

Relaunch of the Commission 28 “Reliability quantification of the geological model in large civil engineering projects”

This note is intended to inform the IAEG president and general secretary on the relaunch of the Commission 28 titled “Reliability quantification of the geological model in large civil engineering projects” (hereafter C28).

The C28 was established on 2009 by the Council meeting, on the proposal of Antonio Dematteis, who was at that time the chair of an IAEG national working group in Italy, working on a Guideline on the Reliability Assessment of the Geological Model.

On 2012 the Guideline on the Reliability Assessment of the Geological Model was published by the Italian chapter of IAEG on his website. The Guideline was also translated into English by the Italian chapter, in order to be used within the C28 with the aim of developing it with international standards.

On 2014 the C28 organized the workshop “Facing with Geological and Geotechnical Uncertainty” during the XII International IAEG Congress in Turin.

Since then the C28 has not produced further initiatives or documents, mainly because has not managed to develop an adequate international network.

However, the topic treated by the C28 is still of great importance and interest in the engineering geology applied to the market of large civil works. The reliability assessment of geological and geotechnical uncertainties is increasingly required to improve the quality and safety in design, contractual management, the risk sharing management and the financial management during planning, construction and maintenance phases in all major civil works projects.

A new condition is being created to relaunch the C28, which meets a real need for further study and development of this specific field of the engineering geology. As a matter of fact, quantitative information to build geo-engineering subsoil models come from several new devices and technologies like satellite probes, multiple types of aerial data acquisition systems, indirect geophysical investigations, underground coring, logging and testing probes and point diffuse monitoring networks. They all contribute to enrich geo-datasets of tens of parameters that are stored in large databases commonly managed through GIS-based platforms and software interfaces to numerical 3D terrain models. Nonetheless, the abundance of data taken at different location and time provides a new challenge for scientists and professionals in geo-engineering that is integrating diverse spatial and temporal datasets to describe the present and changing conditions of the Earth at different reliability levels. Hence, the data fusion perspective put geologists and geo-engineers in front of a new quantitative perspective that cannot avoid the geological judgement but needs an additional sensibility and awareness to information technologies, machine learning, geostatistical and artificial intelligence methodologies.

To this end the C28 will work to spread out this renewed approach to geo-

engineering modelling towards the civil engineering designing by means of Conferences, Reports and continuous learning activities such as summer and winter schools, workshops, webinars, etc even joint to C25 “Use of engineering geological models”. The cooperation with the ISSGME society especially with TC304 (Engineering Practice of Risk Assessment & Management) and TC309 (Machine Learning) will be another crucial point of the new C28 chair and its members’ activity.

Proposed change of title

The current title of C28 is proposed to be slightly changed as follows: “The reliability assessment of the geological and geotechnical design models in large civil works”.

This change aims to include (or rather not exclude) the use of qualitative methods for the study of the reliability of the models, in addition to the quantitative ones, to better define the engineering geology discipline, which deals not only with geology, but also with geotechnics and geomechanics, and to better clarify the purpose of the models, which are applied here to the design and construction of civil works.

Scope of work

The scope is confirmed.

Members

This aspect is critical and crucial for the C28’s relaunch.

- Antonio Dematteis, Lombardi Engineering Ltd, Australia, antonio.dematteis@lombardi.group.
- Giovanna Vessia, Assistant Professor in Engineering Geology, University G. d’Annunzio Chieti-Pescara, Via dei Vestini, 31, 66100 Chieti, g.vessia@unich.it
- Diego Di Curzio, Assistant Researcher in Engineering Geology, University G. d’Annunzio Chieti-Pescara, Via dei Vestini, 31, 66100 Chieti, diego.dicurzio@unich.it, Italy.
- *list to complete...*

Time schedule – Activities to be developed

Sponsorship

TC304/TC309 Joint International Symposium – MLRA2021 - Machine Learning & Risk Assessment in Geoengineering (Wroclaw 2021), to be held in Wroclaw, 15-17 March 2021 (<http://www.MLRA2021.pwr.edu.pl>).

C28 Restart meeting during MLRA2021 in Wroclaw.

References

- Guideline on the reliability assessment of the geological model. The Italian group of IAEG, September 2007, http://www.iaeg.it/comm_opere_sott.htm.
- IAEG-C25: Use of engineering geological models.

IAEG

*International Association for Engineering
Geology and the Environment*

COMMISSION 28

Reliability quantification of the geological
model in large civil engineering projects

<https://www.iaeg.info/commission-25-use-of-engineering-geological-models/>.