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Foreword

“*Scientia potentia est*” a phrase which has been going through the history of a mankind undisputed and was attributed to many great minds all across the globe. The knowledge base in dam engineering gathered over past decades and centuries is enormous and in detail already too vast for a single man to comprehend. Recent developments in different parts of dam engineering from planning procedures, through design and construction to operation expand the available knowledge even further. Transfer of the applied knowledge towards new generations of dam engineers as well as promotion of new ideas is necessary for sustainable development of water management, vital for the modern civilisation to survive next century and it presents the objective of the ICOLD 2017 Symposium.

The Symposium is divided into nine themes to cover the particular areas of interest:

1. Investigation and application of advanced materials, technologies and solutions in dam engineering
2. Enhancements in dam surveillance systems for dam safety and site security
3. Uncertainties and risk-informed decision making in dam design, construction and operation
4. Balancing technical, socio-economic and environmental aspects of dam engineering
5. Advancements in analysis and design within flood protection reservoirs, levees and tailing dams
6. Recent improvements and modern applications in reservoir and catchment management
7. Design and operational considerations of global climate change, regional droughts and other extreme events
8. Assessment of aging dams considering remaining service life and decommissioning
9. Hydro-electro-mechanical equipment of dams

The themes of the Symposium attracted 459 abstracts unequally distributed between nine themes with 132 abstract in theme one and 12 in theme nine. Impartial review process of submitted papers resulted in recommending 302 papers from 43 different countries to be published in the Proceedings. In order to respect the unstoppable advance towards replacement of paper printed Proceedings by electronic media we introduce printed Book of abstracts which contain single page extended versions of abstracts accompanied with figures, while full papers are published in the electronic version of the Proceedings.

We would like to thank all the authors for their efforts and contributions to the Symposium. Based on reviews and authors preferences we selected 76 papers from 37 countries for oral presentation in three parallel sessions. Additionally, 188 authors were offered poster presentation. We believe, that the location of the posters and time reserved for them allows for serious technical discussion over the particular topics.

All abstracts and papers submitted for the Symposium were subjected to a standard peer review process evaluating originality, novelty and innovation, technical soundness and contributions of the paper and formal qualities such as clarity of figures and graphs, overall presentation and references. The reviewers were assigned based on their field of expertise but worked without further interferences from the organizing committee. On behalf of the organizing committee, we would like to express our deepest gratitude towards all the members of review panel for their effort, which undeniably enhanced the level of Symposium.



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Contribution ID: 8

Waves in underground pumped storage plants

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Underground pumped storage plants do not exist yet, but plants with their function are essential for a sustainable energy supply system with a high amount of renewable energies. To ensure the required balance between energy production and energy demand the plants have to be operated in a specific manner. According to the design of the underground caverns waves occur. This work presents the waves occurring in underground pumped storage reservoirs according to their design and operation. The results have been achieved due to hybrid modelling, which means here a combination of experimental investigations and CFD simulations (3D/2D). The results that imply the wave types and their manner are the basis for the design criteria of underground pumped storage reservoirs and go far beyond the current state of knowledge. Future design developments of underground pumped storage plants depend strongly on the present results.