

IAHR Hydraulic Structures Section NEWSLETTER



Pedrogão dam (Portugal)
A RCC gravity dam (H = 43 m, L = 473 m)
with uncontrolled stepped spillway



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The objectives that were established by the Hydraulic Structures Section when it was founded one decade ago, maintain a particular relevance today, in line with the mission of IAHR, namely:

- to champion the area of hydraulic structures in an era of increasing specialization;
- to provide a solid knowledge and experience base for design of hydraulic structures;
- to bridge the gap between researchers and practitioners;
- to identify knowledge gaps where hydraulic research can be applied;
- to address the subtle changes in the use of hydraulic structures to manage water in an environmentally sound manner;
- to encourage continuing education in hydraulic structures through specialty conferences, workshops, short courses and educational curriculum;
- to collaborate with other organizations in the advancement and understanding of hydraulic structures in the natural environment.

During the last decade, the IAHR Hydraulic Structures Section (IAHR-HSS) has actively participated to the activities of the IAHR, including contributions to the IAHR biennial congresses and the organization of symposia, workshops and seminars on topics related to hydraulic structures.

The involvement of the IAHR-HSS was particularly relevant for the international symposia on Hydraulic Structures, which were quite successful, in terms of attendance, overall quality of the papers and respective oral presentations, dedication of the local organization and also due to the enriching and friendly environment. The first one was held in Teheran, Iran, in April 2004, where some 600 people attended the event with around 50 foreign delegates. The second one was held in Ciudad Guayana, Venezuela, in October 2006, in conjunction with the XXII IAHR Latin American Congress, where more than 650 people attended the events with around 100 foreign delegates. The next International Symposium in Hydraulic Structures, Nanjing, China, October 2008, to be held in conjunction with the 16th Congress of the Asia and Pacific Division of IAHR, will be an excellent platform to strengthen our links and to collaborate with IAHR-APD in promoting the sharing of information and expertise in the field of hydraulic structures. The International Symposium on Hydraulic Structures series is becoming an important activity of the IAHR-HSS.

The 2nd International Junior Researcher and Engineer Workshop on Hydraulic Structures in Pisa, Italy, is another event taking place during 2008, specially directed to young professionals and researchers.

The launch of this IAHR-HSS Newsletter will mark the intensifying activities of the section. As delineated by its editors Robert Janssen, Corrado Gisonni and Fabián Bombardelli, it will include five main sections, namely the *HSS Activities*, *Spotlight*, *Future Events*, *Past Events*,

and *Publications*. Contributions from both section and non-section members will be particularly welcome in the *Spotlight* section. This section will contain articles that shine a spotlight on recent developments or projects of interest in research, design, construction or operation of hydraulic structures.

We would like to thank all colleagues who have contributed to the IAHR Hydraulic Structures Section since its inception, in particular to its first Chairman Philip Burgi. Thanks are also due to the Editors of the HSS Newsletter for their enthusiasm and initiative in advancing with this project.

We look forward to strengthen the cooperation with you all in 2008, to foster active collaboration between researchers and practitioners, and to encourage the participation of young professionals working in the field of hydraulic structures or related areas of interest.

Jorge Matos and Hubert Chanson
HSS Executive Committee

SPOTLIGHT

Reflections on the 10th Anniversary of the Hydraulic Structures Section

By Philip Burgi, Founding Member and Past Chair of the HSS

The Hydraulic Structures Section is pleased to be celebrating its tenth anniversary in 2008. Renewed interest in hydraulic structures was expressed during the 1995 XXVI IAHR Congress in London when several IAHR members met to discuss the possibility of forming a new IAHR section on Hydraulic Structures. In 1997 at the XXVII IAHR Congress in San Francisco a group of over 30 members expressed interest in the formation of the new section and the council asked that the feasibility of forming an IAHR Hydraulic Structures Section be investigated. The new Hydraulic Structures Section was formerly approved by the IAHR Council at their July 1998 meeting and added to the Applied Hydraulics Division.

As we enter the 21st century we are aware that the engineering and research emphasis on hydraulic structures is changing with changes in public values. Subtle changes in the traditional water resources development emphasis of dams/spillways/outlets have occurred with a new engineering and research emphasis directed toward continued water development but with increased emphasis on environmental sustainability. The Section embraces the traditional use of hydraulic structures but with an addition focus on the role hydraulic structures play in improved water management practices, water quality, and restoration of natural habitat. The practice oriented nature of our work has drawn the attention of the global design community. The first organizational Section meeting was held in 1999 at the XXVIII IAHR Congress in Graz.

Since the very beginning, the members of the Section have actively participated and contributed to the biennial IAHR congresses. The number of hydraulic structure contributions at the biennial congresses has increased at every event. As well as participating in the biennial congresses, the Section has been actively involved in the organization of the following symposia and seminars:

- International Workshop on Hydraulics of Stepped Spillways - Zurich, Switzerland, March 22-24, 2000,
- Special Seminar on Key Hydraulic Issues of Huge Water Projects - Beijing, China, September 17-18, 2001,
- International Symposium on Hydraulic and Hydrological Aspects of Reliability and Safety Assessment of Hydraulic Structures - St Petersburg, Russia, May 29-June 2,

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Hydraulic Model of Guri Dam -
Ciudad Guayana, Venezuela
October, 2006

2002,

- International Workshop on Rock Scour due to High Velocity Jets - Lausanne, Switzerland, September 25-28, 2002,
- International Conference on Hydraulics of Dams and River Structures - Tehran, Iran, April 26-28, 2004,
- International Symposium on Hydraulic Structures (jointly with the XXII IAHR-LAD Congress) - Ciudad Guayana, Venezuela, October 12-14, 2006.

Following the idea and concept of the European Junior Scientist Workshops of the IWA/IAHR Joint Committee on Urban Drainage, the IAHR Hydraulic Structures Section held the first International Junior Researcher and Engineer Workshop on Hydraulic Structures in Montemor-o-Novo, Portugal September 2-4, 2006. The main themes of the workshop embraced the hydraulics of dams and hydropower schemes, river structures, hydraulic structures in urban drainage and sewer systems, as well as coastal protection systems. A half-day technical tour included the visit to some relevant hydraulic schemes in Alentejo region, namely the Alqueva and Pedrógão dams on the Guadiana River.

The workshops provide an opportunity for young researchers and engineers to present ideas, plans, and preliminary results of their own research in an inspiring, friendly, co-operative, and non-competitive environment. The events are small in size and normally include less than fifty students and possibly up to ten experts from consultancy and research in hydraulic engineering with the aim to stimulate the debate during the presentations, as well as during the subsequent round table discussion.



Hydraulic Structures Section Meeting - Venice Italy July 1, 2007

One might ask what future activities are planned by the Hydraulic Structures Section. Here are some of the plans.

Biennial Congress participation:

We will organize topical sessions dealing with hydraulic structures at the upcoming congresses:

- XXXIII IAHR Congress - Vancouver BC, Canada, August 9-14, 2009
<http://www.iahr2009.org>
- XXXIV IAHR Congress - Brisbane, Australia, 2011

Hydraulic Structures Symposia and Seminars:

- 3rd International Symposium on Hydraulic Structures, held in conjunction with the 16th IAHR-APD Congress - Nanjing, China, October 20-23, 2008
<http://apd-iahr2008.hhu.edu.cn/>
- 4th International Symposium on Hydraulic Structures - Gaborone, Botswana, 2010 (Proposed)

Junior Researcher and Engineer Workshops:

- 2nd International Junior Researcher and Engineer Workshop on Hydraulic Structures - Pisa, Italy, July 30 - August 1, 2008
<http://www2.ing.unipi.it/2nd-ijrewhs08/>

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HSS Email List

To request being added to the HSS email list, please send an email with the subject "HSS Subscribe" to:

Fabián Bombardelli

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- 3rd International Junior Researcher and Engineer Workshop on Hydraulic Structures - Stuttgart, Germany, 2010 (Proposed)

Updates on these and other events will be provided in future issues of *HSS News*.

Our future looks bright as we confront the global needs for clean water distribution, protection from floods and other natural disasters, continued development of hydroelectric as a clean alternative to fossil fuels, and maintenance and replacement of older structures in this new millennium. We are grateful for the visionary members that started the Section and we continue to regenerate Section membership to reflect the new realities we face and provide opportunities for the younger membership in IAHR.

FUTURE EVENTS

2nd International Junior Researcher and Engineer Workshop on Hydraulic Structures

University of Pisa, Italy: July 30 - August 1, 2008

<http://www2.ing.unipi.it/2nd-ijrewhs08/>

Contact: Stefano Pagliara s.pagliara@ing.unipi.it

16th Congress of Asia and Pacific Division of the IAHR 3rd IAHR International Symposium on Hydraulic Structures

Hohai University, Nanjing, China: October 20-23, 2008

<http://apd-iahr2008.hhu.edu.cn/>

PAST EVENTS

XXXII IAHR Congress

Venice, Italy: July 1-6, 2007

The traditional IAHR Congress was held in Venice, Italy, from July 1-6, 2007. The congress was a definite success, as demonstrated by the more than 1,000 delegates who attended the conference, the 900 papers submitted (737 of which were published in proceedings), the numerous exhibitors present in the event, the diversity of parallel sessions, and the quality of the presentations and discussions. Many prominent researchers of different parts of the world were able to attend the meeting. A detailed report on the congress can be found in the Newsletter of the IAHR, on page 72. In this report, the activities regarding the sessions on hydraulic structures are summarized.

The congress hosted 4 sessions on hydraulic structures and related topics, as follows: Special Session (SS) 01- Downstream environmental effects of reservoir operation; SS 04- Retrofitting existing dams with fish passes; C1.b- Localized hydraulic phenomena; C2.b- Hydraulic structures. Papers covered a wide range of topics, from observations of the flow in hydraulic jumps, dropshafts, and plunge pools, to the analysis of the time dependent behavior of the scour processes. From the above C sessions, it is possible to mention the number of papers accepted for oral presentation according to their topic: a) 9 papers on hydraulic jumps and stilling basins; b) 18 papers on scour; c) 9 papers on observations of turbulence in hydraulic structures. All sessions were well attended by engineers and researchers from all over the world, and most of them were chaired by the members of the Hydraulic Structures

Other Future Events

XXXIII IAHR Congress

Vancouver BC, Canada

August 9-14, 2009

<http://www.iahr2009.org>

XXXIV IAHR Congress

Brisbane, Australia

2011

Section.

Beside the oral presentations, an interesting poster session was also organized. With specific reference the Session C2.b (Hydraulic Structures), 28 posters were presented involving a wide field of interest: Energy-Dissipation Structures (6 papers), Dam Hydraulics (5 papers), River Structures (9 papers), Case Studies on Dam/River Engineering (8 papers).

It may be also mentioned that the conference took place close to arguably one of the most impressive ongoing hydraulic structures of the world: the Venice floating gate system (MoSE) to protect the lagoon from periodic flooding. A technical visit to this fascinating project took place on Thursday, July 5.

Finally, the congress also marked the formal handing over of the Journal of Hydraulic Research of the IAHR Editorship from Prof. Marcelo H. García (University of Illinois, USA) to a member of the Hydraulic Structures Section, Prof. Willi Hager (ETH Zurich, Switzerland).

PUBLICATIONS

"Tables for the Hydraulic Design of Pipes, Sewers and Channels"

Eighth Edition (2 volume set), H.R. Wallingford & D.H. Barr,

2006, Thomas Telford Ltd & ASCE, ISBN=9780727733856

<http://books.hrwallingford.co.uk/acatalog/drainagepage1.html>

http://www.thomastelford.com/books/bookshop_main.asp?ISBN=9780727733856

<http://www.asce.org/bookstore/book.cfm?book=6288>

Description from the publishing company:

For over 30 years, HR Wallingford's publication "Tables for the Hydraulic Design of Pipes, Sewers and Channels" has been an essential reference for civil engineers working in the field of hydraulics. Now, this updated eighth edition is available which enhances the usefulness of these Tables to the industry. For this new edition the system of increments of gradient have been modified to reduce the need for interpolation, now matching that of (Tables D). Continued from the Seventh edition are the results of new work on the assessment of roughness size in commercial pipes manufactured from materials currently utilized to give a smooth finish and on the assessment of additional losses at bends in such pipes. Volume 2 uses a newer, alternative, route to support the application of the unit size method. For this route, Manning equation tables (Tables D) act also as a carrier for obtaining solution of the Colebrook-White Equation when combined with (Tables E). For Volume 2 of the Seventh edition, the Manning equation tables were redone reducing the increment in gradient between entries to ease interpolation. This is continued here. As before the coverage of discharges continues into the order of scale of continental rivers. In Volume 2 a wide range of conduit and channel shapes is covered by tables of properties based on unit size, with key examples of these tables also included in Volume 1. This gives illustration of solutions supported by the established form of Colebrook-White tables, as is possible for most conduits and smaller channels when the two volumes are used in conjunction.

BOOK REVIEW - "Hydraulic Structures"

Fourth Edition, P. Novak, A.I.B. Moffat, C. Nalluri, R. Narayanan

2007, Taylor and Francis, ISBN 978-0-415-38626-5

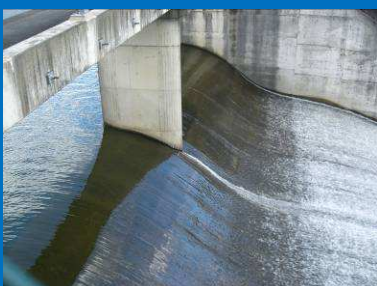
736 pages, paperback, \$ 61.99 / £ 35.00

The following review was published previously in the IAHR Journal of Hydraulic Research:

This is the fourth edition of the well known book from Professor Pavel Novak and his co-authors, among which we heartrendingly notice the name of Chandramouli Nalluri, who passed away on 14 December 2003 after having spent thirty years at the Department of Civil



Baroon Pocket Dam,
Queensland, Australia



Engineering of the University of Newcastle upon Tyne, UK.

The book keeps the architecture and the purposes of the previous edition, essentially addressing final year undergraduate and postgraduate students. Thanks to a substantial up-to-date reference source, the book may definitely be considered a helpful tool for practitioners as well as for lecturers. The first part of *Hydraulic Structures* focuses dam engineering (chapters 1 to 7) and was significantly enriched with additions on specific topics. These include environmental issues and guidelines from the "World Commission on Dams" report; partially saturated soils and related issues for embankment dam engineering; protection and rehabilitation of embankment dams; RCC dams and improvement of masonry and concrete dams; stepped spillways; scour phenomena in plunge pools; operation and control of gates with a particular attention to cavitation damage and vibration; risk assessment and emergency planning due to dam failure.

The second part of the book (chapters 8 to 16) presents general topics ranging from river to coastal engineering, passing through hydro-mechanical structures (hydro-power plants and pumping stations). The last chapter deals with hydraulic models and offers a concise presentation of computational and physical modelling. The major enhancement of this work involves the development of small hydro-power; wave-structure interaction and pipeline stability; and recent references on computational fluid dynamics. The book's key topics are illustrated along with worked numerical examples that guide readers through the application of design criteria. The standard of illustrations and figures is rather high and the text is clear, offering an excellent presentation of the most common hydraulic structures.

In summary, this book is a natural enhancement of the previous successful edition. It will definitely add to the current literature, with significant advantage for students and professional in the field of hydraulic engineering.

Prof. Dr. Corrado Gisonni, II Università di Napoli, Italy

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Quick Links

IAHR Home

Home page of the IAHR

<http://www.iahr.net>

IAHR Media Library

Electronic material relating to hydraulics, hydrology and water resources

<http://www.iahrmedialibrary.net>

FINAL NOTES

Looking for future articles for SPOTLIGHT

The *SPOTLIGHT* section is intended to be the focus of this newsletter. In this first edition, we have been privileged to have received an excellent overview article by Philip Burgi, founding member and past Chair of the HSS. For future editions, we are keen to receive contributions that shine a spotlight on recent developments or projects of interest in research, design, construction or operation of hydraulic structures. Please contact the editors listed below should you have ideas for suitable articles, or should you be willing to submit an article.

HSS Email List

The HSS Committee has recently started assembling an email list for those interested in receiving future editions of this newsletter, and other communications of interest related to hydraulic structures. In the interest of avoiding excessive emails, the communications issued to this planned list will be controlled by the HSS Committee. If you are interested in being on the mailing list, please send an email with the subject "HSS Subscribe" to Fabián Bombardelli: fabombardelli@ucdavis.edu

Feedback

We welcome any feedback that readers may have regarding the first edition of this newsletter. Please contact any of the editors below should you have any suggestions or comments.

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