IMPROVING THE QUALITY OF MINING EXPLOSIVES

- USSR -

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DATE: 16 May 1960
FOREWORD

This publication was prepared under contract by the UNITED STATES JOINT PUBLICATIONS RESEARCH SERVICE, a federal government organization established to service the translation and research needs of the various government departments.
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Following is a translation of an article by A. A. Vovk, mining engineer, in Ugol' Ukrainy (Ukrainian Coal), No. 12, Kiev, December 1959, page 43.

In September 1959 a regular session of the Permanent Commission of the GosNIIK (Gosudarstvenny Nauchno-technicheskiy Komitet -- State Scientific-Technical Committee) of the Soviet of Ministers, Ukrainian SSR, was held in the MakNII (Makeyevskiy Nauchno-issledovatel'skiy Institut -- Makeyevka Scientific Research Institute) to discuss the introduction of safe and effective explosives and the materials and methods used in blasting. More than 60 representatives from coal mines, trusts, National Economic Councils, and scientific research and planning-designing organizations participated in the session. Reports and papers were read on the problems of developing and introducing more effective and safer explosives and methods for carrying out blasting work in coal industry. Drafts of the plans for scientific research of the MakNII, DonUGI DII, and UkrNIOMShS in the field of drilling and blasting were also examined.

It was noted in the decisions of the Commission that the process of producing explosives and the methods used in blasting have a number of serious shortcomings. The majority of safe explosives (ammonite No 8, PU-2, AP-1, AP-2) are not water-resistant and can deteriorate in storage, which excludes them from further use in coal mines. Thus the development of high-safety and water-resistant explosives with a sharp increase in stability is a most important task.

Introduction of the short-delay method of blasting is limited by the inadequate output of EKDZ electric blasting caps, while the introduction of the MakNII water-spray curtain used in opening preparatory workings is delayed by the lack of polyethylene hose.

The commission noted that supplying the manufacturing plants with water-resistant ammonium nitrate is one of the most important measures which would make it possible to improve the quality of explosives.

The drafts of the plans for scientific research which were examined were directed essentially to the solution of urgent problems in the field of blasting work. Along with this, the Commission recommended that the UkrNIOMShS revise its schedule of projects and include work on the industrial testing of detonators in the Donets and Krivoy Rod basins.
To improve the effectiveness and safety of blasting work in the
coal mines of the Ukrainian SSR, the Permanent Commission of the GVTK
(Gosudarstvenny Nauchno-Tekhnicheskiy Komit -- State Scientific-Technical
Committee) of the Soviet of Ministers of the Ukrainian SSR recommends:

1. Beginning with the second quarter of 1960, the Gorlovka
Nitrogen Fertilizer Plant is to produce water-resistant ammonium
nitrate for plants that produce explosives.

2. Taking into consideration the limited assortment of safety
explosives for the coal-mining industry, the interested organizations
are to develop new safety explosives in accordance with the specifica-

3. The MakNII is to carry out extensive industrial tests of
waterspray curtains and explosives in polyethylene casings filled with
water in coal mines.

The manufacturing plant is to accelerate the production of EKZ
caps with a delay component based on crystallized silicon with delay
periods recommended by the MakNII (35-70-110 milliseconds). The plant
is working jointly with the MakNII to complete the development of EKZ
caps which will be safe in methane explosions, ensuring the production
of experimental lots of such electric blasting caps, and, beginning in
1960, to master their mass production.

4. In the first half of 1960, the Stalinsk and the Lugansk
National Economic Councils are to carry out extensive industrial tests
of new high-safety explosives -- equivalent (E-5) and those in compres-
sion casings (metanit No 4), and also plastic and semiplastic explosives
made of 35% dynamite and VP-type safety pöbedit on exchange salts, in
order to establish the expediency of their mass production. In 1960
they are also to produce experimental lots of a new pöbedit, to be
known as VP-1 pöbedit, made of water-resistant iron-coated ammonium
nitrate with sawdust added.

5. The Gosplan (State Planning Commission) of the Ukrainian SSR
is to examine the problem of supplying the manufacturing plants with
plastic materials for packing safety explosives beginning in 1960.

The Commission adopted a number of recommendations to the Gos-
gortekhnadzor of the Ukrainian SSR and the MakNII regarding the trans-
portation and storage of explosives, quality control tests of mass lots,
permits for using new types of explosives, and others.

In addition, it was acknowledged as expedient to manufacture (in
the first half of 1960) experimental lots of thyatron pulse devices
designed by the MakNII for determining the ignition pulses of electric
blasting caps.