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## **COOPERATION OF UKRAINIAN SOCIETY FOR SOIL MECHANICS, GEOTECHNICS AND FOUNDATION ENGINEERING WITH INTERNATIONAL SOCIETY ISSMGE**

*Information about cooperation of Ukrainian Society for Soil Mechanics, Geotechnics and Foundation Engineering with International Society for Soil Mechanics and Geotechnical Engineering, the results of Ukrainian society activity and prospects of its development are presented in paper. It is considered participation of Ukrainian specialists in International and regional conferences; results of the ninth All-Ukrainian scientific and technical conference «Soil mechanics, geotechnics and foundation engineering: problems, innovations and implementation of Eurocodes in Ukraine» and prospects of Ukrainian society development.*

**Keywords:** *International society for soil mechanics and geotechnical engineering, Ukrainian society for soil mechanics, geotechnics and foundation engineering.*

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## **СПІВПРАЦЯ УКРАЇНСЬКОГО ТОВАРИСТВА МЕХАНІКИ ҐРУНТІВ, ГЕОТЕХНІКИ І ФУНДАМЕНТОБУДУВАННЯ З МІЖНАРОДНИМ ТОВАРИСТВОМ ISSMGE**

*Наведено інформацію про співпрацю Українського товариства механіки ґрунтів, геотехніки і фундаментобудування з Міжнародним товариством механіки ґрунтів та геотехніки, зокрема про результати діяльності Українського товариства і перспективи його розвитку. Розглянуто участь українських фахівців у міжнародних та регіональних конференціях; результати дев'ятої Всеукраїнської науково-технічної конференції «Механіка ґрунтів, геотехніка і фундаментобудування: проблеми інновації та імплементація Єврокодів в Україні».*

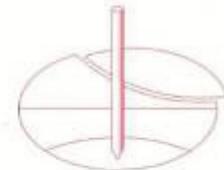
**Ключові слова:** *Українське товариство механіки ґрунтів, геотехніки і фундаментобудування, Міжнародне товариство механіки ґрунтів та геотехніки.*

**Introduction.** The All-Ukrainian Public Organization «Ukrainian society for soil mechanics, geotechnics and foundation engineering» (UkrSSMGE) as juridical person has been established in 2001 on the constituent congress of the delegates from all Ukraine regions. Kyiv's national University of construction and architecture, Odesa state Academy of Iconstruction and architecture and State enterprise «Research Institute of building constructions» have been the initiators of its establishment.

In 2003 UkrSSMGE was admitted to membership of International society for soil mechanics and foundation engineering (ISSMGE).

**International Society for Soil Mechanics and  
Geotechnical Engineering**

**Société Internationale de Mécanique des Sols  
et de la Géotechnique**



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30<sup>th</sup> November 2004

**CERTIFICATE**

All-Ukrainian Public Organization "Ukrainian Society for Soil Mechanics, Geotechnics and Foundation Engineering" has been a full member of the International Society for Soil Mechanics and Geotechnical Engineering since August 2003.

PROFESSOR R. N. TAYLOR  
SECRETARY GENERAL  
30 NOVEMBER 2004



**Figure 1 – Certificate issued for Ukrainian society**

**Analysis of recent sources of research and publications.** Cooperation between UkrSSMGE and ISSMGE is leading by two directions [1 – 4]:

1) Organization of the Ukrainian specialists participation in International and regional conferences with reports deal with national achievements in area of geotechnics, particularly in decision of the complex issues in interaction system «soil base – foundation – structure» in different engineer-geological, natural and anthropogenic conditions. Ukraine has support from ISSMGE as the increased quotas for papers quantity for these conferences. Young Ukrainian geotechnics get the ISSMGE grants on free of charge participation in youth conferences under auspices of ISSMGE.

2) Receiving of significant number of scientific documents deal with world achievements in geotechnics field, including materials deal with complex problems of interaction of the geotechnical and structural decisions and seismicity.

**Identification of general problem parts unsolved before.** Today, the information about cooperation of Ukrainian Society for Soil Mechanics, Geotechnics and Foundation Engineering with International Society for Soil Mechanics and Geotechnical Engineering and the results of Ukrainian society activity and prospects of development its is necessary to analyses.

**Purpose of this paper** is to inform the Ukrainian geotechnical engineers about cooperation results with International society for soil mechanics and foundation engineering.

**Basic material and results.**

*1 Participation of the Ukrainian specialists in International and regional conferences*

The most developed side of cooperation between UkrSSMGFE and ISSMGE is participation of the Ukrainian geotechnical engineers in International, regional and thematic conferences. Particularly, the 18-th International conference on soil mechanics and geotechnics (September 2013, Paris, France) under slogan «Challengers & innovations in geotechnics» was devoted to innovation solutions in geotechnics [1]. Significance of geotechnics for environment protection, behavior of system «soil-foundation-structure» out the seismic collapse boundary, enhancement of pressiometric tests usage, geotechnics place in maintenance of historical monuments etc. was considered on plenary session. Ukrainian geotechnical society has been presented 5 reports which were included in conference proceedings.

The specialized exhibition was organized in conference frames. More than 70 firms from all over the world took participation and 20 major firms have been the sponsors for this measure.

On September 2015 the 16-th European geotechnical conference under slogan «Geotechnics for infrastructure and development» hold in Edinburg (Great Britain) [2]. More than one thousands delegates participated in that measure and approximately 400 reports were presented there. Ukraine presented 6 reports which were published in conference proceedings.

On September 2017 both the 19-th International conference on soil mechanics and geotechnical engineering 6-th young geotechnical engineers' conference hold in Seoul (Korea). On the first from them, Ukraine presented 2 reports:

- Innovative projects in difficult soil conditions using artificial foundation and base, arranged without soil excavation (authors from Kyiv, Poltava, Zaporog'e and Dnipro);
- Innovative design and technological solutions and test method for pile supports with increased bearing capacity (authors from Odessa and Kharkiv).

UkrSSMGFE assisted to society member O. Samorodov to get the grant from conference organizers (Korean geotechnical society) for free of charge participation in conference.

Ukraine has presented too two reports on the young geotechnics conference:

- Design of foundations for low-rise buildings in dense urban environment (author M. Korzachenko, Chernigiv);
- Method for determining bored piles load-bearing capacity, taking into account the direction of vertical loading in water-saturated soils (author S. Tabachnikov, Kharkiv).

UkrSSMGFE assisted to S. Tabachnikov to get grant from ISSMGE for free of charge participation in conference.

By the way, the next geotechnical conferences would be held such way:

- 16-th European Danube geotechnical conference ([www.decge2018.mk](http://www.decge2018.mk)) – in 2018 in Skopje, Macedonia;
- 17-th European geotechnical conference under slogan «Geotechnical engineering – foundation for the future» – in 2019 in Reykjavik, Island.

## *2 Analysis of the International conferences materials*

The following problems, which are actual ones for nowadays for construction activity in the world, may be mentioned wholly according to reports:

- physical and math modelling and laboratory researches;
- peculiarities of seismic impact to structures and facilities when different soil behavior;
- soil and structures interaction; – foundation engineering in complex soil conditions;
- offshore geotechnical problems; geotechnics in safety system and objects operational suitability;
- underground construction; shallow foundations;
- sustainable geotechnics; thermal geotechnics;
- uncertainties in modern geotechnical codes.

All abovementioned is showing the great potential of the scientific and technical decisions in international practices. This potential should be studied, analyzed and used for development of national science and construction practices.

Resume of the international conferences shows the reasonability for participation activation of relevant institutes, Universities and industrial organizations participation in the international organizations activity with purpose the more operative survey and using of the world scientific and technical achievements. It concerns to participation of Ukrainian specialists in work of Technical commissions and Work groups and active presentation of the national geotechnical achievements on the international level.

Modern state of information change in Ukraine may be assessed as satisfactory. The thematic conferences and seminars are organizing yearly on the wide spectrum of scientific problems of concrete, reinforced concrete and geotechnics. The specialized journals are publishing by Universities and trade Institutes. The same measures are organizing in other CIS countries. But analysis of advanced international experience should be better.

Ukraine has significant construction problems. We have the some complex engineer-geological conditions for construction; it is territories with sedimentary rocks, above mine working, karsts, underground facilities and catacombs in cities, dangerous landslide in mountains and on sea coasts; up to 20% of state territory is situated in seismic dangerous zones [3]. That fact significantly influences not only on the new construction but on suitability support of the existing old construction objects with significantly out-of-repair resource of the building structures.

In last decades the hydrogeological conditions were changed significantly because of influence of human factor. This fact increases the risks for the objects integrity because of soil conditions change.

Studying and generalizing of the international experience can ensure for us (without significant discharges on structures development, research and test) to reach wide potential for solution of the geotechnical problems existing now in Ukraine.

## *3 The ninth All-Ukrainian scientific and technical conference «Soil mechanics, geotechnics and foundation engineering: problems, innovations and implementation of Eurocodes in Ukraine»*

Conference was organized and conferenced by State enterprise «State research Institute of building constructions», SHEE «Prydnsprovs'ka State Academy of Civil Engineering and Architecture», All-Ukrainian Public Organization «Ukrainian society for soil mechanics, geotechnics and foundation engineering» and journal «Geotechnics world» to meet the plan of Ministry of regional development, construction and communal services of Ukraine [4].

Scientists from Ukraine, Azerbaijan, Byelorussia, Iraq, Kazakhstan, Mauritius, Germany, Poland, France and Czech Republic have participated in conference. General number of the papers, which is included in Interdepartmental scientific and technical collection «Building structures», is 134 ones.

The general and specific construction problems in complex Ukraine engineer-geological conditions, the theoretical and practical aspects of designing in accordance with Eurocodes, the state and prospects for development of Ukrainian normative geotechnical base, the increasing of quality and effectiveness of engineering searching for construction, the progressive structures and modern technologies for foundation engineering and other were considered on conference.

ISSMGE President Prof. Roger Frank (Paris, France) and former ISSMGE vice-president Prof. Ivan Vanichek (Prague, Czech Republic) have presented the key reports during plenary session.

Four sessions worked during conference:

- session 1. Geotechnical innovations, implementation of the Eurocodes in Ukraine;
- session 2. Modern problems of soil mechanics, soil science and engineer geology. Classification and methodology for its design parameters determination;
- session 3. Foundations and structures interaction. Design systems «base – foundation – structure» in conditions of natural and artificial bases;
- session 4. Construction in complex engineer-geological conditions. Modern technologies for bases and foundations arrangement.

Besides that, the «round table» on the issues of implementation of the European Codes in practices of buildings and facilities designing, construction and operation has been organized with foreign specialist's participation. The ways for elaboration of the practical manuals deal with using of DSTU-EN and for teaching of the bachelors and masters on specialty «Construction and civil engineering» were planned.

Conference has stated the following.

Implementation of the geotechnical researches in the Ukrainian Universities, scientific and design organizations is activated in spite of prolonged recession in construction engineering. It is characterizing as spreading of themes well as using of the new research methods and novelty and practical value of the gotten scientific results. It is perspective for improvement of the structural decisions for both underground and upper part of different structures; for search of the economical schemes, methods of bases preparation and methodology for foundations and buildings of civil, hydro-technical, road, military and other purpose installation, for engineering protection of the existing and new objects, for its retrofitting. There are given proposals for development of the normative base with using of Eurocodes principles. Such position of the conference participants is explaining their social responsibility to state.

At the same time, some reporters were concerned about low level of state bodies care about construction science development and engineer training in accordance with requirements of European educational space.

Conference has noted following moments:

- high actuality of considered issues;
- reasonability of Ukrainian society involving in development of normative base deals with geotechnical design problems on base of international and national experience;
- implementation of Eurocodes in geotechnical design permits to use European experience and advanced technologies. It permits to save the expenditures during buildings construction up to 20-40 % and to increase the foundation durability on weak soils.

On conference opinion the following activity directions deal with scientific problems of geotechnics, soil mechanics and foundation engineering are prospects:

- protection of the buildings and facilities against abnormal deformation of soil bases and complex geological influences, including joint interaction of the bases-foundations-structures;

- development and implementation of the effective methods for soil consolidation and quality soil improvement;
- protensity of the researches and technical decisions development for the buildings and facilities on underworked territories;
- considering trends dealing with territory under-flooding and soil water saturation;
- development of the methods for strengthening of the existing buildings and facilities foundations (including historical and architectural monuments), iits monitoring and abnormal tilts liquidation;
- studying and using of the advanced Ukrainian researches and international experience in geotechnics engineering;
- equipping of the research organizations and industrial enterprises with modern test equipment for ensuring of normative base development.

#### *4 Prospects of Ukr.SSMGFE development*

New conception for Ukrainian society development has been adopted on conference to listen to reports and elect new officials. It has been held on March 2017. There are its basic theses.

- 1) Activation of the scientific and technical assistance to production:
  - conduct of the conferences, seminars and «round tables» with participation of the industrial organizations (reports about complex problems, technical achievements, normative base and implementation of progressive technical decisions);
  - participation widening in international measures, including presentation of the national technical achievements;
  - generalization and processing of the advanced experience for its using in production activity, normative base and education.
- 2) Improvement of the organization work in society:
  - rejuvenation of society, specification of regional units structure, renovation of Presidium structure;
  - widening of the thematic sections in society and ensuring of the horizontal relations between regional units;
  - participation on society members in work of ISSMGE technical committees;
  - actualization of database on the advanced scientific-technical, innovation and calculation – design decisions on base of the problems arising in manufacturers and designers;
  - complex work in society, including the thematic sections and work groups on the contiguous directions of activity (structures, seismic etc.) considering the cooperation with international organizations on these directions;
  - holding of the young geotechnical conferences;
  - wide information activity (normative base, publications in the international editions and other).

The prospective and annual plans are elaborated by society Presidium for this conception implementation. The regional units are informed about these plans.

**Conclusion.** The following tasks are actual ones for society and its Presidium.

1. Generalization of the international and national conferences experience and implementation of that experience.
2. Activation of relevant institutes, Universities and industrial organizations participation in the international organizations activity with purpose to monitoring more operatively and use the world scientific and technical achievements.

3. To stimulate the society members to maximal using of advanced experience when creation and renovation of the national normative base in construction engineering.

4. To use that experience in educational sphere.

5. It is reasonably to organize the society members participation in the other international societies – International federation for structural concrete (FIB), International and European associations for earthquake engineering (IAEE and EAE) and other ones, where the modern geotechnical problems are under consideration.

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