It is a lateral reflector [illegible] zone is used. Graphite of [illegible] m thickness is used as [illegible] reflector, and above it a layer of cast iron having a [illegible] m is fitted. Together these components serve as the main [illegible] of the / shield. Graphite of [illegible] m thickness is [illegible] lower reflector. In the graphite structure openings [illegible] channels are provided. 730 of them are provided with fuel ele-

Card 1/3

ments which are cooled by means of boiling water and contain up to 35% percentage by weight of steam at the output. The channels are cooled by steam which is heated up to the corresponding turbine temperature. Six channels contain the automatic regulating rods, 49 channels are provided for the compensation rods, and 10 for the ship rods. The ionization chambers and counting tubes are located in 36 channels. The fuel channels, the regulating and ship rods as well as the arrangement of the channels in the active zone are shown in form 2 drawings. The circuit diagram for the reactor turbine shows the connection between the reactor, the two-stage turbine, two condensers, a system of additional heating of the feed-water, a de-aerator (6 ata), 2 pre-waters (for high pressure), condensation- and feed pumps. The water is conveyed into the boiling channels by way of two centrifugal pumps. When entering these channels the water has a temperature of 300° C and a pressure of 155 ata. The mixture of steam and water formed in these channels reaches the separator, where steam and water are separated. From here the water is conveyed to the preheater of the steam generator (which consists of 2 parts), where it is cooled from the saturation temperature of 340° C (pressure in the sep-

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[illegible] water [illegible] ata) to 240° C. Heat is transferred [illegible] the [illegible] water of the secondary circuit. The water of the [illegible] circuit is in the first section of the preheater brought [illegible] to [illegible] 315° C (saturation temperature, which corresponds to a pressure of 110 ata. In the second part it is evaporated [illegible] the quantity of steam corresponding to feed-water attained. The secondary steam produced in the steam [illegible] is led [illegible] to the steam channels of the reactor, where it is [illegible] with a temperature of 410° C. The steam reaches [illegible] with a pressure of 90 ata and a temperature of 500° C. The main building of the electric power plant consists of 4 parts arranged one behind the other, the machine hall, the steam [illegible] the de-aerator, and the reactor hall. For an average cycle of 750 days it is shown by calculation that the [illegible] are equal to the 4th obtained by means of the [illegible] Fuel costs amount to from 30 to 40% of the [illegible] fuel channels and fuel elements operate [illegible] It is proved that by a slight increase [illegible] enrichment in uranium the average cycle can be [illegible] leads to a reduction of costs. There are [illegible]

Card 3/3

MITYAYEV, Yu.

Development of nuclear power engineering in the German Federal Rupublic. Atom.energ. 8 no.6:570-572 Je '60. (MIRA 13:6)

(Germany, West—Nuclear engineering)

MITYAYEV, Yu.

Hungarian Industrial Exhibition in Moscow. Atom. energ. 9 no.6:515-516 D '60. (MIRA 13:12)

(Moscow—Exhibitions)
(Hungary—Nuclear counters)

MITYAYEV, Yu.

Designs of ractors for atomic power plants. Atom. energ. 10 no.1:86-91 Ja '61. (MIRA 13:12)
(Nuclear reactors)

MITYAYEV, Yu.

Conference of the Atomic Forum of the German Federal Republic. Atom. energ. 10 no.3:291 Mr '61. (MIRA 14:3)
(Germany, West—Atomic energy)

MITYAYEV, Yu.

Atomic energy in Japan. Atom. energ. 12 no.6:544-547 Je '62. (MIRA 15:6)

(Japan—Atomic energy)

S/089/62/013/003/006/007
B102/B104

AUTHOR: Mityayev, Yu.

TITLE: Atomic energy in the German Democratic Republic

PERIODICAL: Atomnaya energiya, v. 13, no. 3, 1962, 287-291

TEXT: A very full account is given of the various institutions in Eastern Germany concerned either directly or indirectly with atomic energy. An agreement for cooperation in regard to the uses of atomic energy has existed between the German Democratic Republic and the USSR since 1955. The Scientific Council for the Peaceful Uses of Atomic Energy with various Commissions affiliated to it, the Committee for Nuclear Research and Engineering and the Central Institute for Nuclear Physics in Rossendorf near Dresden were all established in the same year along with a Department of Nuclear Engineering at the Technische Hochschule (Technical University) in Dresden. The Scientific Council is responsible for planning research and other projects up to 1980. The Committee for Nuclear Research and Engineering is directly controlled by the Council of Ministers. Besides coordinating the work and planning the research projects this body is

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S/089/62/013/003/006/007
B102/B104

responsible in particular for extending the applications of atomic energy in the public economy, for monitoring radioactive contamination in Eastern Germany, for the use of radioactive materials including standardization of the permissible radiation doses, and finally for information and publications. The Central Institute for Nuclear Physics has 6 Departments and employs some 1000 specialists. The Reactor Engineering and Neutron Physics Department has a BER-2 (VVR-S) swimming pool reactor built in 1957 with help from the USSR, where several research groups are working. The Radiochemistry Department also consists of several groups and laboratories. It is responsible for the reprocessing of nuclear fuel and for the manufacture of radioisotopes and activated compounds: the scope of which is continually increasing (1960: 28,900 millicuries; 120 radioisotopes and 250 compounds). The Department has a cyclotron ($E_{\alpha max}$ = 27 Mev, $E_{d\ max}$ = 13.5 Mev) of Russian origin. The other departments are those for Nuclear Physics, Engineering and Electronics, Theoretical Physics, and that for Materials and Solids which investigate radiation effects. The following Institutes also are concerned with atomic energy: the Institute of Nuclear Physics in Miersdorf near Berlin which has several

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Atomic energy in the German ...

accelerators; the Institute of Applied Radioactivity and the Institute of Physical Methods of Separation in Leipzig; the Institute of Medicine and Biology in Buch near Berlin with about 1,000 collaborators; an office for radioisotope supplies in Berlin; the Institute for Applied Physics of High-purity Substances in Dresden, which has several cobalt sources of 1,000-3,000 curie strength and a Van de Graaff generator; an Institute described in "Kernenergie", 4, no. 10/11, 121, 1961; the Institute for Slimes and Aerosols in Friedrichshagen near Berlin; the Institute of Magnetohydrodynamics at the Eastern German Academy of Sciences in Jena (Theoretical and Experimental Plasma Physics); and the Scientific and Technological Office for Reactor Construction in Pankow near Berlin. The construction of the first atomic power station in Berlin was begun in 1957 and is now nearing completion; the following are technical data for its reactor: thermal power 265 Mw; electric power - 70 Mw; water pressure in the first loop - 100 atm; water temperature - 250° at inlet, 267°C at outlet; saturated steam pressure - 32 atm; steam saturation temperature - 231°C; fuel - enriched (1.4-1.5%) UO_2 in zirconium cans. A mobile exhibition and the journal "Isotopentechnik" are used to publicize the uses for isotopes. Firms such as "Vakutronik", "Laborbau" and "Labortechnik" supply

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Atomic energy in the German ...

apparatus and measuring instruments. Eastern Germany cooperates with all the Eastern group of countries and sends representatives to the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research) in Dubna. There are 2 figures.

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MITYAYEV, Yu.

Work on nuclear engineering in Sweden. Atom. energ. 13 no.4:395-396 O '62. (MIRA 15:9)
(Sweden—Nuclear engineering)

MITYAYEV, Yu.

Nuclear research center at ISPRA. Atom. energ. 14 no.2: 226-228 F '63. (MIRA 16:1)

(Nuclear research—International cooperation)

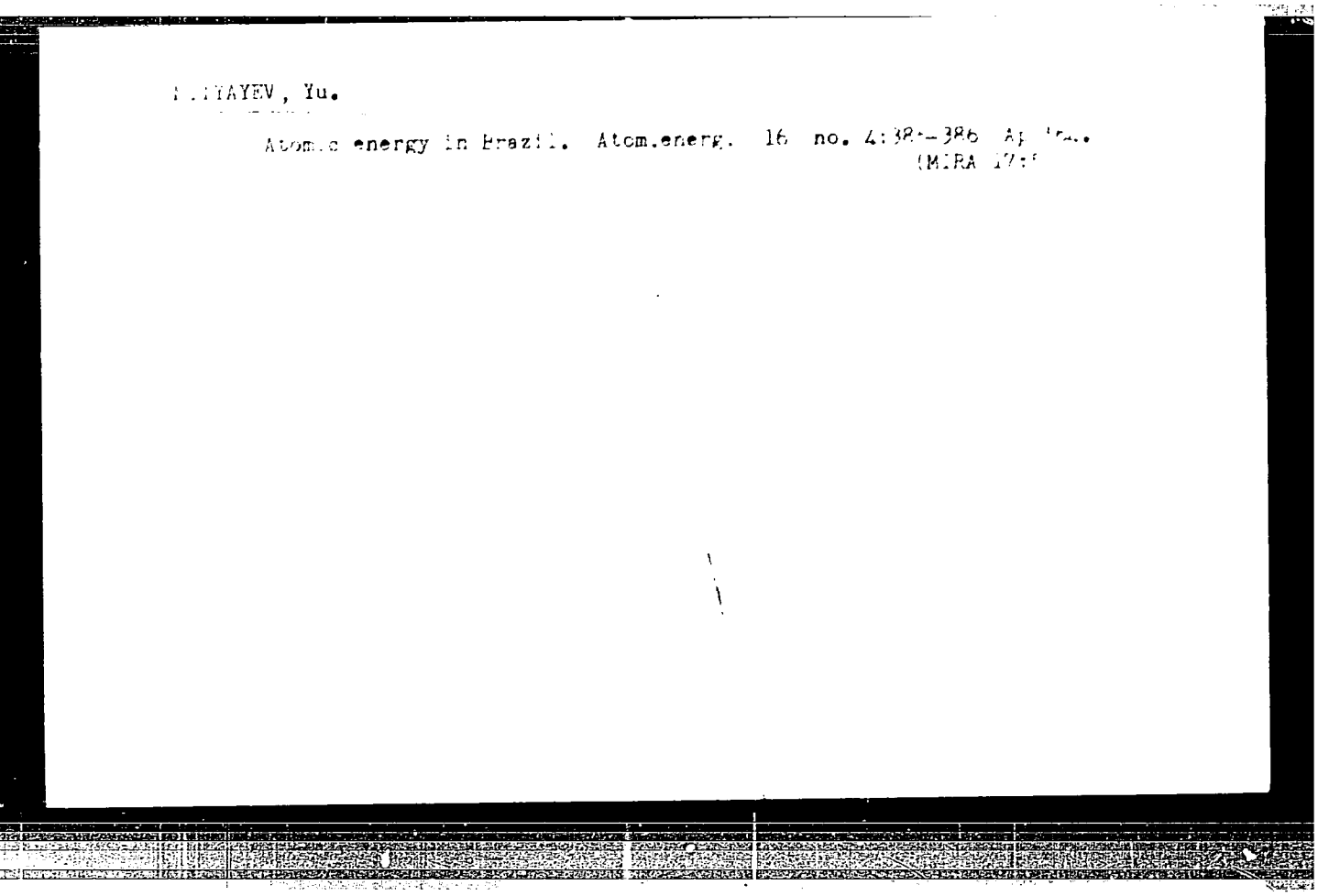
DOLLEZHAL, N. A.; ALESHCHENKOV, P. I.; YEMELYANOV, I. Ya.; ZHIRNOV, A. D.; ZVEREVA, G. A.; MORGUNOV, N. G.; KRYUKOV, K. A.; MITYAYEV, Yu. I.; KNYAZEVA, G. D.

"Development of superheating power reactors of Beloyarsk nuclear power station (BAES) type."

report submitted for 3rd Intl Cong, Peaceful Uses of Atomic Energy, Geneva, 31 Aug-9 Sep 64.

MITYAYEV, Yu.

Conference at Montreal. Atom energ. 16 no.3:272-273 Mr '64.
(MIRA 17:3)



I.TYAYEV, Yu.

Atomic energy in Brazil. Atom.energ. 16 no. 4:382-386 Ap '64.
(MIRA 17:5

8c

L 20048-65 EPF(c)/EPF(n)-2/EPR/EWT(m) Pr-4/Ps-4/Pu-4 SSD/AFWL DM
ACCESSION NR: AP4049533 S/0089/64/017/005/0335/0344

AUTHORS: Dollezhal', N. A.; Yemel'yanov, I. Ya.; Aleshchenkov, P. I.; Zhirnov, A. D.; Zvereva, G. A.; Morgunov, N. G.; Mityayev, Yu. I.; Knyazeva, G. D.; Kryukov, K. A.; Smolin, V. N.; Lunina, L. I.; Kononov, V. I.; Petrov, V. A.

TITLE: Development of Power reactors of the type used in the Belo-yarsk Atomic Station with nuclear steam superheat

SOURCE: Atomnaya energiya, v. 17, no. 5, 1964, 335-344

TOPIC TAGS: reactor feasibility study, reactor fuel element, reactor power, reactor coolant

ABSTRACT: After stating that a desirable trend in the development of reactor construction is towards larger per unit power ratings, which call for larger turbine steam pressures and temperatures, the authors discuss the feasibility of further development of uranium-

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ACCESSION NR: AP4049533

graphite reactors of the channel type, such as are used in the Beloyarsk atomic electric station, with nuclear superheating of the steam. The rating has been increased to 200 MW by changing over from two-loop to single-loop operation and by modifying the working channels. The use of trans-critical parameters will improve the heat transfer and hydrodynamics of the coolant flow and, together with the use of single-pass construction will make ratings of 800--1000 MW possible. Burnup rates of 40--45 thousand MW-day are projected with 5% enrichment. Other topics discussed are possible interchangeability of fuel elements, optimal fuel element construction, optimal channel arrangement, and possible improvements in the neutron balance and distribution. Orig. art. has: 8 figures and 3 tables.

ASSOCIATION: None

Card 2/3

ACCESSION NR: AP4041446 S/0089/64/016/006/0489/0496

AUTHORS: Aleshchenkov, P. I.; Mityaev, Yu. I.; Knyazeva, G. D.; Lunina, L. I.; Zhirnov, A. D.; Shuvalov, V. M.

TITLE: The Beloyarsk atomic electric station

SOURCE: Atomnaya energiya, v. 16, no. 6, 1964, 489-496

TOPIC TAGS: nuclear power, nuclear power reactor, nuclear power-plant, reactor control, reactor core, reactor coolant, reactor operation

ABSTRACT: The first and second reactors of the Beloyarsk atomic power station, with an electric output of 1000 megawatts, are described. These are uranium-graphite reactors of the pressurized water type, with the tubes used for both steam generation and superheating. Several advantages claimed for this construction, which is similar to that used in the first atomic station of the

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ACCESSION NR: AP4041446

SSSR, are listed. The graphite stacks are the same in both reactors, which differ in the number of control rods, the excess reactivity, and the sizes of the steam tubes. One reactor is cooled by one double-circulation loop and feeds a 100 MW turbine which uses 480--510C and 90--100 atm steam. The second reactor operates with a single-circulation two-loop system, each feeding a 100 MW turbine at 500C and 90 atm. The most important experiments preceding the construction of the station are described: cooling the working channels with boiling water, nuclear steam superheating, determination of the transport of activity by the steam, tests of the fuel elements, and others. Ways of improving the economic performance of the station are indicated. The thermodynamic diagram and the main characteristics of a reactor of analogous construction for 1000 MW power, using supercritical water as a coolant, are described in conclusion. Orig. art. has: 5 figures and 1 table.

ASSOCIATION: None

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APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001134810004-9

ACCESSION NR: AP4041446

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SUBMITTED: 27Apr64

OTHER: 001

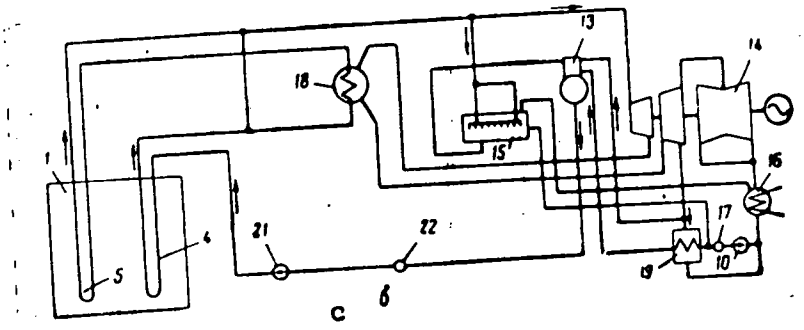
SUB CODE: NP, LE

NR REF SOV: 005

Card 3/5

ENCLOSURE: 02

ACCESSION NR: AP4041446



Principal heat flow diagrams: a, b - 1st and 2nd Beloyarsk reactors, c - reactor with supercritical carrier parameters.

1 - reactor, 2 - evaporation channel, 3 - steam heating channel, 4 - 1st superheat channel, 5 - 2nd superheat channel, 6 - circulating pump, 7- steam superheater, 8 - preheater, 9 - evaporator, 10 - condensate pump, 11 - feedwater pump, 12 - superheat regulator, 13 - deaerator, 14 - turbine generator, 15 - surge tank, 16 - condenser, 17 - condensate purifier, 18 - commercial superheater, 19 - regenerative low-pressure preheater, 20- regenerative high-pressure preheater, 21 - feedwater turbine pump, 22 - booster pump

Card 5/5

DOLLEZHAL', N.A.; YEMEL'YANOV, I.Ya.; ALESHCHENKOV, P.I.; ZHIRNOV, A.L.; ZVEREVA, G.A.; MORGUNOV, N.G.; MITYAYEV, Yu.I.; KNYAZEVA, G.D; KRYUKOV, K.A.; SMOLIN, V.N.; LUNINA, L.I.; KOHONOV, V.I.; PETROV, V.A.

Development of power reactors typifying those of the Beloyarsk Atomic Power Station using nuclear-superheated steam. Atom. energ. 17 no.5:335-344 N '64. (MIRA 17:12)

YEFIMOV, Vasiliy Vasil'yevich; MITYAYEVA, Yu.P., red.

[Physical work at an elderly age] Fizicheskii trud v pozhilom vozraste. Moskva, Izd-vo Mosk. univ., 1965. 42 p. (MIRA 18:7)

LEVIN, Fedor Ivanovich; MITYAYEVA, Yu.P., red.

[Role of mechanical cultivation for the improvement of turf-Podzolic soils] Rol' mekhanicheskoi obrabotki v uluchshenii svoistv dernovo-podzolistykh pochv. Moskva, Izd-vo Mosk. univ., 1965. 126 p. (MIRA 18:8)

AFANAS'YEVA, Tat'yana Vasil'yevna. kand. biol. nauk; LAVRISHCHEVSKIY, Yu.A., doktor geogr. nauk, prof., nauchn. red.; MITYAYEVA, Yu.P., red.

[Use of aerial methods in mapping and studying of soils] Ispol'zovanie aerometodov pri kartirovanii i issledovanii pochv. Moskva, Izd-vo Mosk. univ., 1965. 156 p. (MIRA 18:10)

1. Kafedra geografii pochv biologo-pochvennogo fakul'teta Moskovskogo gosudarstvennogo universiteta (for Afanas'yeva).

SHTIFMAN, L.M.; MIZYAYEVA, A.A.; SHELMYATSIKOVA, V.T.

Conductometric determination of fluorine, iodine, and chlorine.
Zav. lab. 31 no.1:39-40 '65. MIRA 18:3)

S/020/62/143/003/024/029
B101/B144

AUTHORS: Topchiyev, A. V., Academician, Kaptsov, N. N., Kalyuzhnaya, G. D., Mityayeva, A. I., and Balitskaya, I. Ye.

TITLE: Interaction of polymers and copolymers of 2-methyl-5-vinyl pyridine with aromatic nitro compounds

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 143, no. 3, 1962, 621 - 624

TEXT: To test the activity of the pyridine-nitrogen atom in addition reactions, polymers (PI) of 2-methyl-5-vinyl pyridine (I) and its styrene copolymers (SI) were reacted with various polar compounds. A PI with softening point 186°C and three SI with I : styrene ratio of 5 : 1, 3 : 1, and 1 : 1 were used. To test the effect of basicity on the reaction with dinitro compounds, the SI with ratio 1 : 1 was nitrated by means of 73% HNO_3 and 24% H_2SO_4 at 20°C (decomposition of this nitro compound occurred above 200°C). 2.5%, 5%, and 10% solutions were prepared from PI and SI in a mixture 1 : 1 of dinitro toluene (DNT) and dinitro xylene (DNX); their viscosity was measured and was found to increase with length of heating. The same behavior was found in the case of nitrated SI. An

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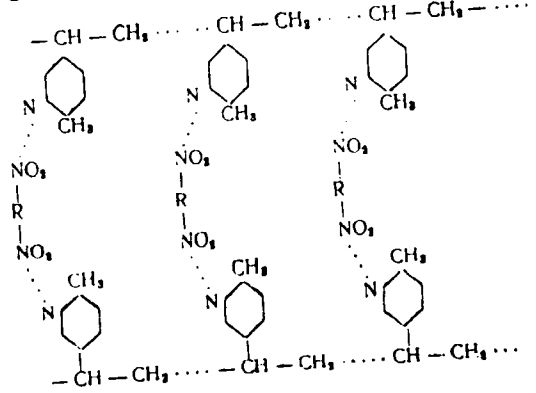
B101/B144

Interaction of polymers...

extraction of PI dissolved in DNT + DNX by means of benzene was unsuccessful. The increasingly dark red and finally dark brown polymer became insoluble in benzene, and its melting point was higher than 250°C. From this, cross linking was concluded, and the structure



was propcsed. As unpurified DNT + DNX mixture caused a considerable

Card 2/4

GALIKEYEV, KH. L.; MITYAYEVA, I.L.

Bactericidal effect of certain tree leaves growing in southern Russia. (MIRA 12:1)
Gig. i san. 23 no.12:76-77 D '58.
(LEAVES) (BACTERICIDES)

MITYAYEVA, M. P.: Master Biol Sci (1:88) -- "The arteries of the tissues of the metatarsal joint of agricultural animals". Moscow, 1958. 17 pp (Moscow Vet Acad Min Agric USSR), 140 copies (KL, No 1, 1959, 117)

GROMOV, Leonid Innokent'yevich; MITYAYEVA, Nina Antonovna; PROZOROVSKIY, V.I., red.; ROGOV, A.A., red.; BOGACHEVA, Z.I., tekhn.red.

[Manual of histology in medical jurisprudence] Posobie po sudebnomeditsinskoi gistologii. Pod red. V.I. Prozorovskogo. Moskva, Gos. izd-vo med.lit-ry, 1958. 204 p. (MIRA 12:2)
(HISTOLOGY--JURISPRUDENCE)

MITYAYEVA, N.A.

Fatal bleeding from a diaphragmatic vessel following puncture. (MIRA 15:4)
Sud.-med. ekspert. 5 no.1:51-53 Ja-Mr '62.

1. Nauchno-issledovatel'ski. institut sudebnoy meditsiny (dir. - prof. V.N.Prozorovskiy) Ministerstva zdravookhraneniya SSSR.
(HEMORRHAGE)

MITYAYEVA, N.A.

Pneumonias and pathological states as the cause of sudden death among the newborn and nrusing infants. Sud.-med.ekspert. 5 no.3:19-24 Jl-S '62. (MIRA 15:9)

1. Nauchno-issledovatel'skiy institut sudebnoy meditsiny (dir. - prof. V.I.Prozorovskiy) Ministerstva zdravookhraneniya SSSR.
(INFANTS--MORTALITY) (PNEUMONIA)

PROZOROVSKIY, V.I., zasl. deyatel' nauki, prof., otv. red.; BRONNIKOVA, M.A., prof., red.; GROMOV, L.I., prof., red.; KANTER, E.I., st. nauchn. sotr., red.; KOLOSOVA, V.M., st. nauchn. sotr., red.; KUBITSKIY, Yu.M., prof., red.; MITYAYEVA, N.A., st. nauchn. sotr., red.; RUBTSOV, A.F., st. nauchn.sotr., red.; SMOL'YANINOV, V.M., prof., red.

[Transactions of the Fourth All-Union Conference of Forensic Medical Experts] Sbornik trudov chetvertoy Vsesoyuznoy konferentsii sudebnykh medikov. Riga, M-vo zdravookhraneniia SSSR, 1962. 588 p. (MIRA 17:11)

1. Vsesoyuznaya konferentsiya sudebnykh medikov. 4th, 1962. 2. Nauchno-issledovatel'skiy institut sudebnoy meditsiny Ministerstva zdravookhraneniya SSSR (for Gromov, Bronnikova, Kanter, Mityayeva, Rubtsov). 3. Direktor Nauchno-issledovatel'skogo instituta sudebnoy meditsiny Ministerstva zdravookhraneniya SSSR (for Prozorovskiy). 4. Zamestitel' Predsedatelya Uchenogo meditsinskogo soveta Ministerstva zdravookhraneniya RSFSR (for Smol'yaninov).

MITYAYEVA, N.A.

Morphological difference between atelectasis of the lungs and pneumonia in suddenly deceased breast-fed children. Sud.-med. ekspert. 3 no.2[illegible] Apr-Je '60. (MIRA 18:6)

1. Nauchno-issledovatel'skiy institut sudebnoy meditsiny (dir. - prof. V.I.Prozorovskiy) Ministerstva zdravookhraneniya SSSR.

MITYAYEVA, N.A.

Reactions [illegible] injuries. Report N.[illegible] d.-med.ekspert. no.[illegible] [illegible]. (M[illegible] (R[illegible])

1. Nauchno-issledovatel'skiy [illegible] sudebnoy meditsiny (direktor [illegible] prof. V.I.[illegible] Ministerstva zdravookhraneniya [illegible], [illegible].

BAZILEVSKAYA, Nina Aleksandrovna; MITYAYEVA, Yu.P., red.; YERMAKOV, M.S., tekhn. red.

[Theory and methods of plant introduction] Teorii i metody introduktsii rastenii. Moskva, Izd-vo Mosk. univ. 1964. 129 p. (MIRA 17:3)