

Newsletter - December 2018

Chair's Message

We are on the countdown to Christmas and, hopefully, a refreshing summer break for all of us.

The final quarter of 2018 has been busy for the NZSOLD Committee, including attending ANCOLD 2018 in Melbourne and starting preparations for next years combined conference with ANCOLD in Auckland. I want to thank everyone who has put in work so far to ensure we have venues sorted, a topic defined, sponsorship underway, a programme outlined, guest speakers lined up and our first call for abstracts out before Christmas. Our conference organiser, Cheryll, has done a great job keeping us all moving, which is no small feat with the pressures of day jobs mounting as the holidays close in. We hope many of you will submit abstracts and join us in Auckland for the conference next October - further information is included in this newsletter.

Dam Safety Regulations

The Technical Working Group on Dam Safety Regulations met on Friday 9 November 2018, for the first time since before the 2017 elections. Subject to decisions by the Government, we understand that a Proposed Regulatory Framework for Dam Safety will move back to the Building Act 2004. For those of you still following the process (it has been some 30 years since discussions first commenced, so you'd be forgiven if you've stopped), prior to the last election it was proposed that post-construction dam safety would sit under the Resource Management Act, as a National Environmental Standard. As Dam Safety provisions already exist in the Building Act, the move back should be relatively straightforward. MBIE has informed NZSOLD that a discussion document is planned for release next year, although we are told that final decisions on this will rest with relevant Ministers. I will keep you informed as more information comes to hand.

Dams are most likely to fail on first filling, when they are first exposed to reservoir loads. However, international studies show that there remains an equal likelihood of failure at any stage in a dam's life, due to slow developing defects, natural hazard events or human factors. Dam safety management systems aim to detect any developing failures in time to intervene before a catastrophic release of the reservoir contents occurs.

The greatest risks occur when dam owners:

- a) are unaware of the risk their structure(s) pose; and/or
- b) do not have appropriate dam safety management practices to ensure ongoing safe performance, maintenance and intervention if required.

We know that there are a portion of medium and high potential impact dams in New Zealand that fall into one (or both) of these two categories. As NZSOLD's aim is *"to protect people, property and the environment, present and future, from the harmful effects of a dam failure or an uncontrolled release of the reservoir contents"*, we (generally) support moving dam safety regulations into effect, to reduce exposure of our people, country and assets to risks posed by poorly managed dams. With less than 2 years until the next election, it will be interesting to see how much progress is made. NZSOLD will continue to work with government officials and Engineering New Zealand during this process.

Dam Safety Guidelines

We are collecting feedback on the 2015 NZ Dam Safety Guidelines, with a view to possibly updating some modules in 2019 to address feedback/issues identified to date. Please send any comments you have to nzsoldcommittee@gmail.com.

Engineering NZ new premises

It was a pleasure to join Engineering New Zealand on the eve of the Spring Forum to celebrate the opening of their new office space. It is a modern and fresh look for Engineering New Zealand, with spaces that lend themselves more readily to hosting industry events, small group meetings and general catch ups. If you're in Wellington, feel free to pop in at Level 6 NEC House, 40 Taranaki Street, Wellington Central. If you need a space to work in for a few hours in Wellington, just call ahead to make sure there's a quiet spot available for you.

NZSOLD AGM

Our AGM will be held at Engineering New Zealand on Thursday, 21 February. We hope many of you can join us, including for lunch prior to the meeting.

Kind regards,

Rebecca Knott - Chair



NZSOLD ANCOLD Combined Conference 2019

Resilient Dams for Resilient Communities

Hosted by New Zealand Society on Large Dams and Australian National Committee on Large Dams.

We're pleased to announce the 2019 NZSOLD ANCOLD Combined Conference - our 3-yearly New Zealand-Australia combined event. Join us next year in the City of Sails Auckland New Zealand from 9 - 12 October 2019 for a Pre-Conference Workshop, Conference & Post Conference Tour. Visit our website for news and updates regarding the conference. Be sure to check out this video to see what's instore for you.

Through the course of the conference and the social programme, we are sure you'll make the most of the opportunities to catch up with familiar faces and make new contacts. Our trans-Tasman relationship is highly valued and we can all benefit from the information sharing, debate and development of practice that our combined events foster.

The conference theme: Resilient Dams for Resilient Communities, encourages us to review our current state of practice, share best practice and explore present and future challenges that we must work collaboratively to address the impacts of natural disasters, climate change and population growth on infrastructure and communities.

We have the following International and Local keynote speakers confirmed for the conference & workshop:

Conference Keynote Speakers:



Mike Rogers
Stantec/ICOLD President



Elena Sossenkina
HDR/ICOLD Committee on Levees



Kelvin Berryman
GNS Science
General Manager

Workshop Keynote Speaker:



Leilo Mejia - Senior Principal Geosyntec Consultants

Full details of the speakers will be available from [our website](#) soon.

The Call for Papers is now open! Get the full details on the abstract submission process from our [conference website](#).

Be heard and share with us your experience and research by submitting an Abstract & Paper on the following themes:

Dams for Resilient Communities themes:

1. The role of dams and levees in creating resilient communities
2. Operation of dams and levees to protect communities
3. Emergency preparedness to ensure resilient communities
4. Environmental and social benefits and impacts

Resilient Dam and levee themes:

1. Design and safety issues for dam resilience
2. Design and safety issues for levee resilience
3. Operation for resilience
4. Construction for resilience

[Submit Abstract!](#)

There are options for papers, posters and lightning presentations. Each accepted submission will have the opportunity to present to the delegates. Click to view the full [NZSOLD ANCOLD Paper Submission Guidelines](#).

We look forward to your participation and submission of papers.

See you in Auckland in 2019!

Young Professionals Group

The YPG is pleased to host the third YPG Field Trip, this time in the capital Wellington! The Wellington Field Trip will be a “Historic Dams” tour, visiting some of the first dams built in the region now owned and operated by Greater Wellington Regional Council. The dams include the two oldest concrete gravity dams in New Zealand, Woollen Mills Dam and Korokoro Dam, built in 1903 in Korokoro, near Petone; and the Birchville Dam, a concrete arch dam built in 1930 in Upper Hutt. We will hear from Greater Wellington (GWRC) and Dam Safety Intelligence (DSI) representatives on the history of the dams, and some of the modern challenges of owning these dams and the upgrade works required to strengthen them. The tour will be capped off in the afternoon with a visit to the nearby Boneface Brewery in Upper Hutt to experience the next level craft beer and really good food. The bus will leave the brewery later in the afternoon to drop people in Wellington City at the Meridian Office and the airport.

Upcoming Events

Seminar: Static and Seismic Performance of Geosynthetics in Civil Engineering - Professor Tim Stark, University of Illinois

Auckland, 18 February 2019

Australasian Chapter of International Geosynthetics Society (ACIGS)

[Read more and register here.](#)

Young Professionals Group, Wellington Field Trip

Wellington, 8 March 2019

[Read more here.](#)

Africa 2019: Water Storage and Hydropower Development for Africa

Windhoek, Namibia, 2-4 April 2019

International Journal on Hydropower and Dams in partnership with ICOLD.

World Hydropower Congress

Paris, 14-16 May 2019

International Hydropower Association

[Read more here.](#)

ICOLD 87th Annual Meeting

Ottawa, Canada, 8-14 June 2019

The Canadian Dam Association is honoured to be hosting the International Commission on Large Dams' 2019 Annual Meeting in our nation's capital Ottawa.

Theme: Sustainable and Safe Dams around the World

[Read more here.](#)



NZSOLD ANCOLD Combined Conference 2019

Auckland, 9-11 October 2019



Read more on our [conference website](#).

Poster Competition 2019

The New Zealand Society on Large Dams (NZSOLD) would like to encourage the sharing of technical knowledge, experience, and research in fields related to our understanding of dams in New Zealand.

The 2018/19 NZSOLD poster competition is open to all New Zealand-based students and Young Professionals (under 40) who wish to share their work concerning the engineering, operation, management, safety, environment, biology or geology of dams (or water-retaining embankments).

Posters will be featured on the NZSOLD website and awards presented at the YPG event in Wellington on 8 March 2019. Posters will be displayed at the combined NZSOLD/ANCOLD conference in October 2019.

You can read more about judging criteria, entry requirements and prizes using the link below:

[View the poster competition flier here.](#)

Event Report

ANCOLD 2018 Melbourne: Dams – Evolving with Modern Technology

10 October Pre-Conference Workshop: Geotechnical Investigations of Dams, their Foundations and Appurtenant Structures

This year's ANCOLD conference was very well attended, with 32 NZ attendees out of a total ~340 attendees.

The pre-conference workshop *Geotechnical Investigations of Dams, their Foundations and Appurtenant Structures* was popular, and while more lecture style than workshop, it enabled a large amount of information to be presented in the one day. Robin Fell's comment "not a day goes by where I don't learn something" resounded with many - and this is what keeps our profession stimulating.

Keynote addresses at the main conference included John France on "*The 2017 Oroville Dam Spillway Incident - what happened and what we should learn*"; Des Hartford, BC Hydro on "*Unusual Combinations of 'Usual Conditions' - the possibility of the improbable!*" and Carla Liedtke from Control Risks on "*Cyber Security for Critical Infrastructure*". All were well received, relevant topics delivered by excellent speakers.

As always, it was great catching up with our Australian colleagues and hearing the latest from both sides of the Tasman and further abroad.

ICOLD News

The President of ICOLD, Michael Rogers will be attending our 2019 conference and giving a keynote address.

News from the ICOLD Technical Committees:

Committee T: Prospective and new challenges for Dams and Reservoirs in the 21st century (2017-20) (ad hoc committee)

This committee needs your help to identify unusual dams and reservoirs

NZSOLD member Craig Scott is nominated to the The International Commission on Large Dams (ICOLD) committee 'T'. ICOLD Committee 'T' is focused on the 'Emerging Challenges and Solutions in the 21st CENTURY' and is proposing to prepare a Bulletin with series of technical briefs regarding innovative 'unusual dams or reservoirs'. Craig Scott would like to know if NZSOLD members can contribute and support production of case studies for each of the structures being investigated. Do you know a case study project either in planning or constructed that you believe 'meets' the structure types below and that you are happy to assist with preparation of a short case study note?

The Bulletin will cover a general overview on the peculiarities of specific dam or reservoir types including:

- Reservoirs supporting solar and wind production
- Reservoirs at sea (Dams at sea for energy production and coastal protection (including large gates at sea))
- Dry reservoirs for flood mitigation
- Underground artificial reservoirs
- Off-stream reservoirs
- Reservoirs to foster biodiversity
- Dams with empty reservoirs for flood mitigation
- Dams for sediment retention
- Demodulation dams
- Diversion dams
- Barrages

If you are able to help identify potential case studies to help inform the technical notes, then please contact Craig at craig.scott@stantec.com. Depending on your structure case study 'type' Craig may introduce you to other members of the committee as each member is focusing on particular reservoirs or dams from the list. Craig is leading the Reservoirs supporting solar and wind production, and Reservoirs to foster biodiversity assessment. Any assistance will be recognized appropriately in the final documents produced.

There is no particular news from the following sub-committees that we are represented on:

Committee B: Seismic Aspects of Dam Design - Trevor Matuschka

Committee G: Environment - Peter Amos

Committee I: Public Safety around Dams - Peter Lilley

Committee N: Public Awareness and Education - Peter Mulvihill

Committee LE: Levees - David Bouma

The vice-chair of this committee will be giving a keynote address at the October joint ANCOLD / NZSOLD conference in Auckland in October.

For further news, see [ICOLD newsletters](#).

Articles:

Kochav HaYarden 344MW Pump Storage Hydropower Construction, Israel

By Craig Scott, Stantec, craig.scott@stantec.com

Scotland based NZSOLD member Craig Scott is the Lenders Engineer for the USD\$500M, 344MW Kochav HaYarden pump storage project now under construction in Israel. The scheme is being developed by Star Pumped Storage Ltd with the scheme named after the Kochav HaYarden national park located just north of Beit She'anvery near the Sea of Galilee and within the Jordon Valley.

Kochav HaYarden or "Star of the Jordan" is a beautiful national park formed around the famous 'Belvoir' Crusader fortress in Northern Israel 20 kilometres South of the Sea of Galilee. The area has a spectacular panorama which gave the Crusader fortress its name Belvoir meaning 'beautiful view'. The Crusaders built the fortress in around 1140, during the reign of Fulk d'Anjou (1131-1142), and in 1168 the Hospitaller Knights bought the land and made it into one of the most important fortresses in the country overlooking the Jordan Valley and the road from the Tabor Stream to the coastal plain and the Via Maris (the Way of the Sea). The Hebrew name, Kochav Hayarden also preserves the name of Kochava a local village which existed nearby during the Roman and Byzantine periods.

The Kochav HaYarden scheme will be the second pumped storage hydropower project in the country (the first, Gilboa at 300MW was recently completed and is under commissioning) which when operational will become integral to the operation of the expanding Israel electricity network. Craig Scott is also the independent engineer for the investors on the third 220MW pump storage project called Manara which is due for construction commencement in 2019.

The Kochav HaYarden scheme now 1.5 years into a 4.5 year construction period is being constructed by a joint venture of Sino Hydro of China for the civil works and GE of France for the mechanical and electrical works. The project comprises approximately 6km of tunnels works, an underground powerhouse cavern and separate transformer cavern, a near 550m vertical penstock pressure shaft and most importantly two 3 million cubic metre PVC lined embankment dam ponds to be constructed in a clay based geological formation and as such quite complex. An English version of an early construction project promotional YouTube video can be seen at the following link and this describes very well the project: <https://www.youtube.com/watch?v=gvTBQgjV6nE>.

Israel like New Zealand has a large agriculture and horticulture industry. Driving through the country there are countless large irrigation ponds similar in scale to those on New Zealand's flat and productive plains. As a result of this similarity Irrigation New Zealand has had close connection to the Israeli irrigation equivalent society including tours to the country several years ago. Unlike New Zealand, Israel does not have any large dams for water supply (they use desalinated water) or hydropower, as such there has been no development of a society similar to NZSOLD or connected to ICOLD.

If you are planning to trip to the region please contact Craig Scott and he will endeavor to arrange a visit to the construction site. Several construction photos follow:



Commencement of the lower reservoir (3MCM) construction to allow the tailrace tunnel portal construction. The pond will eventually become kidney shaped and significantly larger than as shown in this photo.



Drilling equipment above the excavated surge shaft. The construction of the 500m vertical pressure penstock (3.5m diameter) will be by the shaft sinking method with material brought to the surface. The design and construction of the shaft is very complex.



Commencement of the surge shaft construction prior to installation of the drilling rig in the photo previous.



The portal of the upper intake headrace tunnel under construction within the upper reservoir pond



The construction of the #4 Emergency Gallery approximately 1.5km underground from the tailrace access near to the powerhouse cavern location. This is in an area of weak rock geology therefore extensive steel support of the tunnel works is required as shown. The geology is weathered basalt rock.



Craig Scott at the upper surge chamber location during an investor tour. The view is across the River Jordan Valley with Jordan on the far side and the sea of Galilee is to the top left of the photo just out of picture.

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.usdams.org/>

Hydroreview <http://www.hydroworld.com/index.html>

Waterpower Magazine <http://www.waterpowermagazine.com/>