SHATENSHTEYN, V.G.; LEYTMAN, Ya.Z.; TEMNIK, V.G.

Effect of the DB wetting agnet on the increase of the bulk density of the coal charge. Koks i khim. no.2:11-13 '64. (MIRA 17:4)

1. Kommunarskiy koksokhimicheskiy zavod (for Shatenshteyn, Leytman).
2. Kommunarskiy gorno-metallurgicheskiy institut (for Temnik).

Williams, ...

Reduction of high-temperature resistance in a laboratory unit.
Izv. Sib. Otd. ... 1959-60 ...

1. Permanently below-thick checkly maved.

SHAFER, YU. G.

TIXOL" A Unique Flash of Intensity of Cosmic Rays. Unikal'-
n ia vspyshka intensivnosti kosmicheskikh luchei. (Russian.)
A. I. Kuzmin, G. V. Skripin, G. V. Tiamutova, and Iu. G.
Shafer. Doklady Akademii Nauk SSSR, v. 108, no 1, May
1956, p. 88-88.

Reports of a cosmic ray flash recorded at Iakutsk during which
intensity of the hard component exceeded the average by
20%. Diagram, graphs. 1 ref.

L 41248-65   EWP(k)/EWP(z)/EWT(d)/EWT(m)/EWP(h)/EWP(b)/EWA(d)/EWP(l)/EWP(v)/EWP(t)

ACCESSION NR: AT4042606   Pf-4   MJW/JD   S/2563/64/000/233/0030/0035

AUTHOR: Shaterik, M. A.

TITLE: Drilling of heat resistant steel EI787

SOURCE: Leningrad. Politekhnicheskiy institut, Trudy, no. 233, 1964. Avtomatizatsiya i tekhnologiya mashinostroyeniya (Automation and technology of machinery manufacturing processes), 30-35

TOPIC TAGS: drilling, steel drilling, drilling speed, drill angle, drilling lubricant, drill durability, drilling coolant / steel EI787

ABSTRACT: Drilling is one of the most difficult technological operations, and the heat-resistant steel EI787 is, in this respect, one of the most difficult materials of the austenite class. The author studied techniques for drilling this steel on the vertical drilling stand 2135 powered by a 4.6 kW motor. Graphs show the durability of various drills as a function of 1) the lubricant-coolant composition; 2) the magnitude of the cutting point angle; 3) the length of the working section; and 4) the magnitude of the back angle at the periphery of the drill. The best drilling lubricant was found to be industrial oil 20 with admixtures of LZ-Fkh-2

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L 41248-65

ACCESSION NR: AT4042606

(a chlorine-containing phosphinic acid ester), or sulfofrezol mixed with 10% kerosene. The article concludes with data on the geometry of drills recommended for the processing of EI787 heat-resistant steel, and with the cutting rates of the recommended tools. The cutting rate V in m/min. is determined by the following formula

$$V = \frac{1.31 \cdot d^{0.44}}{T^{0.25} \cdot s^{0.44}} \text{ M/MUH.}$$

where T, d and s are the stability of the drill (in minutes), its diameter (in mm) and bite (mm/revolution), respectively. Orig. art. has: 1 formula, 5 figures, and 4 tables.

ASSOCIATION: Leningradskiy politekhnicheskiy institut imeni M. I. Kalinina (Leningrad polytechnic institute)

SUBMITTED: 00   ENCL: 00   SUB CODE: IE

NO REF SOV: 000   OTHER: 000

Card 2/2

SHAPSHINA A.I.: GRIGOR'YEV, L.K.

Engineer, "The Nitration of High-Speed Steel Tools in Cyanide Salt Baths,"
Stank i Instrument, 10, No 1, 1939

Report I-1505, 23 Oct. 1951

SHATERIN, M.A., inzh.

Automatic control of the butt welding of tools. Svar. proizv.
no.12:26-28 D '61. (MIRA 14:12)

1. Sestroretskiy instrumental'nyy zavod imeni Voskova.
(Tool steel—Welding)
(Automatic control)

SHATERIN, N.A.

Drilling the semi-submerged BUN tunnel. Trudy LPI n...53:20-35 '64.
(MIRA 17:10)

USSR/... of ... Physiology. Digestion ...

Abs Jour: ... ..., 1958, 15500

Author   : ... Arkov, ...
Inst   : ...
Titl   : ... Disturbances of Intestinal Absorption by Radiation
           Sickness in Animals, Maintained on Various Food Rations

Orig Pub : ... radiologiia, 195?, ..., v. 4, 61-67.

Abstract: Absorption of ... and 0.5% solution of Rhodonol in
          an isolated Tiri loop of the intestine was investigated
          in dogs on fasting and one hour after feeding. The ani-
          mals were maintained on "physiological", liver or
          milk-... diets, in which the proteins of animal origin
          ... derived essentially from meat, liver or milk and
          ... Following X-ray irradiation (350, 400, 500 r)
          ... dogs with acute radiation sickness, subsisting on

Card   : 1/2   7?

USSR/Human and Animal Physiology. Digestion.

Abs Jour: Ref Zhur Biol., No 8, 1958, 36600.

the "physiological" and "liver" diets, exhibited periodical
disturbances against the background of a general depression
of absorption, and alimentary stimulation of the animals
still more decreased the rate of absorption. In dogs
maintained on the "milk-egg" diet, as well as on the
"physiological" and "liver" diets, enriched with vitamins
(during the acute and subacute disturbances of the absorptive processes
process) were less pronounced.

Card   : 2/2

SHATERKOV, V.I., inzh.

Investigating lateral rigidity of rails within switches.
Trudy DIIT no.27:290-300 ' 58.   (MIRA 12:1)
(Railroads--Rails) (Railroads--Switches)

SHATERKOV, V.I. kand.tekhr.nauk

Some problems in the strength analysis of switches. Trudy
DIIT no.30:209-214 '60.   (MIRA 14:12)
        (Railroads--Switches)

FRISHMAN, M.A., doktor tekhn.nauk; SHATERKOV, V.I., kand.tekhn.nauk; SHKODA, Ye.G., inzh.; LIPOVSKIY, R.S., kand.tekhn.nauk

Eliminating the causes of crack formation in switch rails with squeezed out heels. Vest. TSNII MPS 20 no.5:50-52 '62.
(MIRA 15:8)

1. Dnepropetrovskiy institut inzhenerov zheleznodorozhnogo transporta.
(Railroads--Rails--Defects)

SEMENCHENKO, F.Ya., Geroy Sotsialisticheskogo truda, starshiy dorozhnyy master; ISAKOV, I.F., kand. tekhn. nauk; KOBETS, N.G., starshiy dorozhnyy master; VOLOSHKO, Yu.D., kand. tekhn. nauk; CHERKASSKIY, M.M., inzh.; SHATERKOV, V.I., kand. tekhn. nauk; LIPOVSKIY, R.S., kand.tekhn.nauk; FRISHMAN, M.A., prof., red.; POTOTSKIY, G.I., inzh., red.; VOROB'YEVA, L.V., tekhn. red.

[Current maintenance and repair of tracks]Tekushchee soderzhanie i remont puti; opyt puteitsev Nizhnedneprovsk-Uzlovskoi distantsii Pridneprovskoi dorogi. Moskva, Transzheldorizdat, 1962. 55 p.

(MIRA 16:1)

(Railroads--Maintenance and repair)

FRISHMAN, M.A., prof. (Dnepropetrovsk); SHATERKOV, V.I., dotsent
        (Dnepropetrovsk); VOLOSHKO, Yu.D., dotsent (Dnepropetrovsk);
        ORLOVSKIY, A.N., inzh. (Dnepropetrovsk)

Performance of switches laid on reinforced concrete slabs. Put'
i put.khoz. 7 no.7:11-12 '63.   (MIRA 16:10)

SHATERNIK,S., urach

New methods in treatment for worms. Rab.i sial.31 no.10:23 O'55.
(MLRA 8:12)

(Worms, Intestinal and parasitic)

SHATERNIKOV, A. I.

a.- Culture-Movement and Sanitary

Titari fthe ars-Editing conference of Observators, No. 8, 1952.

A. MONTHLY LIST OF RUSSIAN ACCESSIONS, Library of Congress, August 1952. Uncl.

SHATENIKO , F. F.

Bee Culture

Stocking Bee Bread.
Pchelovodstvo 29, No. 4, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1952.   UNCLASSIFIED.

SHATERNIKOV   V. A.

TURPAYEV, T.M.; SHATERNIKOV, V.A.

Role of acetylcholine on the negative chronotropic action of the
vagus nerve on the heart. Biul.eksp.biol. i med. 38 no.8:3-8 Ag '54.
(MLRA 7:9)

1. Iz laboratorii obshchey i sravnitel'noy fiziologii (zav. chlen-
korrespondent AN SSSR Kh.S.Koshtoyants) Instituta morfologii zhivot-
nykh imeni A.N.Severtsova (dir. chlen-korrespondent AN SSSR G.K.
Khrushchov) AN SSSR, Moskva.
          (ACETYLCHOLINE, effects,
              on vagus nerve negative chronotropic action on heart)
          (NERVES, VAGUS, effect of drugs on,
              acetylcholine, on vagus negative chronotropic action on heart)
          (HEART, physiology,
              eff. of acetylcholine on vagus nerve negative chronotropic
              action on heart)

SHATERNIKOV, V. A.

"Disturbances of the Processes of Absorption in Small Intestine
During Radiation Injury of Animals Maintained on Various Food
Rations," by V. A. Shaternikov, Meditsinskaya Radiologiya,
Vol 1, No 4, Jul/Aug 56, pp 61-67

Tests were conducted on 18 dogs who were subjected to a preliminary
operation whereupon the extreme end of the small intestine was isolated
and a metallic fistula inserted. The experimental animals were then sub-
jected to 350, 400, and 500 r and then maintained on "physiological,"
"hepatic," or "milk-egg" diets.

During the acute form of radiation sickness in dogs that had been
maintained on "physiological" and "hepatic" rations there were observed
acute wavelike changes in the absorption rate of glycine against a back-
ground of inhibition of the absorptive capacity of the small intestine.

During the subacute course of radiation sickness in dogs that had
been maintained on "physiological" and "hepatic" rations, there was observed
a general increase of the intensity of absorption against a background in
which acute wavelike disturbances of the absorptive activity of the
small intestine occurred.

After the action of ionizing radiation food stimulation of animals led to additional decrease of the rate of absorption in the small intestine.

The "milk-egg" ration exerted a normalizing effect on the processes of glycine absorption in irradiated animals.

Enriching the "physiological" and "milk-egg" rations with vitamin P, PP, and C exerted a positive effect in normalizing the absorptive activity of the small intestine.

GRACHIN, V.A., Cand Bio Sci--(diss) "Effect of X-ray irradi-ation on the absorption of glucose in the small intestine."

Kaz, 1957. 12 pp (Med Sci USSR), 250 copies (KL,39-58,125)

SHATERNIKOV, V.A.

Mechanism of the disruption of intestinal absorption of glycocell following x-irradiation [with summary in English]. Med.rad. 3 no.3 37-42 My-Je '58
(MIRA 11:7)
        (GLYCINE,
            intestinal absorp., eff. of x-rays in animals (Rus))
        (INTESTINES, physiol.
            glycine absorp., eff. of x-rays in animals (Rus))
        (ROENTGEN RAYS, effects
            on intestinal glycine absorp. (Rus))

SHATERNIKOV, V.A.

Metabolism of lipids in radiation sickness. Med. rad. 5 no.12:
61-68 '60.   (MIRA 14:3)
        (LIPID METABOLISM)   (RADIATION SICKNESS)

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69512

AUTHORS: Smirnov, K. V., Shaternikov, V. A.

S/020/60/131/04/067/073
B011/B002

TITLE: Acetylcholine Appearing in the Blood Under the Influence of
Ionizing Radiation

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 4, pp 961-963 (USSR)

ABSTRACT: This paper is ment to explain the participation of small intestine
and liver in the metabolism of acetylcholine in the action of
γ-irradiation. The experiments were made with three dogs
angiostomized according to Ye. S. London's method (modification by
the authors). Isolated sections of the small intestine were used
as tubules. Stomata were fixed at vena portae and hepatica. 18 hours
after feeding, blood was taken from arteria femoralis and the two
veins mentioned. For 5 minutes, 2 ml of this blood were extracted
with 8 ml of Ringer's solution (pH of 7.6) and eserine $(2 \cdot 10^{-5})$
under heating by means of a boiling bath. The extract was tested
in a muscle of the back of the leech. The difference between the
muscle contraction in the experiment and in the control (control
with addition of active cholinesterase) corresponded to the
contraction achieved under the action of acetylcholine contained
in the blood. It was found that the arterial peripheral blood
flowing off from intestine and liver in all three dogs not exposed

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Acetylcholine Appearing in the Blood Under the
Influence of Ionizing Radiation

S/020/60/131/04/067/073
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to irradiation, contained only traces of acetylcholine. After this
has been found out, animals not treated before, were completely
exposed to γ-rays of Co^{60} (dose of 300 r, dose intensity of 450-
460 r/min). Table 1 gives the amounts of acetylcholine contained
in the individual blood vessels. Already 2 hours after irradiation
on empty stomach, acetylcholine appeared in the blood of intestines
and livers of all dogs examined. Acetylcholine however, was complete-
ly stored by the liver. On the second day even more acetylcholine
was secreted by the intestine into the blood stream, its con-
centration in the vena portae increased up to 10-15 $\mu g\%$. In two dogs,
acetylcholine not only penetrated the liver, but was also found
in the arterial blood. Six days after irradiation, the content of
acetylcholine in the vena portae become somewhat lower in two of
the dogs, while the liver of one of them, still let it pass. This
dog soon died. Another dog showed such an escape of acetylcholine
on the 9th day after irradiation. The vena portae of all dogs
contained acetylcholine until the observation was terminated. The
constant transportation of acetylcholine into the liver cannot be
ineffective. A certain favorable influence on the metabolism of
the liver seems quite possible. A negative influence is also
possible, but special investigations are necessary to find this out.

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Acetylcholine Appearing in the Blood Under the
Influence of Ionizing Radiation

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S/020/60/131/04/067/073
B011/B002

N. Ye. Kuznetsova, Ye. N. Petrovnina, N. N. Demin, A. F. Platonova-
Pokrovskaya, N. Ye. Ponomarenko are mentioned in the paper. There
are 1 table and 19 references, 14 of which are Soviet.

PRESENTED: November 19, 1959, by L. S. Shtern, Academician

SUBMITTED: November 18, 1959

Card 3/3

SMIRNOV, K.V.; SHATERNIKOV, V.A.

Effect of external ionizing irradiation on heptic and intestinal
participation in lipid metabolism. Vop.med.khim. 6 no.5:464-468
S-O '60.   (MIRA 14:1)
        (LIPID METABOLISM)   (LIVER)
        (INTESTINES)   (RADIATION SICKNESS)

DEMIN, N.N.; KORNEYEVA, N.V.; SHATERNIKOV, V.A.

Effect of ionizing radiation on acetylcholine metabolism in Macaca rhesus. Biokhimiia 26 no.3:494-498 My-Je '61.   (MIRA 14:6)
(CHOLINE)   (RADIATION—PHYSIOLOGICAL EFFECT)

SMIRNOV, K.V.; SHATERNIKOV, V.A.

Cholesterol metabolism in radiation sickness of dogs. Radiobiologiia
2 no.2:194-195 '62.   (MIRA 15:4)
            (CHOLESTEROL METABOLISM)   (RADIATION SICKNESS)

SMIRNOV, K.V.; SHATERNIKOV, V.A.

Angiostomy by means of an isolated loop of small intestine.
Biul. eksp. biol. i med. 51 no.6:105-106 Je '61. (MIRA 15:6)

1. Predstavlena deystvitel'nym chlenom AMN SSSR A.V.
Lebedinskim.
(BLOOD VESSELS—SURGERY)
(INTESTINES—TRANSPLANTATION)

SHATERNIKOV, V.A.; SAVCHUK, L.A.

Determination of the content of free fatty acids in blood
plasma by the colorimetric method.   Lab. delo no.10:598-
599 '64.   (MIRA 17:12)

1. Klinika lechebnogo pitaniya (direktor - prof. I.S. Savoshchenko)
Instituta pitaniya (direktor - chlen-korrespondent AMN SSSR prof.
A.A. Pokrovskiy) AMN SSSR, Moskva.

SAPOZHNIKOV, I.I.; TERENTYEV, A.A.; IRODOVKOV, A.M.; TUZHILIN, S.A.

Some problems of the clinical aspect, diagnosis and treatment of chronic pancreatitis. Sov.med. 28 no.7:68-74 JL '65.

(MIRA 18:8)

1. Klinika lechebnogo pitaniya Instituta pitaniya AMN SSSR (direktor - prof. A.A.Pokrovskiy).

ACC NR: AR6034975 *(N)* SOURCE CODE: UR/0272/66/000/008/0059/0060

AUTHOR: Bykhovskiy, Yu. S.; Shaternikov, V. Ye.; Nerubay, M. S.

TITLE: Noncontact measurement of ultrasonic oscillation amplitude in magnetostrictive transducers

SOURCE: Ref. zh. Metrologiya i izmeritel'naya tekhnika, Abs. 8.32.475

REF SOURCE: Nauchn. tr. vuzov Povolzh'ya, vyp. 2, 1965, 117-126

TOPIC TAGS: oscillation, magnetostriction, eddy currents, ultrasonic machining

ABSTRACT: The measurement of ultrasonic oscillation amplitude has become a prerequisite with the introduction of ultrasonics in cutting heat-resistant titanium alloys. For instance, in machining EI-437B high-temperature alloy the tool resistance may increase twice as much or be reduced by a factor of 1.4, depending on the amplitude A to 0.0015 up to 0.005 mm, respectively, all other conditions being equal. Amplitude measurements are necessary in the $0.5-20\mu$ range and frequency range up to 40 kilocycles in the presence of a high-tensity magnetic

Card 1/3   UDC: 534.838:538.65.083.8

ACC NR: AR6034975

field and variable dielectric loss in the lubricant-coolant fluid. Under shop conditions only eddy current transducers are found to meet the requirements. In these transducers, the reverse effect is measured on the primary coil by eddy currents generated in the conductive surface induced by the transducer's electromagnetic field. Another concept of eddy current transducers design features gaps commensurable with the dimension of the coil. The method makes it possible to calculate both the active resistance and insertion impedances. Calculations showed that the inserted active resistance markedly depends on the conductivity of the surface as well as on the gap, while the inductance depends on the gap alone. The maximum sensitivity range of C transducer lies within the range of the ratio of the gap to the coil radius 0 to 0.35, while the inductance sensitivity remains constant in the frequency range of 0.3 to 10 Mc. The relative reactance change for small displacements is just a few percent which determines the selection of the measuring circuit imbalanced bridge, which is used for comparing the transducer impedance against a standard; the measuring instrument responds to the difference of currents passing through it (100 μ amp corresponds to a gap change of 10 μ, the total gap being 1.5 mm). The sensitivity can be increased Q^2 times (Q is the quality factor of the transducer coil) by supplying the voltage of the eddy current transducer through a cable whose capacitance resonates with the coil. An instrument based on this design concept has been built. Basically, it is a high-

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ACC NR: AR6034975

frequency oscillator with rated power of 7 watts and a frequency of 2.5 Mc. It measures quasi-static and dynamic motion. The effect of test-stand vibrations are filtered out by a bandpass filter with a frequency range of 2 to 50 kc. Static calibration is accomplished by a micrometer with an error of $0.5\,\mu$. The device provides readings which are almost linear for gaps between 1.0—1.65 mm. Orig. art. has 4 titles and 12 illustrations.   [KP]

SUB CODE: 20, 14/

Card 3/3

CA

Micromethods for the determination of gutta in Evony-
mus. A. N. Shaternikova and I. V. Berg. *Sovet. Botan.*
15, 161-3(1947); *Chem. Zentr.* 1947, II, 757.—Kuda-
sheva (cf. C .1. 35, 6882) has recommended staining with
an aq. tincture of I. In this case the blue-black colora-
tion of the starch grains interferes. The starch colora-
can be removed before the yellow color of the gutta dis-
appears by extg. for 1 month with alc. A better proce-
dure is heating with 2.5-3% H₂SO₄ for 3-4 min. at 50-
90°, which converts the starch into monosaccharide, so
that only the gutta is stained with the I.   M. G. M.

SHATERNIKOVA, A. N.

23108   Anatomicheskiye issledovaniya stroeniya smoloobrazuyushchey sistemy
        listvennitsy. V sb: issledovaniya po les. Zhoz-vu. L., 1948 (Na
        obl: 1949), C. 175-97. - Bibliogr: 7 nazv.

        SO: LETOPIS' NO. 31, 1949

SHATERNIKOVA, A.N.

Using Crimean pine for establishing highly resiniferous plantations.
Gidroliz.i lesokhim.prom. 10 no.4:18 '57.   (MIRA 10:7)

1. TSentral'nyy nauchno-issledovatel'skiy institut lesnogo
khozyaystva.
                              (Pine)

SHATERNIKOVA, A. N.

Condition of tapped pine stands in the Central Urals. Gidroliz.
i lesokhim. prom. 11 no.5:10-12 '58.   (MIRA 11:9)

1. Leningradskiy nauchno-issledovatel'skiy institut lesnogo
khozyaystva.
        (Central Urals—Turpentine) (Tree tapping)

AKIF'YEVA, K. V.; BELINSKIY, V. A.; BRYUKHANOV, A. V.; VLADIMIROVA,
G. A.; MAKHOVA, Yu. V.; MALINOVSKAYA, N. M.; MYAGKOV, S. M.;
NORMAN, E. A.; SEMEKHIN, Yu. V.; TARASOV, G. K.; TUSHINSKIY,
G. K.; UTYAKOV, P. A.; FAMINTSYN, B. M.; SHATERNIKOVA, I. S.;
SHANSHIYEV, K. M.

Estimation of the danger of avalanches in high mountain areas
designated for development. Inform. sbor. o rab. Geog. fak.
Mosk. gos. un. po. Mezhdunar. geofiz. godu no.8:27-163   '62.
(MIRA 16:1)

(Caucasus---Avalanches)

RUMYANTSEV, N.V.; SHATERNIKOVA, T.M.

Contemporary data on leukemia in cattle. Veterinariia 40
no.4:20-26 Ap '63.

(MIRA 17:1)

SHATET, T., BUDAGOV, YU. A., DZHELEPOV, V. P., DZHAKOV, N. I., IVANOV, N. I.,
LEPTLOV, V. I., MOSKALEV, V. I., FLYAGIN, V. B.,

"The One-Meter Propane Bubble Chamber in Magnetic Field"

paper presented at the Intl Conference on High Energy Physics, Rochester, N. Y.
and/or Berkly California, 25 Aug - 16 Sep 1960.

YEROFEYEV, B.N.; SHATALOV, Ye.T.

For an indissoluble union of geological surveying and prospecting
for mineral resources. Sov. geol. no.53:3-21 '56.   (MLRA 10:4)
(Prospecting)   (Geological surveys)

SHATIK, V.N.

Variability in the yeastlike fungi of the genus Candida under the
influence of mycerin and veliutinin. Eksp. i klin. issl. po antibiot.
2:211-216 '60.   (MIRA 15:5)
(CANDIDA)   (ANTIBIOTICS)

SHATIK, V.N.

Quantitative determination of the activity of antibiotic 26/1 by the agar-diffusion method. Antibiotiki 6 no.12:1123-1127 D '61.
(MIRA 15:2)

1. Leningradskiy nauchno-issledovatel'skiy institut antibiotikov.
(ANTIBIOTICS)

SAMSONOV, G.V.; VEDENEYEVA, V.V.; SHATIK, V.V.; VIKHOREVA, T.A.

Study of the conditions for the reversibility of the sorption of penicillin sorbed in the presence of sulfates and phosphates on the nonselective sorbing EDE-10 anion exchanger. Trudy Len.khim.-farm.inst. no.15:75-80 '62.   (MIRA 15:11)
(PENICILLIN)   (ION EXCHANGE)   (SORPTION)

Effect of the climatic factors of central Yakutia on the course of hypertension and the occurrence of myocardial infarct. Sov. med. 27 no.12:111-114 O '64.   (MIRA 18:11)

1. Yakutskaya gorodskaya bol'nitsa imeni Ordzhonikidze (glavnyy vrach N.O. Migalkin).

SHATIL, A.A.

3563.   CONSUMPTION OF PULVERIZED COAL IN A CYCLONE COMBUSTION CHAMBER WITH AIR COOLING AND OVERHEAD GAS OUTLET.   Katsnelson, B.D. and Shatil, A.A. (Energomoshinostroenie (Pwr Mach., Leningrad), Aug. 1956, 5-10).   Test results on an experimental vertical cyclone combustion chamber with overhead gas outlet provide data on the operation of the chamber with air cooling of the flue walls which are of interest in cases where this arrangement is employed in gas turbines using pulverized coal.   Mechanical undercombustion was 2.2-7.5%.   Fuel fineness, corresponding to lowest value of undercombustion, lay within the range $R_{88} = 20$-35%.   Slag removal coefficient was 65-70%.

C.E.A.

MATIL', A.A.; NEKHENDZI, Ye.Yu.

Wire strain gauges used in automatic recording of tension drops.
Izm. tekh. no.3:45-47 My-Je '57.   (MIRA 10:8)
                    (Strain gauges)

..., S. ., kandidat tekhnicheskikh nauk, SHATIL', A.A., inzhener.

eat exchange in an air-cooled cyclone combustion chamber with
as exhaust through the top. Teploenergetika 4 no.9:73-75 S '57.
(MIRA 10:8)

Tsentral'nyy kotloturbinnyy institut.
(Combustion) (Furnaces)

AUTHOR: Shatil', A.A., Engineer   SOV/96-58-5-20/27

TITLE: On the Design of a Throttle Flow-meter for Dust
          (O Raschete drossel'nogo pyleraskhodomera)

PERIODICAL: Teploenergetika, 1958, Nr 5, pp 77 - 80 (USSR).

ABSTRACT: The throttle principle of measuring dust flows has
         been tried experimentally in the USSR and abroad. There is
         need for a design procedure for devices of this kind. The
         basic equations are formulated and a formula is given for the
         factor that relates the rate of flow to the pressure change
         in the throttling device. Results of the calculation of the
         velocity distribution and additional pressure drops caused by
         a single fraction of dust consisting of spheres of one size
         only are shown graphically in Figure 2.
         If the dust particles of assorted sizes are accelerated
         independently of one another, the total loss of head in the
         constriction will not be the same as that occurring with
         uniform particles. However, experimental data show that in
         practice the motion of an assorted dust in gas cannot be con-
         sidered as independent motion of individual particles. In
         fact, the particles interact so that, within certain limits of
         fineness of milling, the aerodynamic properties of dust with
Card 1/2 different sizes of particles are the same. Hence, calculation

SOV/96-58-5-20/27

On the Design of a Throttle Flow-meter for Dust

of the rate of flow through throttling equipment is con-
siderably simplified. This is illustrated graphically in
Figure 3, which shows the calculated curve for spherical
particles of 20 µ dia. and for an experimental, assorted
dust. It will be seen that in the constriction, which is
the part of practical importance, the curves practically
coincide. Simpler expressions can, therefore, be given
for the factor in the formula.
Little experimental data has hitherto been published on
throttle-type flow-meters. The table gives values of the
coefficient for the seven throttling devices illustrated in
Figure 4. The first four were tested in the TsKTI (Central
Boiler Turbine Institute), the fifth in the MEI (Moscow Power
Institute) and the remaining two by Farbar in the USA. The
agreement between the calculated and test values of the
coefficient is satisfactory. There are 5 figures, 1 table and
7 references, 5 of which are Soviet, 1 German and 1 English.

Card 2/2   1. Flowmeters--Design   2. Flowmeters--Test results   3. Particles
           (Airborne)--Velocity

SHATIL', A.A., inzh.; KALISHEVSKIY, L.L., inzh.

Using the Ventury tube in measuring the consumption of pulverized
coal. [Trudy] MVTU no.94:78-85 '58.   (MIRA 12:3)
                (Coal, Pulverized--Measurement)

SHATIL', A. A., Candidate Tech Sci (diss) -- "Investigation of the throttle

method of measuring dust consumption in pneumatic transport". Leningrad, 1959.

11 pp (Min Higher Educ USSR, Leningrad Polytech Inst im M. I. Kalinin), 150

copies (KL, No 24, 1959, 143)

SOV/96-59-7-22/26

AUTHOR: Shatil', A.A., Engineer

TITLE: Letter to the Editor (Pis'mo v redaktsiyu)

PERIODICAL: Teploenergetika, 1959, Nr 7, pp 92-94, (USSR)

ABSTRACT: This is a discussion of the loss of head when a flow of
            dusty gas passes a local resistance in a pipe. The loss
            of pressure with a dusty flow as compared with a clean
            flow is given by equation (1). In this equation the con-
            centration of dust is allowed for by a factor k numeric-
            ally equal to 0.8. An article by Tsygankov in Teploener-
            getika Nr 3, 1958 proposed a method of determining the
            flow of dusty air in which this constant was used. His
            method of successive approximation is valid, but the graph
            that was given in the article to illustrate the good
            agreement between the theoretical and experimental curves
            for pure air is not; the same agreement can be obtained
            for any value of the coefficient k. American authors and
            the present author have shown that a sharp diaphragm is
            not sensitive to the presence of dust in the flow. Figure
            1 shows graphs of static pressure-drops across a sharp-
Card 1/2   edged throttling device with various concentrations of

SOV/96-59-7-22/26

Letter to the Editor

gas in the flow. Figure 2 plots the coefficient k calculated from the results of Figure 1 as a function of the position of the reference holes in the throttling device with a sharp-edged diaphragm. It will be seen that the value of k does not exceed 0.25. An explanation is offered for these findings. It is concluded that further tests are required to determine the value of the factor k for sharp diaphragms.
There are 3 figures and 6 references, 5 of which are Soviet and 1 English.

Card 2/2

SOV/96-59-9-7/22

AUTHORS: Katsnel'son, B.D. (Candidate of Technical Sciences) and
           Shatil', A.A. (Engineer)

TITLE: An Investigation of an Experimental, Horizontal, Cyclone
           Combustion Chamber with Air Cooling

PERIODICAL: Teploenergetika, 1959, Nr 9, pp 39-46 (USSR)

ABSTRACT: Cyclone-type combustion chambers with liquid slag removal
           appear the most promising for burning solid fuel for gas
           turbines working on an open cycle.   The Central Boiler
           Turbine Institute has studied vertical cyclone type
           combustion chambers burning coal dust with a view to their
           use on open-cycle gas turbines. An object of the work was
           to determine the possibility of using a horizontal cyclone
           combustion chamber with an open-cycle gas turbine and to
           obtain design and operating data. The combustion chamber
           was installed on a test rig that is illustrated diagram-
           matically in Fig 1. The diameter of the combustion
           chamber was 600 mm, the length of the cylindrical part
           850 mm and the diameter of the outlet throat 240 mm.; a
           number of other constructional details are given.   The
           tertiary air used to cool the combustion chamber walls is
           afterwards mixed with the exhaust gases and reduces their
Card 1/7   temperature to 700-750 °C in the throat of the chamber.

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An Investigation of an Experimental, Horizontal, Cyclone
Combustion Chamber with Air Cooling

Hence, the gases pass to an air heater in which the
secondary air is heated to a temperature of 350-400 °C.
There is no ash arrester on the test rig and so a steel
screen was installed to trap enough ash to prevent
excessive damage to the air heater. Liquid slag retained
in the combustion chamber drains off and falls into water
from which it is periodically removed. The slag tap hole
is heated by some gas from the combustion chamber. To
ensure uniformity of delivery the coal was supplied
through a worm conveyor. Coal dust delivered at the rate
of 150-250 kg/hr is taken up by the primary air and may be
delivered either through a burner on the central axis of
the combustion chamber or through one of several slits
round the end. Previous work has usually shown that
axial delivery of coal dust did not give good results,
tangential delivery being necessary to obtain satisfactory
combustion and ash removal in horizontal cyclone
combustion chambers. The tests were made with Donets
gas coal, the characteristics of which are given. Data
on the viscosity of the ash of two grades of coal used as

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An Investigation of an Experimental, Horizontal, Cyclone Combustion
Chamber with Air Cooling

function of temperature are noted in Table 1.   The
principal test results are given in Table 2; all of them
relate to steady operating conditions after adjustments
had been made.   However, the table does include data on
some of the preliminary tests to determine how best to
deliver the fuel to the chamber.   Delivery through
certain slits did not give the best combustion but it was
particularly stable.   The most satisfactory results were
obtained with delivery through two of the slits; one
arrangement of slits gave stable but very incomplete
combustion.   Axial delivery of the fuel was not satis-
factory.   The last test was somewhat special, the fuel
being Vorkuta coal ground to 69% residue on 75 mesh
sieves.   The main characteristics of this coal are given.
The results were much better than when burning finely
milled coal, and the ash removal factor was somewhat
better than 90%.   There is, therefore, some reason to
suppose that ash removal will be appreciably improved by
using relatively coarse milling.   Although the chamber
was started up many times and ran at very high tempera-
tures, it was not damaged.   During the tests the wall

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An Investigation of an Experimental, Horizontal, Cyclone Combustion Chamber with Air Cooling

temperatures usually did not exceed 700 °C, though sometimes they reached 750 °C. During the tests the fuel consumption ranged from 144 to 258 kg/hr, the lower value representing the minimum rate for stable combustion and the upper being limited by the draught facilities available. Mechanical under-combustion, that is, fuel actually left unburned, ranged from 1.17 to 10.7%, and was greater than 6% in about half the tests. This figure is high because the chamber is small and the rating relatively low. Increasing the coarseness of milling reduces the mechanical under-combustion, as will be seen from the graph plotted in Fig 2. Differences between this effect in horizontal and vertical combustion chambers are discussed. The amount of unburned fuel emitted with the exhaust remained approximately constant, most of the variation being in the amount contained in the slag. The graph plotted in Fig 3 shows the particle size composition of the coal dust and of the ash blown out through the exhaust in a particular test. It will be seen that particle sizes above 20 microns (which are the most

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SOV/96-59-9-7/22

An Investigation of an Experimental, Horizontal, Cyclone Combustion
Chamber with Air Cooling

dangerous for the gas turbine) constitute about 85% of the
initial fuel but only 15% in the ash.   In the tests with
coal dust the slag removal factor ranged from 69 to 90%,
and in the test with coarse milling it was greater than
90%.   The graph of slag removal factor as a function of
fineness of milling, given in Fig 4, shows that very fine
milling is unfavourable.   The same factor is plotted
against the thermal loading of the combustion chamber in
Fig 5, and shows that slag removal tends to be less
satisfactory at low combustion rates.   In the tests 12
samples of slag and ash were taken every hour.   The slag
flowed continuously for the eight hours of the test.   The
results are plotted in Fig 6 from which it will be seen
that the slag removal factor in this test was about 80%.
The air resistance of the chamber increased during the
test because of the unsatisfactory operation of the outlet
throat, which needs modification.   The excess air factor
in the combustion chamber ranged from 1.06 to 1.42.   It
will be seen from the graph plotted in Fig 7 that the
least mechanical under-combustion corresponded to an
excess air factor of 1.15 to 1.35.   In some tests gas

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       analyses were made across the diameter and along the
length of the combustion chamber and the results are given
in Fig 8. These tests confirmed the importance of the
mixing effect of the outlet throat constriction in
ensuring that all the gas is fully oxidised. Graphs of
the temperature distribution across two sections of the
combustion chamber are shown in Fig 9, at distances of
150 mm and 450 mm from the top of the chamber. It will be
seen that the flame temperature differs little across the
chamber and is of the order of 1500-1600 °C.
Circumferential and axial gas speeds across three sections
in the chamber are plotted in Fig 10. Graphs of the
resistance of the secondary air duct as a function of the
aperture of the slits are plotted in Fig 11. Data on the
resistance of the secondary air duct including the
resistance of the grid and mixing chamber are given in
Table 2, which also includes air speeds in the slits.
The above results show that a horizontal pulverized-fuel
Card 6/7 cyclone combustion chamber with air cooling and liquid
slag removal can be used in open-cycle gas turbines.

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An Investigation of an Experimental, Horizontal, Cyclone Combustion
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        The best combustion and slag removal is obtained with
        coarsely-milled fuel. Further investigations may show
        how far the increase in resistance that inevitably
        accompanies coarse milling is economically justified by
        reduction in milling costs and improvement in operating
        characteristics.
Card 7/7 There are 11 figures, 2 tables and 9 references, of which
        8 are Soviet and 1 English).

ASSOCIATION: Tsentral'nyy kotloturbinnyy institut
            (Central Boiler Turbine Institute)

/5

PHASE I BOOK EXPLOITATION   SOV/5519

Kremlevskiy, P. P., Candidate of Technical Sciences, ed.

Teploenergeticheskiye i khimikotekhnologicheskiye pribory i regulyatory
    (Instruments and Regulators in Heat-Power and Chemical Engineering)
    Moscow, Mashgiz, 1961, 207 p.   Errata slip inserted. 8,500 copies
    printed.

Ed. of Publishing House: G. A. Dudusova; Tech. Ed.: L. V. Shchetinina;
    Managing Ed. for Literature on the Design and Operation of Machines,
    Leningrad Department, Mashgiz: F. I. Fetisov, Engineer.

PURPOSE: This book is intended for engineers and technicians who construct,
    design, and operate industrial instruments and regulators.

COVERAGE: The book deals with new investigations in the field of automatic
    checking and regulation of heat-power and chemical industrial processes.
    The following problems are discussed: improvement of two-position
    control operation; effect of mass action and damping on proportional
    control; new proportional plus integral and programming electronic
    regulation systems; complete automation of open-hearth furnaces;
    automation of boilers with variable load capacity; measurement of
    pulsating flow; measurement of dust flow; ultrasonic and magnetic-
    induction flowmeters; pneumatic compensating differential manome-
    ters; aggressive-fluid flowmeters; new magnetic and optical-acous-
    tical gas analyzers; concentration meters; and chlorine and coagulant
    regulators.   The book is the fifth in a series containing reports on the
    investigations carried out by the Section on Heat-Engineering Control
    Instrumentation and Automation of the Leningradskoye otdelenlye
    Nauchno-tekhnicheskogo obshchestva priborostroitel'noy promyshlennosti
    (Leningrad Branch of the Scientific and Technical Society of the Instru-
    ment-Building Industry.) All the articles presented in this book were
    discussed either at sessions of the above section or at the conference on
    measurements of mechanical quantities called by the section, the
    VNIIM (Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii im.
    D.I. Mendeleyeva -- All-Union Scientific Research Institute of
    Metrology imeni D.I. Mendeleyev), and the Leningradskiy dom
    uchenykh im. A.M. Gor'kogo (Leningrad Home for Scientists imeni
    A.M. Gor'kiy). No personalities are mentioned. There are 65 ref-
    erences: 41 Soviet, 20 English, and 4 German. References accompany
    most chapters.

TABLE OF CONTENTS:

Foreword   9

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26.2130

AUTHORS: Polyatskin, M.A., Candidate of Technical Sciences,
             Shatil', A.A., Khaynovskiy, Ya.S., Engineer and
             Babkin, V.N., Engineer

TITLE: Natural gas burners for gas-turbine combustion chambers

PERIODICAL: Energomashinostroyeniye, 1961, No.7, pp.34-36

TEXT: In designing the combustion chamber for a gas turbine type
ГТУ-50-800 (GTU-50-800) burning natural gas, insufficient
information was available about burner design.   Accordingly,
TsKTI and KhTGZ made a joint investigation of burners in an
experimental combustion chamber which was described in an article
by M.Polyatskin and Z.M.Svyatskiy in Teploenergetika, 1959, No.2.
The main object was not so much to find the best burner for
burning natural gas as to study the main features of certain very
different types of burner.   Accordingly, besides studying complete-
ness of combustion, an attempt was made to study the influence of
the burner design on flame structure.   As the process of mixing
gas with air governs burner operation, three types of burner,
illustrated in Fig.2, were tested.   The first of these (Fig.2a)
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Natural gas burners ...

uses a conical swirler, which allows preliminary mixing of gas and
air in the actual burner. The second (Fig.2b) has a flat swirler
with hollow blades, gas being delivered through holes in the blade;
it allows only partial mixing of fuel and air in the burner. In
the third type (Fig.2B) the gas and air are mixed in the actual
combustion chamber. A number of variants on these basic designs
were tested. The usual kinds of measurements were made and, in
addition, gas samples were taken for analysis at various places in
the flame tube and measurements were made of the gas temperature.
Curves of completeness of combustion and of temperature
distribution were plotted and the influence of various minor
design modifications on the performance were studied with such
curves. With natural gas, combustion was most complete with the
burner with conical swirler but it could operate only over a narrow
range of excess-air factor. The burner with flat swirler with the
gas delivered through hollow blades was more stable, particularly
when there was no preliminary mixing of gas and air. Studies of
temperature distribution and gas analysis distribution were made
with various design modifications and, in general, the following
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Natural gas burners ...

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conclusions are drawn.   When burning liquid fuel, it is desirable
to have a fairly strong axial return flow of hot combustion products
to heat up the liquid fuel and to stabilize combustion.   However,
when burning natural gas, the axial return of a large quantity of
heat to the root of the flame usually gives inadequate oxygen and
can lead to soot formation.   With natural gas, quite a small
return flow, required to ensure stable ignition of the mixture, is
sufficient.   None of the burners tested was good in respect of
completeness of combustion; the main reason for this was that
methane was carried away along the walls of the flame tube where
the temperature is lowest with high excess-air factor.   If
preliminary mixing of the fuel and air is reduced, the range of
stable operation is widened.   It is expected that the experimental
data on flame structure will be useful in designing the
distribution of air and fuel over the chamber section.   There
are 5 figures and 4 Soviet-bloc references.

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Natural gas burners ...

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a)

б)   в)
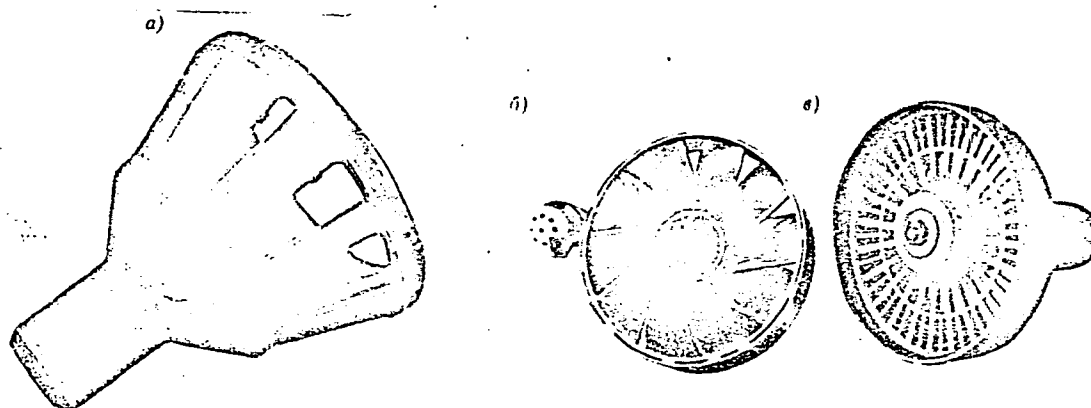
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Fig.2.

SHATIL', A.A.

Measuring the flow of a two-phase current by means of a
Ventury tube.   Izm.tekh. no.9:46- 48 S '61. (MIRA 14:8)
(Flowmeters)

POLYAKHIN, V.A., kand.tekhn.nauk; SHATIL', A.A., kand.tekhn.nauk;
SHCHOV, A.V., inzh.

Use of the GIAP-L chromatographic gas analyzer for studying the
combustion chambers of gas turbine systems. Energomashinostroenie
7 no.4:16-22 Ap '61.   (MIRA 14:7)
            (Gas turbines)   (Gas—Analysis)

POLYATSKIN, M.A., kand.tekhn.nauk; SHATIL', A.A.; KHAYNOVSKIY, Ya.S.,   inzh.
     BABKIN, V.M., inzh.

Torch tips for burning natural gas in the combustion chambers of
gas turbine systems. Energomashinostroenie 7 no.7:34-36 Jl
'61.   (MIRA 14:8)
                    (Gas turbines)

POLYATSKIN, M.A., kand.tekhn.nauk; SHATIL', A.A., kand.tekhn.nauk;
KHAYMOVSKIY, Ya.S., inzh.; BABKIN, V.N., inzh.

Certain data on heat exchange in the combustion chamber of a gas
turbine system operating on natural gas. Teploenergetika 8 no.7:
68-72 Jl '61.   (MIRA 14:9)

1. TSentral'nyy nauchno-issledovatel'skiy kotloturbinnyy in-
stitut imeni I.I. Polzunova i Khar'kovskiy turbogeneratornyy
zavod.
              (Gas turbines)   (Heat--Transmission)

POLYATSKIN, M.A., kand.tekhn.nauk; SHATIL', A.A., kand.tekhn.nauk;
    KHAYNOVSKOY, Ya.S., inzh.; SEKUNDA, A.T., inzh.

Testing the experimental GTU-50-800 combustion chamber fired with
natural gas. Teploenergetika 9 no.1:20-24 Ja '62.
                                          (MIRA 14:12)
1. TSentral'nyy kotloturbinnyy institut im. I.I.Polzunova i
Khar'kovskiy turbinnyy zavod imeni Kirova.
                (Gas turbines--Testing)
                (Gas, Natural)

SHATIL', A.A.,kand.tekhn.nauk

Simplified method of heat caluclation in the multiple-stage
burning of natural gas and liquid fuel. Teploenergetika 9 no.11:
91-93 N '62.   (MIRA 15:10)
1. Tsentral'nyy kotloturbinnyy institut.
    (Fuel—Combustion)   (Boilers—Design and const. .ction)

KREMLEVSKIY, P.P.; SHATIL, A.A., kand. tekhn.nauk, retsenzent;
        KRYMSKIY I.L., inzh., retsenzent; MITARCHUK, G.A., red.
        izd-va, SIMCHOVSKIY, N.Z., red.izd-va; SHCHETININA, L.V.,
        tekhn. red.

        [Flowmeters] Raskhodomery. Izd.2., perer. i dop. Moskva,
        Mashgiz, 1963. 655 p.   (MIRA 16:11)
                        (Flowmeters)

S/096/63/000/005/002/011
E194/E455

AUTHORS: Shatil', A.A., Candidate of Technical Sciences,
                Khaynovskiy, Ya.S., Engineer

TITLE: An investigation of heat exchange in an experimental
                combustion chamber of a gas turbine type ГТУ-50-800
                (GTU-50-800) burning natural gas

PERIODICAL: Teploenergetika, no.5, 1963, 30-35

TEXT: A study was made of radiative and convective heat-transfer
in a large combustion chamber installed on a test bed in the
Khar'kovskiy turbinnyy zavod (Khar'kov Turbine Works).   Hitherto
little work has been done in this field for gas turbines running on
natural gas fuel.   Radiative and convective heat-transfer could
not be separated by the usual procedure of having calorimeters with
different degrees of blackness because of heavy contamination of
the calorimeter surfaces by dust and oil in the air delivered by
the compressors.   Eight water-cooled calorimeters with blackened
surfaces were installed in pairs in four different sections of the
combustion chamber.   The calorimeters were calibrated by hot-air
blowing tests.   Corrections that must be made when combustion is
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An investigation of heat exchange ...

present and the calorimeter surface is at a different temperature
from that of the surrounding casing are explained.   A special
eight-position thermocouple rig measured the temperature
distribution near the flame tube.   Hemispherical radiation radio-
meters were also used to determine the incident radiant-heat flows
in the first, third and fifth casing shells.   This device is water-
cooled, and ventilated with dry air.   The heat-absorbing sphere,
4 mm in diameter, is located at the focus of an ellipsoid with
diameters of 100 and 60 mm.   The instrument is calibrated in a
furnace and its sensitivity is 1200 kcal/m^2 hour per degree of
reading.   The temperature distribution in the combustion chamber
studied is trapezoidal.   There is a sharp fall in temperature near
the walls.   Near the core of the flame the temperature remains
approximately constant over a considerable proportion of the flame
length.   In this large flame tube the flow temperature near the
walls was less than that of the walls throughout their length.
It follows that the flame tube is cooled from within as well as
from without.   The following expression gives the approximate
criterial relationship for convective heat-transfer between the

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An investigation of heat exchange ...   S/096/63/000/005/002/011
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flame tube and the flow on the inner side

$$Nu_1 = 0.011Re_1^{0.8} \qquad (6)$$

In some of the tests the radiant and convective components of
heat transfer were separated by means of calorimeters and hemi-
spherical radiation radiometers.   Calculated and experimental
results were in agreement within 20%, which is considered
satisfactory.   Graphs are plotted of the relationship between the
effective blackness of the flame and the excess-air factor,
of the spectral 'blackness' temperature of the flame in the wave
length range of 0.8 to 2.6 μ, which displays the typical wavy
spectrum of triatomic gases, and curves of the spectral intensity
of radiation of black, grey and actual flame for a flame temperature
of 1823°K.   The data obtained can be used to draw up a heat-flow
balance on the wall of the flame tube with accuracy sufficient for
practical purposes;   similar calculations can be made for other
combustion chambers of similar design burning natural gas.   In
making these calculations it is recommended that the coefficient
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An investigation of heat exchange ...

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of thermal effectiveness ψ should be calculated by the following expression

$$\psi = \left[1 - \left(\frac{T_{ct}}{T_F}\right)^4 \frac{1}{\varepsilon_T} \right] \varepsilon_{ct} \qquad (9)$$

and the degree of blackness of the furnace radiation ε_T by

$$\varepsilon_T = \frac{\varepsilon_F}{\varepsilon_F + (1 - \varepsilon_F)\psi} \qquad (12)$$

where ε_{ct} and ε_T are the degrees of blackness of the wall and the furnace radiation respectively, ε_F - the effective degree of blackness of the flame, T_{ct} - wall temperature and T_F - flame temperature. The heat-transfer coefficients from the outer and inner surfaces of the casings should be calculated in the following expressions

$$Nu_2 = 0.043 Re_2^{0.8}; \quad Nu_1 = 0.011 Re_1^{0.8}$$

ASSOCIATION: TsKTI - KhTGZ   There are 7 figures.
Card 4/4

SHATIL', A.A., kand. tekhn. nauk

Effect of heat supply on the hydraulic characteristics of the
combustion chamber of a gas turbine system. Teploenergetika
10 no.9:15-19 S '63.   (MIRA 16:10)

1. TSentral'nyy kotloturbinnyy institut.
          (Gas turbines)

S/0096/64/000/005/0048/0053

ACCESSION NR: AP4034654

AUTHORS: Shatil', A. A. (Candidate of technical sciences); Murashko, V. D. (Engineer)

TITLE: Application of characteristic method in gas turbine combustion chamber investigations

SOURCE: Teploenergetika, no. 5, 1964, 48-53

TOPIC TAGS: combustion process, combustion chamber, pure diffusion, heat balance, adiabatic limit, heat capacity, excess coefficient, diffusion time

ABSTRACT: Several characteristic combustion processes were investigated and applied to combustion chamber studies in GTU gas turbines. Combustion types considered were: pure kinetic, pure diffusion, and an intermediate method described by L. A. Vulis (Teplovoy rezhim goreniya. Gosenergoizdat, 1954). A small and a large combustion chamber were studied with both plane and conical type constructions. The heat balance equation for the combustion chamber becomes

$$\varphi \eta Q_p'' = (1 + L_e a) c_{pm} (T - T_e),$$

where ϕ - coefficient characterizing the adiabatic limits of the chamber

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ACCESSION NR: AP4034654

$(0.85 \leq \phi \leq 0.99)$, Q_p^H - fuel heat capacity, L_o - quantity of air for combustion, α - air excess coefficient, η - degree of combustion (depending on type of combustion). The above equation is written in the form $\eta = \frac{1}{\tau^0}(\theta - \theta_o)$,

where $\theta = \frac{Q_p^H R}{L_o E (1/L_o + \alpha) c_{pm}}$. Plots of η versus θ (θ - dimensionless temperature) curves from experimental combustion data can be fitted fairly well with an empirical expression

$$\eta = \frac{1}{1 + \frac{1}{\tau_{pd}} + \frac{e^{m/\theta}}{k\theta^{n}\cdot\theta}},$$

where τ_{pd} - ratio of stay-to-diffusion time. Comparison of the small chamber to the large one (2.5 times bigger) indicates that the kinetic coefficients m and k_o depend only on the type of construction (plane or conical) and are insensitive to the scale and similarity parameters of these chambers. On the other hand, the dimensionless time τ_{pd} depends strongly on the construction type and is independent of L/w (combustion-stay time). Orig. art. has: 11 formulas, 7 figures, and 2 tables.

ASSOCIATION: none

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ACCESSION NR: AP4034654

SUBMITTED: 00

SUB CODE: PR, TD   NO REF SOV: 012

ENCL: 00

OTHER: 001

Card 3/3

SHATIL', A.A., kand.tekhn.nauk; KHAYNOVSKIY, Ya.S., inzh.; MURASHKO,
V.D., inzh.

Burning of natural gas under pressure in the combustion chamber
of a gas turbine system. Teploenergetika 11 no. 1:63-67 Ja '64.
(MIRA 17:5)

1. Tsentral'nyy kotloturbinnyy institut i Khar'kovskiy
turbinnyy zavod im. S.M.Kirova.

L 1987-66   EPA/EWT(m)/EPF(c)/EWP(f)/EPF(n)-2/T-2/EWA(c)/ETC(m)   WM/WE
ACCESSION NR: AP5018373

UR/0114/65/000/007/0029/0032
621.438.001.5

AUTHOR: Polyatskin, M. A. (Candidate of technical sciences); Tass, O. A. (Engineer); Shatil', A. A. (Candidate of technical sciences)

TITLE: Results of an investigation of aerodynamics and combustion in a gas-turbine combustor

SOURCE: Energomashinostroyeniye, no. 7, 1965, 29-32

TOPIC TAGS: gas turbine, combustion chamber

ABSTRACT: Aerodynamics and combustion were investigated in a conventional gas-turbine combustor supplied with a city gas having a calorific value of 30000 kj/nm³. A blade-register burner of OD = 226 mm and 4-mm gas ports in 8 hollow blades was used. Two designs of the flame tube ID = 400 mm were tested: (1) Three 180-mm-long shells, one of them welded to a 90°-aperture cone, and the others having 4-mm gaps between them; (2) Two shells with a

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L 1987-66

ACCESSION NR: AP5018373

17-mm gap between them and a blade swirler inside. Aerodynamic measurements on the flame tubes yielded these results: (1) Both designs have characteristic axial-velocity fields with maximum lying at 0.1—0.2 radius from the wall and a near-axis zone of back flow; (2) A higher G_1/G ratio results in a smaller back-flow zone and in higher velocities at the periphery and at the center of the tube; (3) The combustion process cuts the back-flow zone and the quantity of gas therein by several times as compared to the isothermic blowdowns. Data on the gas burn-up depending on various conditions is also reported. Orig. art. has: 6 figures and 5 formulas.

ASSOCIATION: none

SUBMITTED: 00   ENCL: 00   SUB CODE: PR

NO REF SOV: 003   OTHER: 000

Card 2/2

POLYATSKIN, M.A.; SHATIL', A.A.; AFROSIMOVA, V.N.

Evaluating the completeness of the processes of mixing and combustion
in a boiler furnace burning natural gas. Gaz.prom. 10 no.2:24-27
'65.
(MIRA 18:12)

L 55939-65   EPA/EWT(m)/EPF(c)/EWP(f)/EPF(n)-2/EPR/T/EPA(bb)-2/EWA(c)   Paa-4/Pr-4/
Ps-4/Pt-7   WW/JW/WE
ACCESSION NR: AP5016540   UR/0096/65/000/007/0054/0058
                                             621.438:621.43.056.001.24

AUTHOR: Shatil', A. A. (Candidate of technical sciences); Murashko,
V. D. (Engineer)

TITLE: On the approximate modelling of combustion chambers of gas
turbines for natural gas

SOURCE: Teploenergetika, no. 7, 1965, 54-58

TOPIC TAGS: gas turbine, combustion chamber, combustion chamber
modelling, combustion analysis, combustion, aviation turbine

ABSTRACT: In connection with the increasing use of gas turbines,
the problem of combustion chamber modelling is widely studied by
Soviet and non-Soviet authors. The majority of them attempt to
formulate conditions for approximate modelling and find a set of
parameters which should be similar in the model and full scale cham-
ber. The authors of this article present a new approach to the
modelling of the combustion process based on a diffusional-kinetic
analysis of combustion. An outline of the calculation procedure is
given. Orig. art. has: 9 formulas and 1 figure.   [AC]
Card   1/2

L 55939-65

ACCESSION NR: AP5016540

ASSOCIATION: TsKTI; KhTGZ

SUBMITTED: 00   ENCL: 00   SUB CODE: PR, FP

NO REF SOV: 016   OTHER: 001   ATD PRESS: 4032

Card 2/2

L. 20190-66   EWP(f)/EPF n-2/T-2/ETC(m)-6   WW/JW/WE

ACC NR: AP6004171   (N)   SOURCE CODE: UR/0096/66/000/002/0047/0051

AUTHOR: Polyatskin, M. A. (Candidate of technical sciences); Tass, O. A. (Engineer);
Shatil', A. A. (Candidate of technical sciences)

ORG: Central Boiler and Turbine Institute (Tsentral'nyy Kotloturbinnyy Institut)

TITLE: Investigation of the combined cooling of a gas-turbine combustion chamber

SOURCE: Teploenergetika, no. 2, 1966, 47-51

TOPIC TAGS: combustion chamber, flame tube, gas turbine, heat transfer

ABSTRACT: Combined internal and external cooling of the flame tube of a gas turbine
combustion chamber was investigated experimentally using both a telescopic flame tube
and a flame tube with a single slit, 17 mm wide, with swirl vanes. Measurements were
made of the gas and air flow rates, distribution of the temperature and flow veloci-
ties along the radius, and the pressure drop along the combustion chamber. The ob-
tained results indicate that the major portion of the heat from the flame tube is re-
moved by external cooling, i.e., by the air flow through the annular duct of the com-
bustion chamber. The use of a single slit with swirl vanes increases the heat trans-
fer coefficient and considerably reduces the flame tube wall temperature. It is noted
that the reduction in temperature can also be achieved by using longitudinal or trans-
verse ribs. The obtained relationship for convective heat transfer can be used for

Card 1/2   UDC: 621.438.621.43.056

L 20470-66

ACC NR: AP6004171

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approximate calculations of the flame tube wall temperature in combustion chambers of similar design. Orig. art. has: 6 figures and 2 formulas.   [AS]

SUB CODE: 21/ SUBM DATE: none/ ORIG REF: 009/ ATD PRESS: 4215

Card 2/2

L 22292-66   EPF(z)-2/EWT(d)/EWT(m)/ETC(m)-6/T/EWP(f)   WW/WE

ACC NR: AP6009813   (v)   UR/0096/66/000/004/0043/0048

AUTHOR: Polyatskin, M.A. (Candidate of technical sciences); Shatil', A.A. (Candidate of technical sciences); Khaynovskiy, Ya.S. (Candidate of technical sciences); Murashko, V.D. (Engineer); Miroshnichenko, V.I. (Engineer)

ORG: TsKTI; KhTGZ

TITLE: Mixing and combustion processes in the combustion chamber of a gas turbine installation

ABSTRACT: The article reports the results of aerodynamic investigations of an experimental combustion chamber with three different types of burners. The measurements were made with a three channel cylindrical water cooled probe, at sections located at relative distances L/D from the burner equal to 0.48, 1.1, 1.72, and 2.2 (D is the diameter of the chamber). The fuel was natural gas. Data on the axial mass velocities and the composition of the products of combustion make it possible to establish the distribution of the mass velocities of the fuel being fed over the cross section of the chamber. Calculation of the local values of the mass velocities of the fuel was carried out with the approximate formula:

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L 22292-66

ACC NR: AP6009813

$$B_i = \frac{w_i \rho_i}{L_0 \alpha_i}, \quad \kappa z/\mu^2 \cdot ce\kappa, \qquad (1)$$

where w_1 and ρ_1 are the local velocity and density of the gas; α_1 are the local values of the excess air coefficients; L_0 is the stoichiometric coefficient (for the gas used, $L_0 = 16.4$ kg/kg). The experimental form of the flame in the combustion chamber is illustrated in a series of figures. Other figures show the schematic mixing picture in the combustion chamber. In general, the experimental results indicate that in the combustion the main mechanism is convective transfer which, in turn, is determined by the aerodynamic structure of the flow. Orig. art. has: 5 formulas and 7 figures.

SUB CODE: 21/3/ SUBM DATE: none/ ORIG REF: 013

Card   2/2   net

VOLKOV ... , ... N M., VITER, V.I.; ... R.I... RYABTSEV,
... ... F.F.; CHATILIN, A.I.; ... , L.Ya.

Blowing in a large capacity blast furnace. Metallurg 10
... B ... '6J.   (MIRA 18:4)

SHATILIN, Aleksey Leontyevich, master domennogo tsekha Magnitogorskogo metallurgicheskogo kombinata imeni I.V.Stalina, laureat Stalinskoy premii; RUTKOVSKIY, G., konsul'tant, inzhener.

[The blast furnaces of Magnitogorsk] Na domnakh Magnitki. Moskva, Profizdat, 1953. 45 p.   (MLRA 7:7)
        (Magnitogorsk--Blast furnaces)