Technical Committee Workshops

Non Linear Modelling of Concrete Dams

Committee “A”

Computational aspects of analysis and design of dams

Guido Mazzà

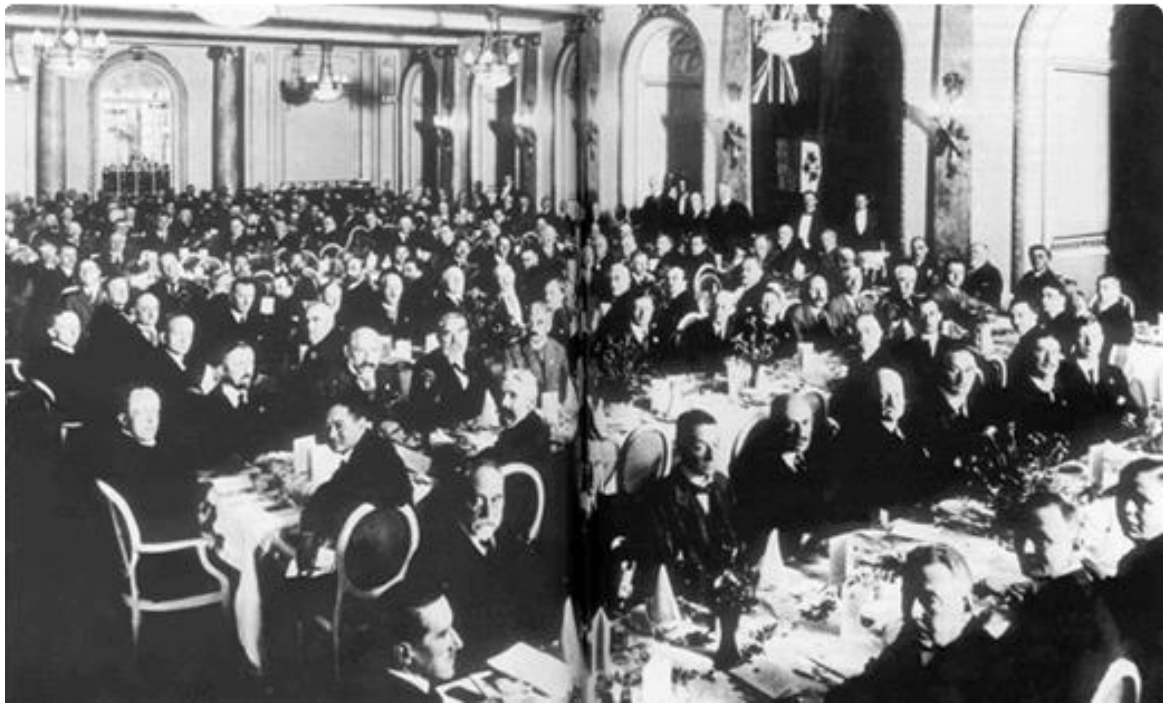
CONTENT

- About the Technical Committee “A”
- The past activities of the Committee“A”:
  Technical Bulletins & Benchmark Workshops
- Activities in progress
- Concluding remarks

ABOUT THE TECHNICAL COMMITTEE “A”

ICOLD established the **Committee “A”** in 1988 as an *ad hoc* Committee.

In 1995 the Committee was given the status of a “permanent” Committee.



The Committee “A” has strongly contributed to create a bridge between specialists of numerical modelling and dam engineers and to spread knowledge in the field of numerical modelling.

ABOUT THE TECHNICAL COMMITTEE “A”

Past, present and future **activities of the Committee “A”** are basically oriented towards:

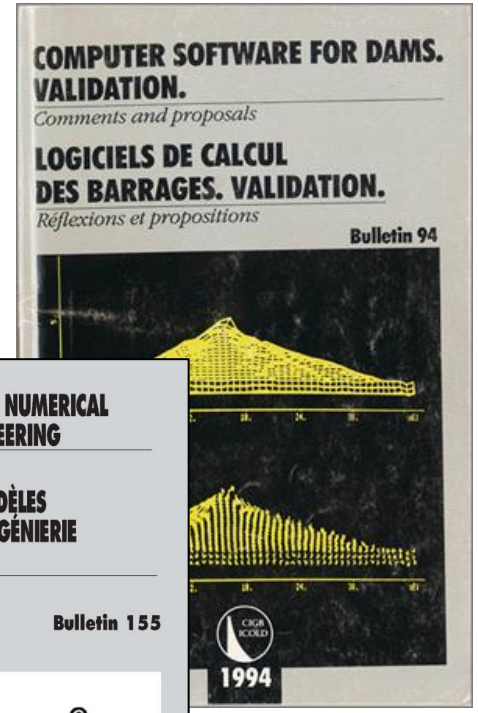
- Creating a stronger **link** between the **modelling process** and the **observed dam behaviour**
- Promoting **mathematical modelling improvements** to approach safety-related problems, in particular those that cannot at present be properly analysed
- Issuing **guidelines to be used in current practice**, for educational purposes and knowledge transfer

THE PAST ACTIVITIES OF THE COMMITTEE “A”

Bulletin N. 94 (1994)
Computer software for dams. Validation

Bulletin N. 122 (2001)
Computational Procedures for Dam Engineering

Bulletin N.155 (2013)
Guidelines for use of numerical models in dam engineering



THE PAST ACTIVITIES OF THE COMMITTEE "A"

1st	Bergamo (Italy)	1991
2nd	Bergamo (Italy)	1992
3rd	Paris (France)	1994
4th	Madrid (Spain)	1996
5th	Denver (USA)	1999
6th	Salzburg (Austria)	2001
7th	Bucarest (Romania)	2003
8th	Wuhan (China)	2005
9th	St. Petersburg (Russia)	2007
10th	Paris (France)	2009
11th	Valencia (Spain)	2011
12th	Graz (Austria)	2013
13th	Lausanne (Switzerland)	2015
14th	Stockholm (Sweden)	2017
15th	Milan (Italy)	2019
16th	Ljubljana (Slovenia)	2022





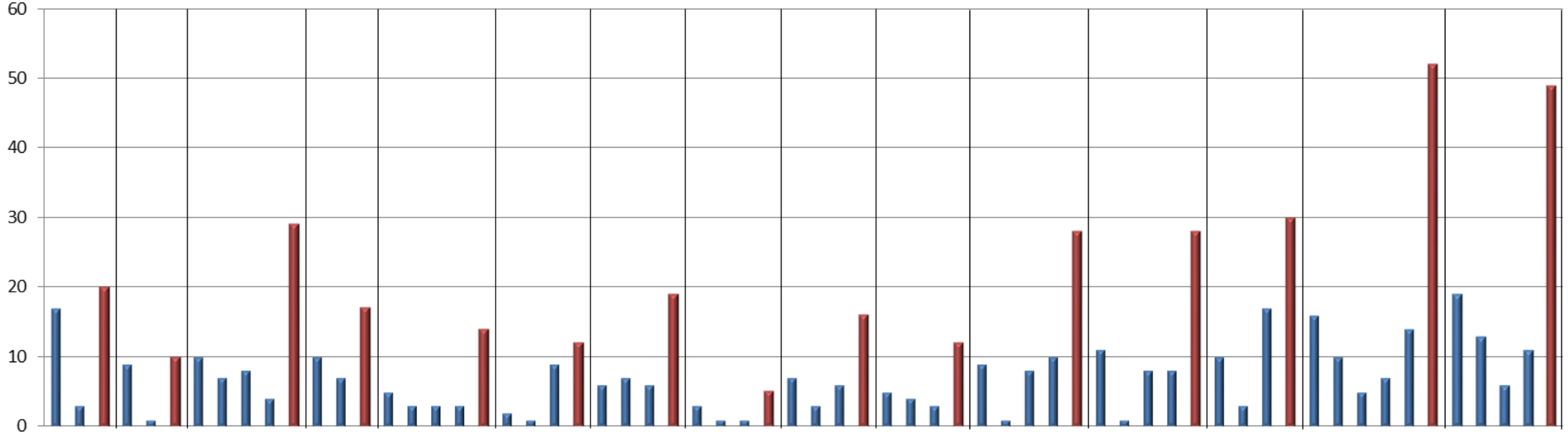









THE PAST ACTIVITIES OF THE COMMITTEE “A”



A	B	T	A	B	T	A1	A2	B1	B2	T	A1	A2	T	A1	A2	B1	B2	T	A	B	C	T	A	B	C	T	A	B	C	T	A	B	C	T	A	B	C	D	T	A	B	C	D	T	A	B	C	T	A	B	C	D	OT	T	A	B	C	OT	T
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17	3	20	9	1	10	10	7	8	4	29	10	7	17	5	3	3	3	14	2	1	9	12	6	7	6	19	3	1	1	5	7	3	6	16	5	4	3	12	9	1	8	10	28	11	1	8	8	28	10	3	17	30	16	10	5	7	14	52	19	13	6	11	49

Benchmark contributors status 1991 – 2019 per theme and date

THE PAST ACTIVITIES OF THE COMMITTEE “A”

16th Benchmark Workshop

Ljubljana, SLOVENIA

5th – 6th April, 2022

Themes and participants

Theme A: Behavior prediction of a concrete arch dam

Theme B: Evaluation and prediction of the behavior of the Beauharnois

Theme C: Behavior of a Slovenian embankment dam

32 solutions proposed by the participants

Open themes: 3 presentations

ACTIVITIES IN PROGRESS

New Bulletin completed

“Non Linear Modelling of Concrete Dams”

- ✓Provide guidance for the application of non-linear analysis techniques for the design and evaluation of concrete hydraulic structures.
- ✓Examine procedures that show how to take into account the non-linear behavior of constituent materials.
- ✓Examine procedures for the analysis of transient processes (e.g. seismic response, settlements, thermal effects, creep and shrinkage, freeze-thaw effects, alkali-silicate-reaction and leaching).

ACTIVITIES IN PROGRESS

New Bulletins under preparation

“Capitalization of results of the Benchmark Workshops”

✓Prepare a synthesis of the results of the BWs held so far.

✓Make a critical assessment of the methodologies applied and lessons learned.

✓Define methodological references in the field of numerical modelling.

✓Prepare recommendations to be applied in the numerical modelling process.

❑ The Bulletin is divided into two parts, one dedicated to concrete dams and one to earth dams

ACTIVITIES IN PROGRESS

Joint activities with other ICOLD Technical Committees the aim to facilitate the integration of complementary knowledge:

✓Organization of a joint workshop in Marseille during the 90th Annual Meeting of ICOLD (after Ottawa 2019) with the **Committee on Concrete for Dams** and preparation of a joint Bulletin on "**Arch Dams Design Methodologies and Criteria**.

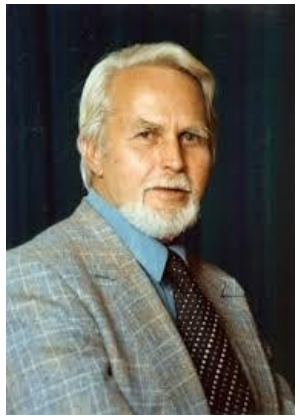
ACTIVITIES IN PROGRESS

Organization of the **17th Benchmark Workshop**

✓**Proposal of the Bulgarian Committee to host the BW in Sofia** *2023, date to be defined*

CONCLUDING REMARKS

The ICOLD Committee A "Computational Aspects of Analysis and Design of Dams" has strongly contributed to **create a bridge between specialists of numerical modelling and dam engineers** and to the diffusion of knowledge in the field of numerical modelling.



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Non Linear Modelling of Concrete Dams

Committee A

Computational aspects of analysis and design of dams

THANKS FOR YOUR ATTENTION