

Newsletter

October 2017

Chair's Message

'Engineering New Zealand' and the creation of NZSOLD's new website

<http://nzsold.org.nz/>

On the 1st October, our parent body launches its new brand Engineering New Zealand. The team at (previously) IPENZ have been working for several years to better deliver what members want, and have undergone a huge amount of internal transformation. Full credit to them for the ongoing hard work to produce this change. If you are a member, you will have received information about the changes to the membership structure and the creation of a more inclusive membership pathway to enable Engineering New Zealand to be the professional home for a wide range of engineers from all disciplines and at all career stages. Technical groups such as NZSOLD, with the expertise and credibility our members bring, remain a core part of the strategy. This includes working together to strengthen engineering's profile, by providing expert comment to the Government and the public.

As part of the change, Engineering New Zealand have launched their new website and so have NZSOLD. While there will still be a link to NZSOLD from their site, we now have our own domain name, which should make it much easier for anyone searching to find us. Make sure you take a look! Thank you to David Bouma for his ongoing commitment to developing our web presence.

Symposium and Workshop

Our 2017 Symposium and Workshop "Performance of Structures and Organisational Systems During Emergency Events" held in Wellington on 20 & 21 September was a huge success. Thank you to all our presenters for sharing their knowledge and experience, and to all the attendees for participating in engaging workshop sessions. The Event Report in this newsletter provides some insight into the discussions of the 2 days. Thanks also to our sponsors and the organising committee for making the 2 days possible.

Formal recognition of Derek Wilshere, long-standing NZSOLD Secretary

At the conclusion of our Symposium, we formally thanked and farewelled Derek Wilshere, our long-standing NZSOLD Secretary. Derek has served the NZSOLD committee for some 22 years. He has seen the society through a number of phases and passed on his knowledge to multiple incoming committees. His service has been, and is, greatly appreciated. Thank you to Tony Pickford for formally recounting many of Derek's contributions during his time with the committee.



NES Dam Safety - consultation delayed

In early August we circulated the notice from MfE that Cabinet agreement to release the proposed *National Environmental Standard for Dam Safety: Consultation Document* would now be sought after the election. This means the consultation stage will take place in December at the earliest. We will let you know as soon as we hear anything further.

ANCOLD Conference Hobart 25th-27th Oct

We look forward to seeing any of you who are attending the ANCOLD Conference in Hobart in the week 25-27th October. It's always good to get together and share learnings with our neighbours across the Tasman.

Kind regards

Rebecca Knott

Chair

Young Professionals Group Update

It was pleasing to have 24 Young Professionals attend the Symposium and Workshop in Wellington in September. Back by popular request, the Young Professionals hosted the Dam Pub Quiz at the end of the symposium. Many thanks to Andrew Balme and Matt Henden for hosting symposium attendees for an entertaining evening of dam trivia.



Following the success of our previous Auckland and Canterbury field trips, the YP group are eager to organise the next field trip. Please contact Dan (email address below) if you would be interested in hosting/organising an event, or if you would simply like to join the YP Group and keep up to date with news and events.

After two years as the YP Group Chair, establishing the group in 2015 and nurturing it to over 60 members, Dan Forster is looking to step aside for someone with new energy and enthusiasm to lead the Young Professionals Group through the next step change in growth. Dan and the NZSOLD Management Committee are on the lookout for someone with strong leadership and time and energy to commit to the group. If you know someone suitable please contact Dan.

Dan Forster

Young Professionals Group Chair

dan.forster@damsafety.co.nz

Event Report - NZSOLD Symposium and workshop – Performance of Structures and Organisational Systems During Emergency Events - September 20 and 21 2017, Wellington



- Learn from the past
- Analyse and prepare for the future (eyes open, not head in the sand)
- Have a plan, practice the plan
- Events last longer than you think and it takes a lot of people to manage them
- Communicate, educate and build relationships
- Follow the plan - and remember it's all about the people.

He aha te mea nui o te ao

What is the most important thing in the world?

He tangata, he tangata, he tangata

It is the people, it is the people, it is the people

Maori proverb

These were some key learnings from our Symposium and Workshop on “Performance of Structures and Organisational Systems During Emergency Events”.

Summary notes of the 2 days are below:

Keynote presentations from Jon (Mitch) Mitchell, Programme Manager for the Alpine Fault 8 Project, and Anwen Hall, Digital Advisor for Trustpower, set the scene for 2 days of fascinating learning and exchange of experience. The Alpine Fault 8 Project aims to understand the consequences of a large Alpine Fault earthquake across the South Island. With a 300 year average rupture return period, the impacts of such a large event are frightening to consider, but it is reassuring to know that there are teams working so that we can be better prepared as a nation for large scale, foreseeable emergency events.

Anwen expanded the vocabulary of many of us, using terms like “stalking”, “trolls”, “ghosts” in new ways while describing the “monitoring of digital channels” that played a part in the interface between Trustpower, the media and communications with local communities during the Rangitaiki Floods in April this year.

In the following session, *Management of actual emergency events and lessons learnt*, we heard from Wellington City Council on learnings from the recovery after the Kaikoura earthquake of November 2016; from Trustpower on performance of the Matahina dam during the Rangitaiki Floods; Tonkin and Taylor on managing a potential dam failure event at the Aniwhenua headpond and from Peter Mulvihill on current flood control mechanisms in NZ. Actions by dam owners are critiqued post-event - stick to your procedures. Having 2 events in succession is not as rare as we would like it to be. Calm leadership is critical. It is vital to have well trained site inspectors, to raise the alarm when changed conditions are observed.

We gained insights into responsibilities and development of emergency and evacuation plans from the perspectives of Palmerston North City Council, Meridian Energy, large irrigation ponds in Canterbury and the Wellington Region Emergency Management Office (WREMO). Technical planning and human team behavioural understanding are both required to successfully manage emergencies and the stressful environment that accompanies them. Events last longer than you would like and it takes a lot of people to sustain a response. Who should be involved in the preparation, maintenance, implementation and education around evacuation plans is an evolving area.

The final Symposium session on *Design and performance of dams during unusual and extreme events* reinforced the importance of redundancy, diversity and failsafe gate operations drawing on the near-overtopping experience at Whakamaru Dam during the 1988 Cyclone Bola. Jo Grilli painted a great picture of both that event and the impact on Matahina dam and the surrounding area from the 1987 Edgecumbe earthquake. Just getting to the site can be problematic. Engineering Geology presented a comparison of the performance of earthfill embankment dams at the top of the South Island during the Mag 6.6 Aug 2013 Grassmere earthquake and the Mag 7.8 Nov 2016 Kaikoura earthquake. Lower damage than expected was observed from the Kaikoura earthquake - likely a result of the rolling motion experienced, compared with the high impact ‘jolt’ of the smaller quake. Riley Consultants closed out the day with a focus on the role and performance of flood detention dams - often forgotten about as they are empty more often than not, but they can still pose significant hazard. The question was raised: do we need to consider expanding the NZ Dam Safety Guidelines to include flood detention dams and stopbanks? It was noted that ICOLD have recently convened a committee on ‘levees’.

With that, the day wrapped up with an excellent dam quizz from the Young Professionals over some drinks and food.

The Day 2 Workshop had break out sessions interspersed with presentations. Marion Schoenfield and Shaun McCracken from Environment Canterbury opened the day with a keynote presentation sharing lessons from the landslide dams formed by the Kaikoura earthquake. Communication is key. Keep it simple and clear, repeat key messages, ensure ‘so what?’ is understood. Empathy first - if people feel heard they will trust the message better. Face to face communication is always the best. The challenge of warning the public while risk is uncertain.

We heard from Marlborough District Council about the challenge of earthquakes & aftershocks combined with heavy rain, floods, media and an owner with a lawyer at an already damaged dam.

NZSOLD presented on Module 6 Emergency Preparedness of the New Zealand Dam Safety Guidelines, placing it in the context of the overarching dam safety Objectives and Principles - understand the consequences of failure, identify all hazards and potential failure modes, take all reasonable efforts to prevent accidental releases, incidents, failures; have effective emergency preparedness and response procedures in place. Consider the total system surrounding the dam - human and organisational - not just technical. Early detection allows intervention. And a reminder that the owner is responsible for ensuring that people, property and the environment are protected from dam failure or uncontrolled release of the reservoir.

The Joint Centre for Disaster Research discussed the challenge of preparing a community for an event they have never experienced. There has been considerable research over the last 2 decades on warning systems for hazardous events and ways of delivering effective warnings to at risk communities. It is better to warn than not, when to warn, how to warn, the combination of warnings and social and environmental clues that is most likely to generate a response, use of alert levels to prime communities for an event that is unfolding - and the Q: are we giving our citizens the time they need to prepare and evacuate?

Our expert panel closed out the day commenting on the perspectives generated from the workshop break out sessions and addressing outstanding questions. It was recognised that there is real benefit in breaking down silos and cooperating - and that the Symposium and Workshop had been very positive for this, involving a range of stakeholders, roles and perspectives. Communication and relationships are #1 - "friends communicate a lot better than strangers."

The perspectives collected from the workshop sessions are being summarised and will be made available.

Thanks to everyone for a really enjoyable, informative and educational couple of days.

Rebecca Knott

Chair

ICOLD News and Event Report - 85th annual ICOLD meeting - 1-7 July 2018, Vienna, Austria.

The 85th Annual Meeting of the International Commission on Large Dams (ICOLD) was hosted by the Czech National Committee on Large Dams. It was held in Prague, the capital city of the Czech Republic, from 3-7 July 2017. There were close to 1,200 registrants. Five people from New Zealand attended. These included four people who are members of different ICOLD technical committees. The Annual Meeting comprised a one-day symposium on "Knowledge Based Dam Engineering", one day of meetings of various technical committees, one and a half days of workshops on different topics and a one-day technical tour. On one day, the General Assembly met. This is a meeting of representatives from member countries that covers governance, administrative, management, financial and planning matters associated with ICOLD. The symposium comprised nine different themes. A total of 302 papers from 43 countries were published in the proceedings. 76 papers were selected for oral presentations and 188 offered poster presentation. The papers covered a wide range of topics.

An important part of ICOLD is the production of Technical Bulletins that provide guidance on various topics of interest to the dam industry. ICOLD currently has 23 different technical committees. New Zealand currently has members on four committees and has been invited to provide a member on the newly established committee on levees and flood control structures. The terms of reference for each committee are agreed and approved by the ICOLD General Assembly and are available to review on the ICOLD website. Some committees have a single focus and a limited life while others have been in existence for many years and the terms of reference change in response to needs. The technical committees met for one day during the 85th Annual Meeting. Typically, some members provide presentations on recent work or research interests from their country, but most of the time is devoted to discussing work activities associated with their current terms of reference. Reports from the New Zealand representatives on various ICOLD committees follow.

1. Committee B: Seismic Aspects of Dam Design

Trevor Matuschka has just been appointed to the Seismic Committee. This committee was formed in 1968 and will celebrate its 50th anniversary in 2018. The committee has produced several Bulletins over the years. It has different areas of interest that are reflected in the current terms of reference (TOR).

Work is being progressed on the current TOR by different members of the committee. This includes work on dynamic concrete strength properties of an RCC dam (China), seismic design aspects of CFRD dams, dams with asphaltic cores and dams with other types of liners and internal membranes (working group from Norway, Colombia and Japan), review of nonlinear seismic analysis procedures for concrete and embankment dams (Colombia and Austria), preparation of a document on the nonlinear dynamic analysis of embankment dams (USA), interpretation of seismic data obtained from dams (Japan and USA) and dissemination of information on seismic aspects of dams (Switzerland). The intention is for the seismic committee to produce a bulletin on the nonlinear dynamic analysis of embankment dams and a bulletin on the nonlinear static and dynamic analysis of concrete dams in conjunction with the Computational Committee. Outstanding issues to be progressed include the seismic safety of existing dams, damping characteristics of concrete dams and the effects of aftershocks on dams.

A presentation was made to the committee by Trevor on the effects of the Nov 2016 M7.8 Kaikoura earthquake on dams in New Zealand. Presentations were also made by Japan on the effects on dams by the April 2016 Kumamoto M7.3 earthquake and by Canada on seismic work being carried out by BC Hydro.

2. Committee G: Environment

NZSOLD has been a member of the Environment Committee for many years. Peter Amos is the current NZSOLD representative. This committee has been hampered at times by challenging leadership, but is now entering a phase with new energetic leadership and a mandate to deliver a Bulletin titled "Integrating Dams with the Environment".

The Bulletin will be a compilation of case studies from around the world. The intention is to follow the environmental steps in development i.e. impact assessment, implementation of mitigation, and monitoring of effectiveness of measures. A topic that New Zealand will be contributing is in the field of environmental mitigation for run-of-river, peaking power plants and pump storage hydropower schemes. Other case studies being considered include transboundary rivers. Another case study we are keen to include would be follow up review of the success of environmental mitigation 20-40 years after project development.

If you have a good case study worth recommending for the Bulletin please contact Peter Amos; peter.amos@damwatch.co.nz

3. Committee I: Public Safety Around Dams

Peter Lilley has been the NZSOLD representative on this committee for several years. The annual meeting of the Public Safety committee focused on progressing the outline for the formal bulletin. A significant number of changes in committee membership hampered progress, however a timeline was established for members to work toward agreed tasks.

It is intended to have a complete draft for the bulletin available for the committee to review and discuss at the 2018 ICOLD meeting in Vienna.

The status report, which has been the focus of effort for the last 3 years is largely complete and awaits final editing and formatting before being formally released. This report summarises the current state of practice around public safety across member countries.

4. Committee N: Public Awareness and Education

The New Zealand representative on this committee is Peter Mulvihill. Peter has served on this committee for several years and is the current chairman. A further update of the ICOLD website has been completed with the enhanced ability to download and operate the site on several digital mediums.

The proposal to produce a video based on the ICOLD “Dams and the Worlds Water” was discussed further. While the project was seen as a valuable contribution, the implementation of this proposal without a significant budget has proved problematic. It was agreed to defer the project until a suitable strategy for implementation has been found. It was suggested that sponsoring a competition to produce a short video under a set of defined objectives and criteria as part of an academic course of study may be an option. This option is being investigated.

ICOLD Central Office has a number of power point presentations including key messages. These resources can be used by National Committees and are available upon request.

A start has been made on an update to the 1999 ICOLD publication “Benefits and Concerns About Dams”. It was highlighted that there are a significant number of changes and additional issues that have arisen since 1999 including the statistics used and issues such as climate change. This will be progressed over the next year.

For further news, see ICOLD newsletter <http://www.icold-cigb.org/GB/news/newsletters.asp>

NZSOLD input to IPENZ Practice Note 2 - Peer Reviews

A working group from the NZSOLD Committee have been engaging with Laura Stockton of IPENZ who is drafting a new version of IPENZ Practice Note 2 - Peer Review. The new practice note will attempt to clarify the various different peer review roles that Members are asked to perform. This is a challenging task for IPENZ as there is a wide range of different peer review functions and roles across many engineering disciplines, and the terminology being used by the various organisations involved is sometimes contradictory.

Of particular concern to some NZSOLD Members is the difference between a technical peer review that is recommended by NZSOLD Guidelines for design work on Medium and High Potential Impact Category Dams, and what has been referred to as the Regulatory Review role that is commissioned by Building Consent Authorities to review Building Consent applications for dams. These are quite different functions.

The working group consists of David Bouma, Peter Lilley, Peter Mulvihill, Trevor Matuschka and Hugh Keane. Please contact one of us, or contact Laura at IPENZ directly if you would like to engage in this process.

Building consents for dams - achieving a consistent and efficient approach

There is a concern amongst some NZSOLD Members that the process of obtaining a Building Consent and associated Code Compliance Certificate for dam construction projects is sometimes not as efficient as it could be, and that there are apparent inconsistencies in the way these process are handled between different Building Consent Authorities and the technical advisors engaged by the BCA's.

The working group that provided input to the IPENZ Practice Note (see above) has held an initial meeting to discuss this issue. The intent of the working group is firstly to understand more clearly what the issues have been, and then work with the BCAs and their consultants towards tweaking the system to improve the consistency and efficiency of processing Building Consents and CCCs.

If you would like to provide input into this process, please contact David Bouma (dbouma@tonkin.co.nz).

Introducing New Committee Member - Dan Forster



Dan is a principal dam safety engineer with Dam Safety Intelligence in Wellington. He has worked with dams for 15 years including 8 years working for large hydro owners in NZ and Australia. At work Dan has expertise in dam safety programmes and management systems, dam safety reviews, surveillance, emergency preparedness and training. He has also worked on a number of major dam rehabilitations. In his spare time Dan is a keen mountain biker and leads a group of volunteers that develops and maintains mountain bike trails in the Wellington hills.

Dan has been an active member of NZSOLD for a number of years prior to joining the Management Committee. Dan was part of the team that wrote the 2015 New Zealand Dam Safety Guidelines. He also co-initiated the NZSOLD Young Dam Professionals Group in 2015, which has been a great success and has added new diversity to NZSOLD's membership and events. Now on the Management Committee, Dan is leading the Symposium and Education sub-committee and has officially been initiated to the role by organising the 2017 Symposium and Workshop on Emergency Preparedness. Dan looks forward to continuing to contribute to the growth of NZSOLD with enthusiasm and energy.

Introducing New Committee Member - Matthew Shore



I am really pleased to have been elected onto the NZSOLD management committee, representing small to medium corporate members. This is my first time on the management committee, so it has been great the last 6 months getting an understanding of how things work. I have also enjoyed thinking about what we are looking to achieve as a committee over our term this last few months. I sit on several subcommittees, including Regulatory and Environment (for which I am the Convenor, which includes the dam safety scheme and RMA) and Education (I am currently part of the organising committee for the upcoming symposium and workshop). My key motives for being on the NZSOLD committee are to ensure NZSOLD evolves

to remain a relevant professional society (YPG's, media etc.), we continue to apply best practice in NZ and to ensure all the skills/experience in the industry which sits with senior staff, from some of our iconic dam projects, is transferred to younger members.

For my day job, I am a Principal Engineering Geologist - Dams & Hydropower, with Stantec (formerly MWH). I am a Chartered Professional Engineering Geologist (PEngGeol) and have 15 years dam engineering experience. Although based in Christchurch, I spend much of my time working on overseas projects. My role is primarily technical, working on both new dams and upgrades to existing dams, for a variety of uses (hydropower, irrigation, water supply and mining). My experience covers both concrete and embankment dams, with an emphasis on dam foundations, construction materials, abutment and reservoir shoreline stability and earthquake engineering. It is great to do a job which I enjoy and although it sounds a bit naff, it does feel like what we do makes a big difference (such as providing water or electricity for example). I particularly enjoy working in developing countries, where projects really do make a huge difference in people's lives, with recent or current projects in Fiji, Samoa, PNG, Solomon Islands and the Philippines.

Introducing New Committee Member - Hugh Keane



Hugh currently manages the Infrastructure Team at the Waikato Regional Council (WRC). The team's RMA responsibilities include the regulation of '3 Waters' activities, as well as the energy sector, including hydro dams. Hugh is also 'Team leader, Building Act, Large Dams', as WRC acts as the Building Consent Authority for all North Island Regional Councils. He is also currently a member of the working group assisting MBIE and MfE in the development of the National Environment Standard for Dam Safety.

Hugh began his professional career with the former Ministry of Works and Development in Rotorua, prior to spending several years working as a geologist in the Australasian and UK mineral exploration industries. He joined WRC in 1994. In 2008 Hugh undertook a family sabbatical in the UK, where he was employed as an environmental consultant with Scottish Water. Part of his work involved assessing Victorian-era reservoir structures for repair or removal.

Hugh has joined the NZSOLD Committee as a co-opted member and hopes his regulatory experience under both the RMA and the Building Act will assist the committee and provide a different perspective given the current legislative developments in dam safety in New Zealand.

Upcoming Events

DAM SAFETY TRAINING COURSE: 'UNLOCKING THE NZSOLD GUIDELINES'

18 & 19 October 2017, Wellington

For more information <http://damsafety.co.nz/home/dam-safety-training/>

4TH INTERNATIONAL CONFERENCE ON LONG-TERM BEHAVIOR AND ENVIRONMENTALLY FRIENDLY REHABILITATION TECHNOLOGIES OF DAMS (LTBD 2017)

17 to 19 October 2017 in Tehran, Iran.

ANCOLD CONFERENCE 2017 - GREAT EXPECTATIONS FOR NEW AND EXISTING DAMS - AGEING DAMS, NEW IDEAS

26-27 October 2017, Hobart, Australia

HEC-HMS AND HEC-RAS COURSE (RAINFALL-RUNOFF AND HYDRAULIC MODELLING)

6-9 Nov 2017, Auckland

Register at www.surfacewater.biz/auckland/
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SEVENTH INTERNATIONAL CONFERENCE AND EXHIBITION ON WATER RESOURCES AND RENEWABLE ENERGY DEVELOPMENT IN ASIA

13-15 March 2018, Danang, Vietnam (Organised by International Journal on Hydropower and Dams - see http://www.hydropower-dams.com/asia-2018-conference.php?c_id=303)

UNITED STATES SOCIETY ON DAMS, 2018 CONFERENCE AND EXHIBITION
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April 30 - May 4 2018, Miami, USA https://ussdams.wildapricot.org/event-2471270

ICOLD 26TH CONGRESS & 86TH ANNUAL MEETING
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1-7 July 2018, Vienna (Austria) http://www.icold-cigb.net/article/GB/news/events/26th-congress--86th-annual-meeting-1-7-july-2018-vienna-austria

Articles

Enabling Sustainable Growth: How the Opuha Dam improves sustainability in South Canterbury

The Opuha Dam project in New Zealand is described as being a great success story for the economic prosperity of the region, enabling the development of a robust agricultural sector covering a wide range of land use activities. Tony McCormick from Opuha Water gives an

insight into this scheme and explains how the issues of water shortages and quality are being addressed.

This article was published by International Water Power and Dam Construction in June 2017. Read the full article here:

<http://www.waterpowermagazine.com/features/featureenabling-sustainable-growth-5844537/>

Small dam, big task: Craig Scott from MWH gives an Engineer's personal reflections on managing an emergency dam decommissioning

This article was published by International Water Power and Dam Construction in July 2017. Read the full article here:

<http://viewer.zmags.com/publication/1258e2ad#/1258e2ad/30>

Interesting Links

The following links may be useful or interesting to members. We intend to add these to our website. Please let David Bouma know of any other links that you think may be useful to other members.

ICOLD	http://www.icold-cigb.net/GB/icold/icold.asp
British Dam Society	http://britishdams.org/default.asp
ANCOLD	https://www.ancold.org.au/
US Society on Dams	https://www.ussdams.org/
Hydroreview	http://www.hydroworld.com/index.html
Waterpower Magazine	http://www.waterpowermagazine.com/