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PROBLEMS AND PERSPECTIVES FOR THE ENGINEERING GEOLOGY IN BILGARIA

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ABSTRACT

Bulgaria is a country with high levels of geological hazard on it territory which is related to the predominance of various and mainly complex engineering geological conditions on its territory. With the acceptance of the Law for Regulation of Territory the engineering geological investigations were established as an obligatory stage for compiling the regulation plans and the engineering geological reports were constituted as an irrevocable part of the constructions design. The strategic objectives of the engineering geology at the present state are the compilation of engineering geological map of the country in scale 1:25000, regional digital models of the geological hazard, monitoring of dangerous geological processes, engineering geological background for seismic microzoning. Major problem of the engineering geology in Bulgaria is the lack of consolidated state policy and of a unique administrative body that should coordinate and control the engineering geological activities mainly on regional and national levels. The presence of still highly qualified professionals and reasonable administrative decisions will highly contribute to the realization of a series of actions related to prognostication and management of the geological hazards. This will reflect in a considerable and long-lasting financial and economic effect.

The engineering geology is a science with in Bulgaria. The process of construction of the national infrastructure was realized in highly varied and complicated geological conditions of the territory was inconceivable without the engineering geological studies. In this field worked eminent specialists as R. Beregov, D. Yaranov, B. Kamenov, A. Demirev. The accumulated experience, unfortunately not always successful, contributed to the creation of highly qualified professionals. One of the most considerable national achievements of the engineering geology for the period were the elaboration of engineering geological map is scale 1:500000, the extended prospections for hydrotechnical constructions, for the Dobrubja coal basin, the investigation of the large landslides along the Black Sea coast and the Danube river bank, the ambitious "Asparokh val" project, the Kozlodui and Belene nuclear power stations sites, the exploration and exploitation of Maritza coal basin.

With the close down of the Committee of Geology the state completely retired from its tender engagements towards the geological science and practice, that was a serious impact on the Bulgarian geology. That was not as painful for the engineering geology as till that moment its activities were not such centralized. After numerous re-organizations during the planned economy period the management of the engineering geological activities was quite chaotic. Different structures established in different ministries worked with no co-ordination between them. The scientific work was concentrated in the Geological Institute of BASc., the department of Hydrogeology and Engineering Geology in the UMG and the present department of Geotechnics in the UACG. The practical activities were carried out by the geological departments of the state specialized departmental project and design companies as "Energoproject", "Vodokanalproject", "Vodproject", "Zavodproject", "Minproject", "Patproject" etc. The protection of the territories was governed by the regional anti-sliding directions in Varna, Pleven and Pernik, which further were unified in the National Works for Drive against Landslides and Abrasion under the direct management of the Committee for Territorial, Town and Villages Planning. Occasionally some typically engineering geological projects were transferred to the Committee of Geology, for example the studies of the impacts of the Strajitza earthquakes. The major regulative documents as "Rules for Plane Foundations" and other parts of the Bulgarian State Standards were elaborated in the National Institute of Civil engineering. The Major Prices Administration and the Ministry of the Finances issued costs regulations documents. The scientific departments of the different state departmental project and design companies compiled and constantly re-edited manuals, branch regulations etc. The engineering geological information was available in geo-stocks of the state companies and in the State Stock but often the field campaigns were doubled due to the extensive character of the economy.

The training of the professionals was realized by the UMG (for engineering degree) and from BASc (for doctorial degree) with the help of skilled and highly qualified scientists. The acquisition of a minimal practical experience during student education was realized during practical teaching at equipped educational sites and during the obligatory individual practical training in appropriate companies. The submitted at the end of the education Diploma Reports were elaborated on important projects with large amount of initial data.

Despite of the chaotic management and the scarce communications the engineering geological body to great extend succeeded to act in collaboration in organizing conferences, seminars, qualification courses. The scientific

and the applied information were effectively disseminated. The Centre for Earth Sciences of BASc issued the thematic series "Engineering Geology and Hydrogeology" that was umpired from the most competent foreign editions. Periodical issues were compiled form the greatest training companies as well. All scientific materials were published in considerable prints. Extremely rich information was acquitted from available Russian literature as well other foreign editions.

During the transition period these small achievements were destroyed and new did not happen. The major, in continuous, problem is the lack of executive state authority that will plan, finance, control and approve all engineering geological activities. Such kinds of authorities are established in all states suffering the impacts of hazardous geological processes. Both in the past and in now-a-days it is not realizes that the dangerous geological processes are defined by regional geological factors, they affect simultaneously great territories and for their management are necessary management decisions of national state level.

Actually the management and the financing of the engineering geological activities are even more decentralized. The scientific work is planned and reported in the Geological Institute of BASc. Recently with similar matter was engaged the Institute of Water Problems of BASc. The planning and a part of the protectional activities in the populated areas are managed by the Ministry of Regional Development and Public Works with finance support from its own budget and the Permanent Commission for Disaster Prevention. Landslides along the roads are from the competence of the Executive road Agency. The Ministry of the Environment and Water finances several regional projects on engineering geological monitoring. The engineering geological prospections of granulates quarries are approved by the Ministry of the and Communications Permanent Commission for Disaster Prevention finances the reclamation after disastrous events either directly or through the local authorities. The dangerous processes along the rail-ways is supported and approved by the Ministry of Transport and Communications. The Ministry of the Energy and Energy Recources is dealing with the engineering geological problems in the coal mines and the energetic system sites.

The control on the engineering geological activities, when available, is practiced in different manners. The financed from the Ministry of Regional Development and Public Works projects are subjected to investor's supervision realized by "Geogard" companies or from other independent supervisors. The financed from the Ministry of the and Communications projects are submitted to its High Expert Council. The financing from the Permanent Commission for Disaster Prevention is rendered in and Communications Councils for Territorial Planning where the participation of engineering geologists or geotechnitians is a matter of good will. These Councils approve the designs of geo-protective structures. The assumption of implicit consent is practiced where the invited professional, no matter if he attended the Council meeting, in 14 days does not present a written statement on the he is considered to accept the concerned project. The practice in other ministries is quit similar.

A considerable part of the engineering geological activities is financed by companies or private persons. Such are 100 % of the engineering geological investigations for civil structures. Most of these investors seek a minimum cost of the campaign that is decisively reflecting on its quality and on the costly constructions.

The absence of centralization caused important and irreversible losses. Practically all huge information stocks of held in different state companies and structures were destroyed. There is no state concept for decreasing the geologic hazard in the country. The "Geogard" services are registered as "commercial" companies with insufficient staff and limited state financial support which makes them to deal with alien commercial activities. The declared in the technical regulations engineering geological background of urban territories necessary for the initial study and final designs for certain engineering structures is still not elaborated. The impossibility of centralized informational services results in direct and mediate financial losses for the state. The authors are acquainted of tens of cases of failed investment projects due to lack of preliminary information for the unfavourable geotechnical conditions. At least three of the cases were related to major foreign investors.

Serious problems, as in many other fields, are regarded to the trained professionals. Although the engineering geology as a closely related to civil constructions branch is not in direct financial dependence from the state the average age of its professionals is getting higher. It is difficult for young people to get in the area due to numerous causes. The major one is that the university degree is not sufficient. Couples of years of practice are a must. In the past that was provided from the state. Great part of the present acting specialists was trained on the "probe-error" principle which actually no investor shall welcome. Being a sore subject it should be admitted that the educational quality reveals a significant dropdown. The problems arise with the decreased criteria in the secondary schools, the low social prestige of the geological studies (not only in the Bulgarian syndrome), inadequate payment in the educational spheres, lack of motivation, low computer skills and linguistic training (especially in Russian language regarding the available sources), practically inaccessible western editions, lack of educational textbooks. It is very indicative that with labour agreement (in the structure of BASc) are only two engineering geologists with higher degree of habilitation. In the UMG, the unique school for training specialists with bachelor's and master's degree in engineering geology there is no lecturer with higher degree of habilitation. In UACG there are no habilitated lecturers in engineering geology.

The body of engineering geology in Bulgaria is trying to react against the chaos in the state management. In 2000 was established the Bulgarian National Association of Engineering Geology and Hydrogeology with mail targets to ameliorate the activities in the field and to protect the interests of the engineering geologists and the hydrogeologists.

What is the future of the Bulgarian engineering geology? Two scenarios are possible. The pessimistic one supposes actual physical liquidation of the engineering geology and in

the near future its activities should be carried out by foreign companies and consultants.

The optimistic scenario is possible if only the state recuperates its functions in the field of geology and namely of the engineering geology. Its high time to be realized that the natural hazard is related exclusively to the dangerous geological processes (earthquakes, landslides, rock falls, mud streams). These are in essence geological processes, triggered by regional geological factors and affecting large territories. In these terms their study, prognostication and management must be organized at regional levels that is not in the capacities of the small and medium commercial subjects.

In practical aspect it is of primary necessity to create a National Council (National Geological Service) with the task of strategic planning of the geological (engineering geological) activities and of a Executive State Body (Executive Agency) with the task of managing and control on the geo-protective (in particular the engineering geological) activities. The main targets of the last should be: elaboration of rules and regulations, creation of data base for the engineering geological conditions (geologic hazards) in the country in a reasonable for the territory planning and information services of the authorities scale; development of long-term strategy and assignment of tasks in the field of the scientific and methodological developments; assessments of the relevance, the volume and the content of the engineering geological activities with state financing, control and approval of their results, including those evolved Law for Regulation of Territory; consulting of corporations and private persons on the activities they are financing separately; support of the professional education and post-educational qualifications; issuing of a periodical for the innovations in the geotechnical field.

The most urgent tasks to be worked on are: compilation of a legend for the existing engineering geological map of the country in scale 1:25000 relevant to the contemporary concepts for the natural hazard, the principle of analysis, synonymity and openness; collection, evaluation and systematization of still not destroyed engineering geological information on the base of 1:25000 scale; conducting an mapping campaign in the regions with no sufficient or reliable information on their engineering geological conditions.

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