



IAEG C 28 - Reliability quantification of the geological model in large civil engineering projects

Glossary

Reliability of a geological model. The reliability of a geological model represents an assessment of the model capability of describing the real-world geological setting. During the design phase the geological investigations will allow to assess the reliability level of the geological model; during the construction phase this degree will be verified. The scale of the reliability analysis has always to be defined.

Quantification. The quantification has to be performed following well defined methods. The latter could include classification indexes (i.e. the classification indexes that are commonly used in rock mechanics, as RQD, RMR, etc.), or stochastic approach, based on probability analysis of the data, or mathematical (numerical) modelling.

Geological model. The geological model is a three-dimensional reconstruction of the geological setting and describes temporal and spatial distribution of the geological features that characterize the study area. It's a logical re-construction that combine data collected with the geological survey, deep investigations (i.e. boreholes, geophysics, etc.) and laboratory tests performed during a specific moment of the project. The model evolves after his first version with new data provided during the design and the construction phases: the new data may be in agreement with the geological model, improving its reliability, or they can suggest a revision or even a complete new definition of the model.

Large civil works are, for instance, roads, railroads, hydroelectric power plants, with particular reference to the works in underground. The adjective "large" aims at distinguishing these works from current constructive importance buildings, where constructions is relatively simple (i.e. houses, buildings or smaller facilities).

Guide Line. The guide line must point out the criteria and the essential parameters to be considered for evaluating the reliability of the geological model. It must also point out the procedure to be adopted during construction to monitoring forecast accuracy. Guide line must consider ISO Norms and Suggested Methods proposed by the *International Society for Rock Mechanics (ISRM)* and the *International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)*.