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INCORRECT CALCULATIONS - ERRONEOUS CONCLUSIONS

Ya. I. Levchenko
Engineer, Tula Coal Combine

(Review /in Russian/ of S. D. Sonin's "Control of Coal Exploitation Losses in the Mines of the Moscow Coal Field," Coal Technology Publishing House, Ministry of the Coal Industry of Western Regions, 1947, 58 pp, 2,000 copies.)

Professor S. D. Sonin, in his book on the present-day problems of the Moscow Coal Field, discusses the important problem of cutting down production losses in working wide strata by changing to a layer system. However, it is necessary to point out a great many inaccuracies in terminology and, even more important, erroneous conclusions drawn by Sonin, which considerably reduce the book's value.

An example of this is the decrease in reserves as disclosed by the final survey, due to sections having seam widths less than those of the working seams as well as sections without coal. This is incorrectly classified by Professor Sonin as a loss brought about by deterioration in geological and hydrogeological conditions.

If, as a result of the survey of reserves, established by VNIZ, sections were disclosed with seam widths narrower than the established standard (for the Moscow field, under one meter), they should be listed as conditional, and not classed as losses as is done by Sonin. He also deals with sections where the bed has completely tapered off. How can nonexistent reserves be "lost"? Also, reserves which contain more ash than the established standard (for the Moscow Coal Field, over 45 percent) should not be classified as losses.

The appearance of unconditional reserves, narrow veins, and sections without coal in established reserves is the result of inadequacies in existing prospecting methods. Therefore, the reserves should be considered decreased, not due to losses, but due to the incorrect estimates of reserves in the original evaluation.

An altogether different state exists concerning conditional reserves of coal, both as to vein width and quality which, due to difficult hydrogeological conditions (large inflow of water, geological disturbances, quicksand, etc.) are not worked for technical and economical considerations. Then the residual coal should be treated as losses due to difficult hydrogeological and geological conditions. The decision to abandon such sections is ordinarily made by trust or combine committees and ratified by mining technology inspection boards.

Professor Sonin states that decrease of losses in 1942 by both Moscow combines was accomplished by reducing losses in development work by reduction of passages in the mines. This is not entirely true. Since the percentage of loss in development work is estimated by the reserves in the area undergoing developments, it does not depend on the extent of the reserves, but on the cross section (height) and location which they occupy relative to the strata.

Professor Sonin points out that in the percentage relationship to corresponding reserves, the losses in development workings are 20-25 percent lower than in face working and in production losses as a whole. Further, referring to the percentage output from development workings (17-25 percent), the author incorrectly recommends the reduction of losses in development workings by decreasing their extent.

A very simple example will clarify this. Let us suppose that we have two workings of different lengths, 100 and 50 meters, whose cross sections are alike (2.5 meters along the top, and 3.1 meters along the bottom; height, 2.3 meters). In both workings a 0.3-meter-thick layer of coal remains in the roof. Then the losses from the first working (100 meters) will be

$$\frac{0.3 \times 2.5 \times 100 \times 1.25}{\left(100 \times \frac{2.5 + 3.1}{2}\right) 1.25 + 0.3 \times 2.5 \times 100 \times 1.25} = 21.1 \text{ percent,}$$

and for the second working, 50 meters

$$\frac{0.3 \times 2.5 \times 50 \times 1.25}{\left(50 \times \frac{2.5 + 3.1}{2}\right) 1.25 + 0.3 \times 2.5 \times 50 \times 1.25} = 21.1 \text{ percent.}$$

As shown by these examples, the percentage loss in development workings does not depend on the extent of development. It is another matter when unnecessary development passages (drifts, crosscuts, connections, etc.) bring about a considerable increase in losses in facings and turns.

However, Professor Sonin does not treat these problems thoroughly enough.

According to the Tul'ugol' (Tula Coal) Combine, losses in development work relative to the over-all depletion in reserves were 2.7 percent for 1944, 1.8 percent for 1945, 1.9 percent for 1946, and 2.16 percent for 1947. Considering that these losses comprise only 1.8-2.2 percent of the depletion in reserves (or one-eighth to one-ninth of the general mining losses) and also the circumstance that, in drift passages and other development work, we are chiefly dealing with cross

sections and sometimes with profiles, the problem of decreasing losses in development work is hardly worth considering. The main stress should be laid on losses in facings and turns.

It is unknown from what sources the author obtained the incorrect data. They do not correspond to the figures of the Tulaugol' Combine, nor do they agree with the data given in the publication completed in 1944 by the mine and mine survey sections of the Technical Department of the Narkomugla (People's Commissariat for Coal) under the supervision of Comrade G. A. Lomov. According to these sources, production losses were: 1941 - 14.1 percent, 1942 - 11.9 percent, 1943 - 15.4 percent, and 1944 - 15.7 percent; then the later figures corresponded with Professor Sonin's data: 1945 - 15.9 percent, 1946 - 13.3 percent, and 1947 - 21.3 percent.

Professor Sonin should have given a more detailed analysis of the losses on turns since in the Moscow basin there are many mines where the work is done in turns, not only in narrow-vein beds, but also in wide-vein beds (pits no 72, 73 of the Kalininugol' Trust, all shallow pits of the Tovarkovugol' Trust). Here the losses in turns are very often smaller than in face working.

Professor Sonin purports to show by a figure that production losses along the width of the bed in development work and in face working begin with a width of 1.8-1.9 meters. Actually this is not at all clear from his figure. On page 10, after Table 1, in which data is given on the use of reserves for 1 January 1944 for the Moskvougol' and Tulaugol' Combines and the Moscow basin as a whole, Sonin concludes, "Thus, regarding losses in reserves, the Moscow basin ranks third after the Kuzbas and Karaganda regions, outstripping all the other basins of the USSR." This sentence is incomprehensible to the reader. Not having any knowledge of the losses of the Kuzbas and Karaganda regions, the reader cannot understand whether Sonin takes the largest or smallest percentage loss as his starting point.

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