A coordinating conference on "Thermal and Ice Regime of Open Rivers and of Reservoirs and their Regulation" was held on May 22-25, 1967 in the Kazakhstan Research Power Institute (KazNIIÉ) at Alma Ata. The conference was called by the Vedeneev All-Union Research Institute of Hydrotechnics (VNIIG), the KazNIIÉ, and the hydro-power section of the Scientific Council "Power and Electrification" of the State Committee of the Council of Ministers USSR on Science and Technology.

Over 90 people representing 42 organizations took part in the conference. The organizations included research, planning, and construction agencies, ministries, power systems and institutions of higher learning. The work of the conference was done in four sections; the ice thermal regime of open rivers, the ice thermal regime of reservoirs, construction and operation of hydraulic structures under ice conditions, and the regulation of the ice thermal regime.

The sections were directed by Prof. V. S. Antonov and I. S. Peschanskii Doctors of geographical sciences, by K. N. Korzhavin, Doctor of technical sciences and by Academician V. P. Zakharov, Academy of Sciences of the KazSSR.

The conference was opened by the chairman of the Organization Committee, Doctor of Technical Sciences, Prof. B. V. Proskuryakov, who made the introductory remarks. Information on the implementation of the resolutions of the 1965 coordinating conference was presented by S. M. Aleinikov, Scientific Secretary of the Interdepartmental Coordinating Commission on the Ice Thermal Regime of Water Bodies and Channels of the Vedeneev VNIIG. To work out the resolutions a commission was elected consisting of: Ya. L. Gotlib (S. Ya. Zhuk Gidroproekt), S. M. Aleinikov (B. E. Vedeneev VNIIG), G. A. Morozov (Siberian Branch of the B. E. Vedeneev VNIIG), V. S. Antonov (AANII), I. S. Peschanskii (AANII), K. N. Korzhavin (NIIZht), and V. P. Zakharov (KazNIIÉ).

Three papers were presented at the plenary session. The paper by Doctor of Technical Sciences, Prof. B. V. Proskuryakov was devoted to the development of Soviet ice technological science over fifty years. The speaker noted that during the years of Soviet rule a great deal of attention was paid to the study of the regimes of rivers and of ice phenomena in connection with hydropower construction. Scientific groups were organized in Leningrad, Moscow, Siberia, Central Asia, Transcaucasia, B.-Baltic, and Povolzh’e (Volga region). Laboratories were established equipped with up-to-date instrumentation in which important experimental investigations were carried out. Methods were developed for combating harmful effects of ice on structures, norms of ice forces on hydraulic structures, were worked out, methods of analysis and forecasting of the ice thermal regime of water bodies and of watercourses were developed. As a result a Soviet school of ice technology evolved which occupies a leading place in the world.

Doctor of Technical Sciences, Prof. K. reviewed the development of methods of determining dynamic pressure of ice on structures; it was noted that over relatively short periods of time the physical picture of the phenomenon was investigated and substantiated methods of design were indicated. Quantitative values of parameters were recommended which are included in the design formulas, a method of determining the true ice pressure on supports of structures was worked out. However, as pointed out by the author there still are quite a few questions requiring a more thorough investigation. They include: methods of estimating the dynamic pressure of ice on structures taking into account their deformation; dynamic effect of ice on very long structures; modeling of the dynamic ice pressures on structures; the mechanism of destruction of the ice cover under dynamic influences.

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Academician V. P. Zakharov, Acad. of Sci. KazSSR discussed the regulation of the ice regime in the lower reaches of the Syr-Darya River by changing the mean daily discharges of the Chardar HES. He stated that an analysis of long-term observations of water fluctuations of water levels in the Syr-Darya channel made it possible to establish the maximum safe discharges with respect to inundation for the periods of slush-ice flow, onset of stable ice cover, stable ice cover and the break-up period. In specifying the mean daily discharges for the Chardar HES in cases when there are substantial snow accumulations in the Kara-Tau and when the flood begins in watercourses of this mountain range, it is necessary to consider this tributary flow during the break-up period in the lower reaches of the Syr-Darya River.

At the section on "Ice Thermal Regime of Open Rivers" fourteen papers and communications were presented. They were divided into two main groups: analytical-hydraulic and hydrologic. Of particular interest were the papers of B. S. Brodkin (LIVT) "Calculation of Temperature Changes Averaged Over Depth Along a Long Canal with Variable Flow" and of D. F. Panfilov, lecturer (V. P. Chkalov GIS) "Movement of a Splintered Ice Field in a River Channel Constricted by Cofferdams" in which the characteristics of the ice thermal regime of watercourses has been thoroughly discussed and design methods are proposed which show great promise in their practical application. The section noted the great importance of the coordinating conferences conducted by the Interdepartmental Coordinating Commission on the Ice Thermal Regime of Water Bodies and Watercourses at VNIIG.

The 19 papers and communications presented at the section of "Ice Thermal Regime of Reservoirs" were devoted to problems of thermal and ice regimes of reservoirs, ice jam and ice gorge phenomena in reservoirs, new analytical theoretical methods for determining the characteristics of the ice-thermal regime, and of forecasting ice phenomena in reservoirs. Among these papers the following can be noted: "On the Regularities of Spring Ice-Gorge Formations at the Back Water of Reservoirs" by Candidate of Geographical Sciences, I. Ya. Liser (the Novosibirsk Branch of the Hydrometeorcenter USSR); "Interrelationships Between the Water and Ice Regimes and the Phenomenon of Ice Gorge Formation taking into account the Orography of the Channel," by V. N. Kornovich, Engin. (Beveneey VNIIG), "Analysis of the Thermal Regime of Reservoirs during the Fall-Winter Period" by Engin. V. M. Zhidkikh and Cand. Tech. Sciences A. I. Pekhovich (B. E. Venedeeev VNIIG); "Potential Resistance of the Ice Cover" By Doctor of Geological Sciences, Prof. L S. Peschanskii; "Calculating the Coefficients of Turbulent Heat Conductivity for Wind Currents over Reservoirs" by Engineer V. M. Zhidkikh; "The Coefficient of Turbulent Mixing of the Dam Site of the Reservoir of the Bratsk HES" by Engineers Ya. L. Gotlib, M. V. Gorina, and F. F. Razzorenov (S. Ya. Zhuk Gidroproekt); "Calculations and Forecasts of Dates of Clearing of Ice In Reservoirs" by Doctor of Technical Sciences V. V. Piofrovich and Cand. Tech. Sciences S. N. Bulatov (Gidrometeo Center USSR). As was shown by the discussions all the papers were of high level and are of scientific and practical importance.


Seven papers and communications were presented before the sections on "Regulation of the Ice Thermal Regime." The most interesting one was that of Doctor of Technical Sciences Prof. V. S. Antonov (AANII) "Possible Changes in the Ice Regime of Estuaries of Large Siberian Rivers when their Flow is Regulated" (using the Lena river as an example). The author indicated that in his opinion the construction of a high head Lower-Lena HES will produce considerable changes in the ice regime of the estuary region of the Lena River. A considerable increase in flow during the fall-winter period will lead to the formation of strong fresh water ice on 1/3 of the area of the Laptev Sea, the thermal effect of river water on the ice cover in the spring will be reduced, and the ice regime of...