NONTRADITIONAL SURVEY METHODS IN HYDROTECHNICAL CONSTRUCTION

FROM THE EDITOR

The hypothesis of the physical essence of biolocation is examined in the work and the possibilities and resolution of biophysical profiling as a quick nondestructive method of detecting defects of hydraulic structures and their soil foundations are analyzed for the first time.

As a substantial factor of natural conditions affecting hydraulic and other power structures, geopathogenic zones (GPZs) as an objectively existing phenomenon of nature as well as little-studied physical, mechanical, and chemical processes in the GPZs are examined for the first time for the example of the soil mass of the bed of the upper reservoir of the Dnestr pumped-storage station. The phenomenon of the effect of discharges of atmospheric electricity on various rocks of the soil mass and earth structures, including the property of lightning plasmoids to create karst cavities by explosion and to form flint by fusion of the soil substrate, is described.

The work is published for purposes of discussion.

BIOPHYSICAL PROFILING OF HYDRAULIC STRUCTURES

V. A. Boltunov

The given work was compiled from the data of the author’s investigation in 1993 (Power Structures Research Institute (NIIES)) on the theme "Development of Recommendations on Methods of Monitoring the Geopathogenic Effect on Man and Environmental Objects) within the scope of the federal program "Environmental Safety of Russia" (ESR) obtained on a competitive basis.

Since geopathogenic zones (GPZs) at the given stage of knowledge about this phenomenon are found only by biolocation — by biooperators by means of terrestrial-radiation indicator frames, we were forced to investigate first the biolocation effect and then varieties of frames, their sensitivity and effectiveness.

For the first time we proposed a hypothesis of the biolocation effect and mathematical apparatus describing its physical essence.

In recent years the so-called biolocation method began to be used widely in our country and abroad for detecting beneath the ground surface at depths to 50 m mineral resources, karst cavities, tectonic fractures, groundwater sources, beds and lenses of rocks, taliks, and cryopags [frozen natural saline and brine waters], as well as archaeological objects — buried sites of ancient towns and settlements, burial mounds, etc. The fundamentals of this method, its physical essence were given in detail by us in [7].

We will recall briefly that it consists in an operator with terrestrial-radiation level indicator (frame) moving uniformly along a route, recording places of deviation of the indicator’s readings, and plotting the anomalies thus detected on a plan.

The applicability and resolution of biolocation was investigated by us on numerous power facilities, as a result a systems approach in using biolocation as a nondestructive method of detecting defects of hydraulic structures and their soil foundations was developed [7].

We established that the insufficient effectiveness of the known biolocation method is due to the low accuracy of determining the boundaries of anomalous zones owing to the individual characteristics of the operator’s biofield.

To increase the accuracy of determining the boundaries of anomalies caused by inhomogeneities in the soil stratum (artificial and natural), we used the method of superposition of the readings of different biosensors (biooperators), which consists in simultaneous uniform and reverse (there and back) movement of two biooperators having a different biofield along the same route [7]. This made it possible to compare their readings and unequivocally with a high confidence coefficient to evaluate verification of the results — detection of anomalies on the basis of independent readings of different biosensors and thereby to eliminate the "personal" factor.