

**INTERNATIONAL COMMISSION ON LARGE DAMS
DANISH AND ICELANDIC NATIONAL COMMITTEES ON LARGE DAMS**

**COMMISSION INTERNATIONALE DES GRANDS BARRAGES
COMITES NATIONAUX DANOIS ET ISLANDAIS DES GRANDS BARRAGES**



**INTERNATIONAL SYMPOSIUM ON ANALYTICAL
EVALUATION OF DAM RELATED SAFETY PROBLEMS**

COPENHAGEN, WEDNESDAY JULY 5, 1989

PRESENTED PAPERS VOLUME I

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FOREWORD

A full-day scientific symposium has now become an established event in connection with the annual Executive Meeting of ICOLD. Such a symposium is a valuable forum for dealing with specific problems of the dam building profession in more depth than is possible during a large congress.

Although dams have been built in the world for more than three thousand years, most dams are less than a century old. The aging of these dams and appurtenant structures and the consequent increasing maintenance is now becoming a problem in many countries. The public is now much more aware of possible dangers related to dam failures and also of the impact of the structures on the environment, and safety problems of dams have therefore become one of the most important issues of today.

The organizing committee of DANCOLD and ISCOLD took notice of this trend when "Analytical evaluation of dam related safety problems" was selected as the subject for the Symposium of the 57th Executive Meeting in Copenhagen 1989. During the preparation of the Symposium we have obtained valuable advice and assistance from the members of the "Ad Hoc Committee on Computational Aspects of Analysis and Design of Dams" of ICOLD and we wish to express our warmest thanks to them for their contribution.

We are pleased with the response we received to our announcement and call for papers. It confirms that the topic of the Symposium is a real and important issue. We received 37 papers from 16 countries on the subject, of which 24 papers were on "Theme A: Concrete Dams - Fracture Problems" and 13 papers were on "Theme B: Embankment Dams - advanced analytical models for prediction of behaviour, particularly concerning erosion by overtopping and piping". We wish to thank the authors of the papers and the National Committees for their work and important contribution to the subject.

In this volume we are publishing the presented papers. We have divided them according to the themes and subdivided them according to aspects dealt with. Each theme is introduced by a State-of-the-art report prepared by the Ad Hoc Committee, printed with the permission of the committee.

Finally we would like to thank the members of the scientific committees: Chairmen, general reporters and experts of the panels for their valuable assistance in the preparation of the Symposium. We sincerely hope that the ICOLD Symposium in Copenhagen in July 1989 will benefit the dam building profession.

Pall Olafsson
Vice Chairman of the
Organizing Committee

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