S/194/61/000/008/001/092
D201/D304

AUTHOR: Chechurina, Ye.N.

TITLE: Methods of determining magnetic properties of ferromagnetic materials when magnetized simultaneously by two alternating fields

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 8, 1961, 6, abstract 8 A41 (Tr. in-tov kom-ta standartov, mer. i izmerit. priborov pri Sov. Min. SSSR, 1960, no. 43(103), 96-110)

TEXT: Methods are considered of determining the dynamic curves of composite magnetization as used in material analysis. The compensation method of measurements is recommended. The basic circuit is given for analysis of samples of materials by the compensation method under the condition of simultaneous magnetization by two alternating currents of different frequencies. Magnetic characteristics of various magnetic materials are given when they are mag-

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D201/D304

Methods of determining magnetic...

netized simultaneously by two alternating fields. Methods are considered of determining the graphs of the dependence of resulting induction on the resulting intensity of the magnetic field. 13 figures. 3 tables. 3 references. [Abstracter's note: Complete translation]

Card 2/2

CHECHURINA, Ye. N.

Standardizing materials with magnetic characteristics. (MIRA 14:6)
Standartizatsiia 25 no.6:41-42 Je '61.
(Metals—Magnetic properties)

VYATKIN, Ye.I., gornyy inzhener; CHECHURIN, Yu. A., gornyy inzhener.

Travelling bin for the removal of rock broken off by blasting.
Gor.zhur. no.12:54 D '56. (MLRA 10:1)

1. Kemerovskiy gornyy institut.
(Mine haulage)

CHECHURINA, Ye. N.

"A Method for Determining the Characteristics of Ferromagnetic Materials by Simultaneous Magnetization by Direct and Alternating Fields." Cand Tech Sci, All-Union Sci Res Inst of Metrology, Leningrad, 1954. (RZhFiz, Feb 55)

SO: Sum. No. 631, 26 Aug 55 - Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (14)

CHERNYSHEV, Ye.T.; CHERNYSHEVA, N.G.; CHECHURINA, Ye.N.

Magnetic characteristics and their measurement under conditions of alternating magnetization. Fiz.met.i metalloved. 1 no.1: 92-100 '55. (MLRA 9:3)

1. Vsesoyuznyy nauchno-issledovatel'skiyy institut metrologii imeni D.I. Mendeleyeva.
(Magnetic materials)

Chechurina, Ye. N.

CHERNYSHEV, Ye.T.; CHECHURINA, Ye.N.

Selection of magnetic characteristics of ferromagnetic materials in simultaneous magnetization by permanent and alternating magnetic fields. Trudy VNIIM no.29:51-57 '56. (MIRA 10:12)
(Ferromagnetism)

112-57-7-13946

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1957, Nr 7, p 16 (USSR)

AUTHOR: Chechurina, Ye. N.

TITLE: Methods for Determining Magnetic Characteristics of Ferromagnetic Materials Simultaneously Magnetized by DC and AC Fields (Metodika opredeleniya magnitnykh kharakteristik ferromagnitnykh materialov pri odnovremennom namagnichivanii postoyannym i peremennym polyami)

PERIODICAL: Tr. Vses. n-i. in-t metrol. (Transactions of the All-Union Science-and-Research Institute of Metrology), 1956, Nr 29 (89), pp 109-126

ABSTRACT: A theoretical and experimental analysis was made of various circuits used for measuring magnetic characteristics in alternating magnetic fields with an additional superimposed constant magnetization. The author has drawn the following conclusions: (1) A suitable, practical method for measuring mean magnetic permeability is to determine the sums of flux density and magnetizing force amplitudes on the basis of the mean values of EMF induced in the measuring winding of the sample and in the secondary winding of the mutual inductance-winding (which is connected in series with the magnetizing winding of the sample); (2) In measuring mean values of induced EMF's, a diode-

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Methods for Determining Magnetic Characteristics of Ferromagnetic Materials . . . .

voltmeter with adjustable bias voltage would be suitable; such an instrument permits measuring mean values of both badly distorted EMF's and constant EMF's with an error of 1% or less; (3) For testing materials with high electric resistivity at frequencies of 50 cps or lower and sinusoidal field strength, the method of measuring mean EMF's can be replaced by the ballistic method; (4) In cases where it is necessary to know the relation between the permeability (determined from the first harmonics of flux density and magnetizing force) and the permanent magnetizing force, it is expedient to use the compensation method, suitable for both the sinusoidal flux density and the sinusoidal magnetizing force; (5) With proper equipment, the error in determining the mean permeability by the method of measuring mean EMF values does not exceed $\pm$ 2.5%; (6) Additional errors due to insufficient inductance of DC circuit, nonsinusoidal magnetizing force or flux density, incomplete demagnetization of the sample, etc., can be practically eliminated; (7) For determining the relationship between the peak value of the flux-density second harmonic and the DC magnetizing force, it is practical to use the method of measuring mean

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Methods for Determining Magnetic Characteristics of Ferromagnetic Materials 112-57-7-13946

values of the second harmonic of induced EMF's; a diode-voltmeter combined with a resonant filter and an amplifier can be expediently used.

L. Sh. K.

Card 3/3

Chechurina, Ye. N.

ARUTYUNOV, V.P.; DOLINSKIY, Ye.F.; KOLOSOV, A.K.; MAKSIMOV, L.M.; ROMANOVA, M.F.; RUDO, N.M.; CHECHURINA, Ye.N.; SHIROKOV, K.P.; SHRAMKOV, Ye.C.; YANOVSKIY, B.M.

E.T. Chernyshev; 50th birthday anniversary and 30th anniversary of scientific and pedagogic activities. Izm. tekh. no.3:91 My-Je '57. (Chernyshev, Evgenii Titovich, 1907-) (MLRA 10:8)

AUTHORS: Levin, L.S.; Chechurina, Ye.N. SOV-115-58-4-27/45

TITLE: The UFM-1 Apparatus for Testing Magnetic Materials (Ustanovka UFM-1 dlya ispytaniya magnitnykh materialov)

PERIODICAL: Izmeritel'naya tekhnika, 1958, Nr 4, pp 65-68 (USSR)

ABSTRACT: The UFM-1 Universal Apparatus was designed in the Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii im. Mendeleyeva (The All-Union Research Institute for Metrology imeni D.I. Mendeleyev). It is used for determining the magnetic characteristics of materials under conditions of combined magnetization in a frequency range of 50 to 2,500 c, both for individual ring-type objects and for objects which constitute the cores of single-phase and three-phase magnetic amplifiers. With this apparatus, characteristics can be determined in conditions of: sinusoidal intensity of the ac field, with sinusoidal induction, or for taking measurements under conditions of a distorted current curve or induced emf. The construction, design and operation of the apparatus are described. For measuring losses in the appa-

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The UFM-1 Apparatus for Testing Magnetic Materials SOV-115-58-4-27/45

ratus a thermo-wattmeter, produced at the VNIIM by D.I. Zorin and A.Ya. Bezikovich, is used. The definition errors under various conditions are also analysed. There are 3 circuit diagrams and 5 Soviet references.

1. Magnetic materials--Test methods

Card 2/2

CHECHURINA, Ye.M.

Peculiarities of testing ferromagnetic materials by magnetizing them simultaneously in permanent and alternating fields. Trudy VNIIM no.38:126-135 '59. (MIRA 13:4)
(Ferromagnetism)

CHERNYSHEV, Ye.T.; CHERNYSHEVA, N.G.; CHECHURINA, Ye.N.

Interlaboratory comparison of standard measures of magnetic flux, measuring coils, and normal samples of magnetic materials. Trudy inst. Kom. stand., mer i izm. prib. no.43:40-42 '60. (MIRA 14:7)

(Magnetic measurements)

CHERNYSHEVA, N.G.; CHECHURINA, Ye.N.

Apparatus for testing samples of ferromagnetic materials by the use of an up to 10 kHz frequency alternating current with simultaneous magnetization by a constant and a variable field. Trudy inst. Kom. stand., mer i izm. prib. no.43:56-68 '60. (MIRA 14:7)

(Magnetic measurements)

S/058/61/000/007/056/086
A001/A101

AUTHOR: Chechurina, Ye.N.

TITLE: On the problem of measuring differential magnetic permeability

PERIODICAL: Referativnyy zhurnal. Fizika, no. 7, 1961, 283, abstract 7E479 ("Tr. in-tov Kom-ta standartov, mer i izmerit. priborov pri Sov. Min. SSSR", 1960, no. 43 (103), 90 - 95)

TEXT: The author considers the method of measuring maximum differential permeability on dynamical hysteresis loop. Calculation formulae are presented for a particular case of magnetizing the specimens by a sinusoidal magnetic field, and the basic scheme of determining $\mu_{d,max}$ is given. The toroidal specimen is magnetized by an alternate magnetic field induced by a primary coil wound on it, and emf induced in the secondary coil is measured with an amplitude voltmeter. The relative error of measurement is determined by the errors of the measuring instruments, and amounts in the present case to 5-6%. The results are presented of measuring $\mu_{d,max}$ for specimens of steels Э 330 (E330), 80НХС (80 NKhS), 79НМА (79NMA) and 50НП (50NP) at frequencies of 50, 400 and 1,000 cps and various values of H amplitude.

[Abstracter's note: Complete translation]

L. Vinokurova

Card 1/1

CHECHURINA, Ye.N.

Methods of determining magnetic characteristics of ferromagnetic materials in case of simultaneous magnetization by two variable fields. Trudy inst. Kom. stand., mer i izm. prib. no.43:96-110 '60. (MIRA 14:7)

(Magnetic measurements)

CHERNYSHEVA, N.G.; CHECHURINA, Ye.N.

Conference on methods and equipment for testing magnetic materials. Zav.lab. 27 no.11:1436-1438 '61. (MIRA 14:10)
(Magnetic materials--Congresses)

CHERNYSHEV, Ye.T.; CHERNYSHEVA, N.G.; CHECHURINA, Ye.N.; BAL'YAN, L., red.; KASHIRIN, A., tekhn. red.

[Magnetic measurements using alternating and direct currents] Magnitnye izmereniia na postoiannom i peremennom toke. Moskva, Standartgiz, 1962. 183 p. (MIRA 16:1)
(Magnetic measurements) (Magnetic fields)
(Electric measurements)

CHERNYSHEV, Ye.T.; CHECHURINA, Ye.N.; CHERNYSHEVA, N.G.; ORALOVA, I.A.

Research by the All-Union Research Institute of Metrology on the establishment of methods and creation of equipment for testing standard specimens of ferromagnetic materials by alternating current. Trudy inst. Kom.stand.mer i izm. prib no.64:145-159 '62. (MIRA 16:5)

(Ferromagnetism—Measurement)
(Magnetic measurements—Equipment and supplies)

CHECHURINA, Ye.N.

International system of units in magnetic measurement practice. Trudy inst.Kom.stand., mer i izm.prib. no.72:5-16 '63. (MIRA 16:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii imeni Mendeleyeva.

(Magnetic measurements)

BOGUSLAVSKIY, Moisey Grigor'yevich, kand. tekhn.nauk; KREMLEVSKIY, Panteleymon Petrovich, kand. tekhn. nauk; OLEYNIK, Boris Nikolayevich, kand. tekhn. nauk; CHECHURINA, Yekaterina Nikolayevna, kand. tekhn.nauk; SHIROKOV, Konstantin Pavlovich, kand. tekhn.nauk; BURDUN, G.D., doktor tekhn. nauk, retsenzent; RYSKO, S.Ya., red.izd-va; MEDVEDEV, L.Ya., tekhn. red.

[Tables for the conversion of measurement units] Tablitsy perevoda edinits izmerenii. [By] M.G.Boguslavskii i dr. Moskva, Standartgiz, 1963. 116 p. (MIRA 17:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii im. D.I.Mendeleyeva (for Boguslavskiy, Kremlevskiy, Oleynik, Chechurina, Shirokov).

CHECHURINA, Ye.N.; HENENSON, N.M.; VINOGRADOVA, L.S.

Measurement of the coercive force of materials. Zav. lab. 29 no.6:722-724 '63. (MIRA 16:6)

1. Leningradskiy gosudarstvennyy zavod "Radist" i Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii imeni Mendeleyeva.

(Materials—Magnetic properties)

ACCESSION NR: AP4038454 S/0115/64/000/004/0046/0049

AUTHOR: Studentsov, N. V.; Cherny*sheva, N. G.; Chechurina, Ye. N.

TITLE: Accurate measurements of magnetic parameters in science and technology

SOURCE: Izmeritel'naya tekhnika, no. 4, 1964, 46-49

TOPIC TAGS: magnetism, magnetism measurement, nuclear resonance, paramagnetic resonance

ABSTRACT: The following magnetometric standards are presently used in the USSR; the unit of magnetic field intensity is established by means of a quartz Helmholtz coil 312 mm in diameter and having an accuracy of 0.001%. Magnetic flux is established with a Campbell coil of 300 mm and 480 mm diameter, for the primary and secondary coils, respectively, with an error of 0.004%. These values are then transferred to industrial measuring instruments with an accuracy varying from 0.01 to 0.1%. Recently, the phenomenon of magnetic nuclear resonance has come into use as a standard for measuring the

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ACCESSION NR: AP4038454

intensity of magnetic fields from tens to millions of amps per m with an accuracy of a few thousanths of one percent. Other phenomena such as paramagnetic resonance and optical pumping have also been used for highly accurate measurements of very weak magnetic fields. Current scientific developments call for instruments capable of measuring the geomagnetic field and also extraterrestial magnetic fields with an accuracy of 1×10^{-3} amp/m, that is, about 0.002%. In 1964 at the National Economy Fair, instruments were displayed for the determination of atomic constants (gyromagnetic ratio) designed by VNIIM (All-Union Scientific Research Institute for Metronomy) and KhGIMIP (Kharkov State Institute of Measures and Measuring Instruments). One device measures weak magnetic fields within an accuracy of 0.002%; another instrument, the IMP-3, is used to measure the gyromagnetic ratio from 40 to 1200 kiloamp/meter. An instrument similar to the IMP-3, with a range of 1—10 kamp/m and accurate to within 0.05%, was also shown. Some of the new developments scheduled for the next 10—15 yr to satisfy the demands of Soviet economy include a change-over to magnetic standards based on elementary particle constants with an accuracy of 0.0005%, the general use of the nuclear resonance method and optical pumping

Card 2/3

ACCESSION NR: AP4038454

for magnetic field measurements, and the adoption of new standards for the testing of magnetic materials. Orig. art. has: 1 formula

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 12Jun64 ENCL: 00

SUB CODE: EM, NP NO REF SOV: 000 OTHER: 000

Card 3/3

ACCESSION NR: AP4038454

for magnetic field measurements, and the adoption of new standards for the testing of magnetic materials. Orig. art. has: 1 formula

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 12Jun64 ENCL: 00

SUB CODE: EM,NP NO REF SOV: 000 OTHER: 000

Card 3/3

ARTAMONOV, Ye.V.; NIKITINA, S.B.; CHECHURINA, Ye.N.

Determination of the hysteresis curves of ferromagnetic materials. Nov.nauch.-issl.rab.po.metr. VNIIM no.5:4-6 '64. (MIRA 18:3)

IVANOV, G.F.; CHECHURINA, Ye.N.

Testing of a DSShU-M unit. Nov.nauch.-issl.rab.po.metr. VNIIM no.5:14-17 '64. (MIRA 18:3)

CHECHURINA, Ye.N.

International System of Units for electrical and magnetic measurements. Izm. tekh. no.10:54-57 O '64 (MIRA 18:2)

CHERNYSHEV, Ye.T.; CHECHURINA, Ye.N.

Present status and future development of magnetic measurements.
Izm. tekh. no.12:20-24 D '64. (MIRA 18:4)

L 34009-66

ACC NR: AR6017188 SOURCE CODE: UR/0058/65/000/012/A029/A029

43
B

AUTHOR: Chechurina, Ye. N.

TITLE: Magnetic measurement of the characteristics of materials in alternating fields

SOURCE: Ref. zh. Fizika, Abs 12A290

REF SOURCE: Tr. in-tov Gos. kom-ta standartov, mer i izmerit. priborov SSSR, vyp. 76(136), 1965, 76-82

TOPIC TAGS: scientific standard, metrology, magnetic field measurement, magnetism research facility, calorimeter, ultrasonic inspection

ABSTRACT: The article describes briefly apparatus constructed in the magnetic laboratory of VNIIM in recent years: 1) apparatus for testing standard samples with 50 cps - 10 kcs ac and under simultaneous magnetization in constant and alternating fields; 2) absolute and differential calorimeters for the determination of total losses in samples of ferromagnetic materials with error 1 - 2%; 3) bridge setup for the determination of the characteristics of magnetically-soft materials at ultrasound frequencies; 4) apparatus which makes it possible to determine the instantaneous values of the induction and magnetic field intensity in the frequency range 200 cps - 10 kcs with instrumental error 3 - 7%. Bibliography, 28 titles. L. Ivanova. [Translation of abstract]

SUB CODE: 20

Card 1/1

ACC NR: AR6028416 SOURCE CODE: UR/0196/66/000/005/B002/B002

AUTHOR: Astapenok, M. F.; Ignatovskaya, G. Ya.; Chechurina, Ye, N.

TITLE: Determining the magnetic characteristics of the material of fabricated magnets

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 5B8

REF SOURCE: Tr. in-tov Gos. kom-ta standartov, mer i izmerit. priborov SSSR, vyp. 79(139), 1965, 109-117

TOPIC TAGS: permanent magnet material, magnetic property

ABSTRACT: The principal results are reported of an investigation of permanent magnets of various shapes used in electric measuring instruments. To reduce the error in determining B, the search coil encompassing the neutral cross-section of the magnet should be shaped according to this cross-section and should be placed snugly to the magnet. In measuring H, the error appreciably depends on the search-coil shape. Miniature field coils (about 5 x 3 x 2.5-mm) yield best results. In dealing with shaped magnets, pole pieces providing for good magnetic contact with the permeameter yoke are necessary. Most instrument-type fabricated magnets permit determining their properties according to the above method, the error in measuring B and H being 2--5% and the error in measuring magnetic energy product, 5--7%. Testing of several magnets revealed a wide spread (up to 50%) in their magnetic properties which depend on the melt. Six figures, one table. Bibliography of 4 titles. L. Kazarnovskiy [Translation of abstract]

SUB CODE: 09, 11

Card 1/1 UDC: 621.318.2

CHECHURO, A.N.; KOLESNIK, I.L.

Errors in controlling the flow of gases and material distribution in the blast furnace top. Metallurg 5 no.8:7-8 Ag '60. (MIRA 13:7)

1. Zavod im. Dzerzhinskogo.
(Blast furnaces)

GOL'DFARB, E.M., inzh.; TAYTS, N.Yu., inzh.; LEGOVETS, L.V., inzh.; SOROKIN, A.A., inzh.; CHECHURO, A.N., inzh.; POLETAYEV, B.L., inzh.; YAROSHEVSKIY, N.D., inzh.

Increasing the heat capacity of blast furnace air preheaters. (MIRA 14:10)
Biul.TSIICHM no.4:9-13 '61.
(Blast furnaces) (Air preheaters)

CHERNOV, V.N.; CHECHURO, A.N.

Optimum composition of blast furnace slag in southern plants. Metallurg 6 no.4:6-8 Ap '61. (MIRA 14:3)

1. Dneprodzerzhinskiy metallurgicheskiy institut i Zavod imeni Dzerzhinskogo.
(Russia, South--Metallurgical plants)
(Slag--Analysis)

CHECHURO, A.N., laureat Leninskoy premii; KOLESNIK, I.L., starshiy proizvodstvennyy master; YASHIN, Yu.F.

Removal of flame pulsation in air preheaters. Metallurg 6 no.9:3-4 S '61. (MIRA 14:9)

1. Nachal'nik domennogo tsekha zavoda imeni Dzerzhinskogo (for Chechuro). 2. Rukovoditel' tekhnologicheskoy gruppy zavoda imeni Dzerzhinskogo (for Yashin).
(Air preheaters) (Flame)

GOTLIB, A.D., prof.; POLOVCHENKO, I.G., kand.tekhn.nauk; LEVCHENKO, V.Ye., inzh.; CHECHURO, A.N., inzh.; KHARCHENKO, N.M., inzh.; YASHIN, Yu.F., inzh.

Blast furnace operations with use of screened sinter. Biul. TSIICHM no.2:12-15 '61. (MIRA 14:9)
(Blast furnaces)

LOGINOV, V.I.; CHECHURO, A.M.; DOLGOV, V.M.

Blowing oxygen deep into a blast furnace hearth. Metallurg 7 no.12: 4-8 D '62. (MIRA 15:12)

1. Zavod im. Dzerzhinskogo i Dneprodzerzhinskiy zavod-vtuz.
(Blast furnaces) (Oxygen--Industrial applications)

LOGINOV, V.I., kand.tekhn.nauk; CHECHURO, A.N. inzh.

Optima conditions of blast furnace smelting. Stal' 23 no.7:581-585 Jl '63. (MIRA 16:9)

1. Zavod im. Dzerzhinskogo i Dneprodzerzhinskiy zavod-vtuz.
(Blast furnaces)

VOLOVIK, G.A.; POLOVCHENKO, I.G.; CHECHURO, A.N.

Conditions of tapping the smelting products and the desulfuration processes in the furnace. Metallurg 8 no.10:4-8 O '63. (MIRA 16:12)

LOGINOV, V.I.; CHECHURO, A.N.; DOLGOV, V.M.

Operation of a blast furnace with air tuyeres of variable cross section. Izv. vys. ucheb. zav.; chern. met. 7 no.10: 22-27 '64. (MIRA 17:11)

1. Dneprodzerzhinskiy metallurgicheskiy zavod-vtuz.

LOGINOV, V.I.; CHECHURO, A.N.

Acceleration of blast furnace smelting. Stal' 24 no.5: 392-395 My '64. (MIRA 17:12)

1. Dneprovskiy metallurgicheskiy zavod im. Dzerzhinskogo i Dneprodzerzhinskiy metallurgicheskiy [illegible]-vtuz.

CHECHURO, A.N., inzh.; KOLESNIK, I.L., inzh.; YASHIN, Yu.F.

Eliminating the pulsation burning of gas in air preheaters.
Stal' 24 no.5:406-408 My '64. (MIRA 17:12)

1. Dneprovskiy metallurgicheskiy zavod im. Dzerzhinskogo.

GOTLIB, A.D., doktor tekhn. nauk; GIMMEL'FARB, A.A., kand. tekhn. nauk; YEFIMENKO, G.G., kand. tekhn. nauk; LAPA, A.M., kand. tekhn. nauk; POLOVCHENKO, I.G., kand. tekhn. nauk; GRISHKO, V.A., inzh.; KHARCHENKO, N.M., inzh.; CHECHURO, A.N., inzh.

Automatic control of temperature conditions in a blast furnace. Stal' 25 no.7:585-589 Jl '65. (MIRA 18:7)

1. Dnepropetrovskiy metallurgicheskiy institut i metallurgicheskiy zavod im. Dzerzhinskogo.

CHERNOV, Nikolay Nikitich; CHECHURO, Anatoliy Nikolayevich

[Blast furnace operation] Vedenie domennoi pechi. Moskva, Metallurgiia, 1965. 223 p. (MIRA 18:8)

CHERNOV, Nikolay Nikitich; CHECHURO, Anatoliy Nikolayevich

[Operation of an open-hearth furnace] Vedenie domennoi pechi. Moskva, Metallurgiia, 1965. 223 p.
(MIRA 18:7)

L 22139-66 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)

ACC NR: AP6012947 SOURCE CODE: UR/0133/65/000/007/0585/0589

AUTHOR: Gotlib, A. D. (Doctor of technical sciences); Girmel'farb, A. A. (Candidate of technical sciences); Yefimenko, G. G. (Candidate of technical sciences); Polovchenko, I. G. (Candidate of technical sciences); Lapa, A. M. (Candidate of technical sciences); Grishko, V. A. (Engineer); Chechuro, A. N. (Engineer); Kharchenko, N. M. (Engineer)

ORG: Dnepropetrovsk Metallurgical Institute (Dnepropetrovskiy metallurgicheskiy institut); Plant im. Dzerzhinskiy (Zavod)

TITLE: Automatic control of the thermal state of a blast furnace

SOURCE: Stal', no. 7, 1965, 585-589

TOPIC TAGS: automatic control, blast furnace, algorithm, digital computer

ABSTRACT: The currently used methods for controlling the thermal state of a blast furnace have considerable deficiencies. There is considerable delay in receipt of data for control changes. Control should be performed directly on the change in thermal and reductive work of the gases, depending on their distribution in the charge and their movement through it. Theoretical principles for thermal control by composition of flue gas have been developed: a) minimum usage of coke for smelting cast iron of a given composition under given conditions of charge material and melting is defined, b) these parameters of the process are directly maintained at a level necessary to produce iron with minimum deviation from the given composition when all heat reserves of the process are used.

Card 1/2

ACC NR: AP6012947

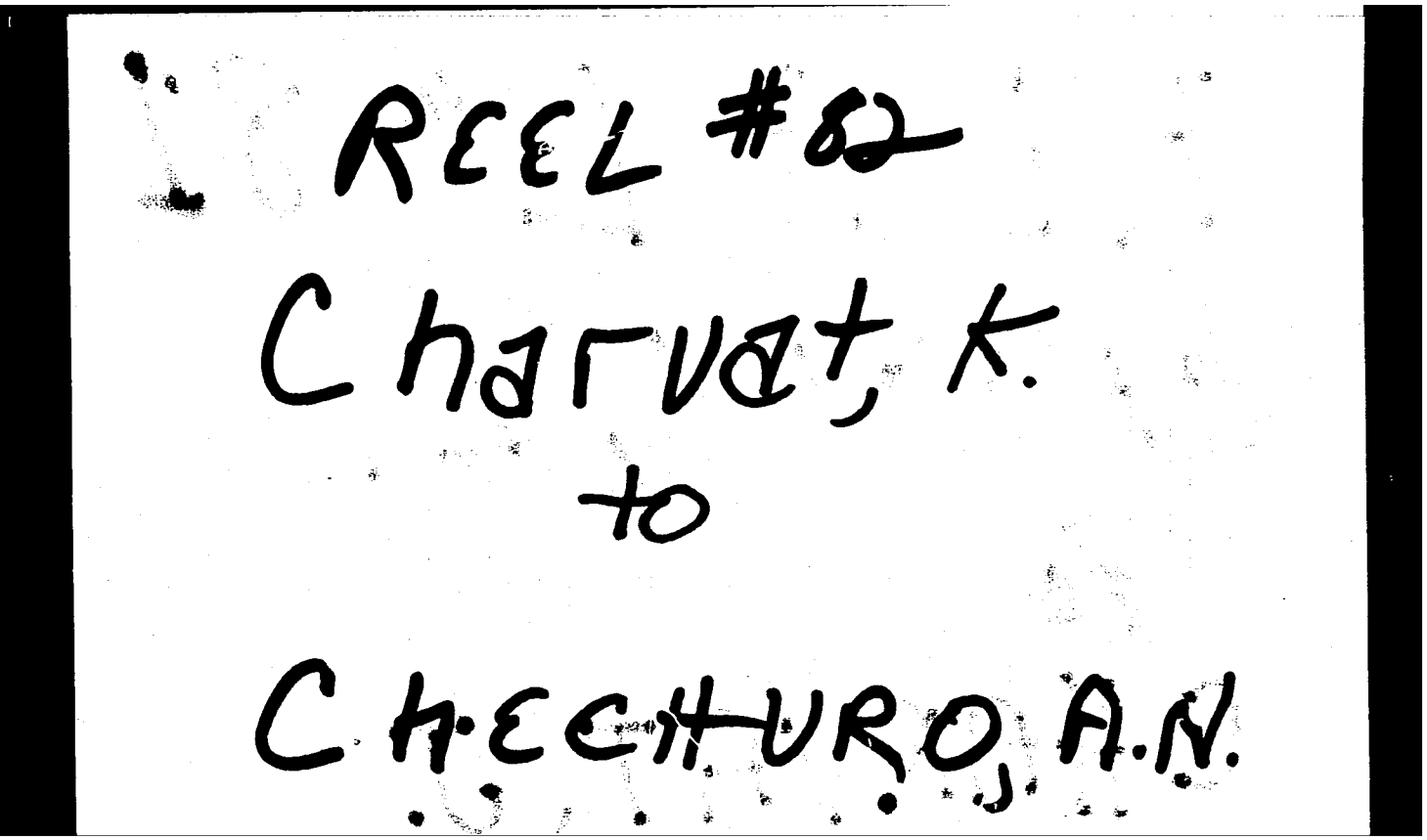
On the basis of these considerations, an algorithm for control of the thermal state of a furnace was developed by the Lisichan Scientific Research Institute for Computers for use in the "Sovetchik Master" (SM-2) computer at blast furnace A of the plant imeni Dzerzhinskiy. This device is a digital computer which performs the mathematical and logical processing of input information on the basis of this algorithm.

During an 18-day trial period in May and a 36-day trial period in October-November, 1963, the computer recommended 108 changes in coke quantity and 144 changes in blast temperature. The results were positive; the thermal state of the furnace was mainly disrupted only when the recommendations were not fulfilled and during changes in loading without recommendation by the computer.

The recommendation control considerably increased consistency in output composition. Coke usage was decreased by 2.5%. The algorithm can be used only when the furnace is under regular use. Engineer S. Z. Nemchenko, Engineer A. S. Skorobagatov, Engineer M. I. Obuvalin, Engineer T. I. Slamchinskaya, Engineer A. M. Yunchik, Engineer Yu. M. Samarets, and Engineer D. S. Kalashnikov participated in the work. Orig. art. has: 3 figures and 2 tables. [JPRS]

SUB CODE: 13, 09 / SUBM DATE: none / ORIG REF: 004

Card 2/2 BK



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