

Guideline Working Group Reports

Guidelines on Design Criteria for Concrete Arch Dams (New)

New guidelines are being considered to formalise the design criteria for concrete arch dams, which complement the existing Guidelines on Design Criteria for Concrete Gravity Dams (2013). The intent is that the guidelines focus only on aspects that are different in arch dams and their foundations.

Marius Jonker

Convenor

| Membership of the Working Group | Company |
|--|-------------------------------|
| Marius Jonker (Convenor) | Aurecon (VIC) |
| Francisco Lopez | SMEC (VIC) |
| Dr Radin Espandar | Entura (VIC) |
| Technical Review Panel | |
| Brian Cooper | Brian Cooper Consulting (NSW) |
| International Expert Review | |
| Dr Yusof Ghanaat | Quest Structures (USA) |

Guidelines on the Consequence Categories for Dams (Watching Brief)

CURRENT STATUS

The current version of the Guidelines on the Consequence Categories for Dams was published in September 2012. A Watching Brief Committee was appointed by the ANCOLD Executive in 2014 to monitor industry trends both nationally and abroad and assess the currency of the existing guidelines against any change in approach to consequence assessment.

The last amendment to the Guidelines was accepted by the ANCOLD Executive in 2015 which was also detailed in the 2015 Annual Report. Since that time, there has been no further queries on the Guidelines or identified need for further amendment.

The Watching Brief committee continues to maintain surveillance on matters associated with the guideline and remains willing to accept any suggestions or comments that may assist with ensuring the guidelines reflect current industry trends.

David Ryan

Convenor

| Membership of the Working Group | Company |
|--|----------------|
| David Ryan (Convenor) | Stantec |

Guidelines on Dambreak Modelling and Consequence Assessment

Significant progress has been made on first drafts of a number of sections of the dambreak modelling and consequence assessment guidelines. The first section of the document (focused on dambreak modelling) is largely complete, and progress is being made on subsequent sections relating to consequence assessment. A reference group composed of 16 representatives from dam owners, regulators and consultants has also been assembled and will start to provide input on draft sections over the coming months.

David Stephens

Convenor

| Membership of the Working Group | Company |
|---------------------------------|-----------|
| David Stephens (Convenor) | HARC |
| Michel Raymond | Seqwater |
| Michael Smith | Watercorp |
| Andrew Northfield | HARC |
| Kevin Bartlett | DEWS |
| Rob Fowden | DEWS |
| Tim Rhodes | SMEC |

Technical Review Panel

There is a reference group of 16 people representing a mix of dam owners, consultants and regulators across all states.

International Expert Review

To be determined

Guidelines on Dam Instrumentation & Monitoring Systems (Watching Brief)

The Watching Brief for the Dam Instrumentation and Monitoring Systems Guidelines (1983) was established following the Dam Instrumentation Workshop and continues to scan for information and topical developments related to the monitoring of dams using a range of instrumentation techniques.

Whilst the 1983 guidelines were comprehensive for their time, they are also the oldest ANCOLD guidelines and celebrated their 38th anniversary this year. They still present a reasonable framework for dam instrumentation and contain useful factual information on the instrumentation of that era, much of which is still generating data at existing dams.

It is felt that the guidelines could be updated to reflect new technologies available, and developments in real time remote monitoring of dams, but no work on this has commenced, pending the outcomes of the update of the 2003 Guidelines on Dam Safety Management, which are closely linked. A Working Group formed in April 2017 to look at reviewing and updating Dam Safety Management Guidelines. This working group will include consideration of the linkages between the two documents, and the future of the Dam Instrumentation and Monitoring Systems Guidelines.

Cassandra Turner of Hydro Tasmania is maintaining this watching brief. Any members wishing to contribute papers, views, or information to the watching brief should contact Cassandra Turner at Cassandra.Turner@hydro.com.au.

As it is still considered a relevant document, the 1983 version of the guideline has been reprinted and can be purchased via the online shopping cart on the Guidelines page

Chris Topham

on behalf of Convenor, Cassandra Turner

| Membership of the Working Group | Company |
|---------------------------------|----------------|
| Cassandra Turner (Convenor) | Hydro Tasmania |

Guidelines on Dam Safety Emergency Plans and Emergency Management

Drafting of content for the new Guideline on Dam Safety Emergency Plans and Emergency planning has been progressing, although more slowly than planned. Comments are soon to be sought from an industry-based reference group.

Angus Paton

Convenor

| Membership of the Working Group | Company |
|--|--|
| Angus Paton (Convenor) | Murray-Darling Basin Authority |
| John Tibaldi | Seqwater |
| Siraj Perera | Department of Environment, Land, Water and Planning |
| Jonathon Reid | SMEC |
| Neil Smith | Hydro Tasmania |
| Reference Group | |
| The membership of the Reference Group is to be reviewed. | |
| International Expert Review | |
| To be decided | |

Guidelines on Dam Safety Management (Updating Guideline)

The focus of activity over the past year has been as a watching brief on matters which may change the content or detail of the updated Guideline and on confirming the administrative arrangements to progress the update with the Executive.

While the intention of the current review is to update the Guidelines, they remain very relevant and outline the basis for good dam safety management practice.

There have been a number of changes in industry practice since the original guideline was produced and these will be reflected in the current revision. These include:

- A strengthening focus on governance and management arrangements for dams including changes in regulatory environments and the increased adoption of documented dam safety management systems,
- The use and acceptance of risk-based approaches to dam safety management, specifically for surveillance and monitoring activities, and the use of new technologies including UAVs for surveillance activities,
- A more structured approach to the use of independent technical review of dam projects,
- Recognition of the use of electronic based systems for data and record storage including the use of integrated asset management systems by many dam owners,
- Developments in dam break, consequence assessments, risk assessment and safety reviews, and
- Relationships with existing and planned ANCOLD Guidelines.

The revision to the Guideline will also consider how it could compliment the principles of ISO55000 which is used by many dam owners for alignment with modern asset management principles, and also how to provide appropriate guidance for dam safety in the mining industry.

A Working Group is currently being established to progress the update and after an expression of interest process, the ANCOLD Executive has appointed a Young Professional dams engineer from Tasmanian Irrigation, Josh Clark, to provide support and to work with the working group in the update.

David Stewart

Convenor

| Membership of the Working Group | Company |
|--|--|
| David Stewart (Convenor) | Australian Dams & Water Consultants Pty Ltd |
| Mark Arnold | Melbourne Water |
| Oliver Giudici | Hydro Tasmania |
| Martin Weir | WaterNSW |
| Chris Nielson | Queensland Department of Regional Development, Manufacturing & Water |
| Josh Clark | Tasmanian Irrigation |
| Louise Thomas | GHD |
| Jarrad Coffey | Rio Tinto |
| Technical Review Panel | |
| To be confirmed | |
| International Expert Review | |
| To be confirmed | |

Guidelines on the Design Criteria for Concrete Gravity Dams (Watching Brief)

The current Guidelines on the Design Criteria for Concrete Gravity Dams were published in September 2013. A Watching Brief Committee was appointed by the ANCOLD Executive the following year to monitor industry trends both nationally and abroad and assess the currency of the existing guidelines against any change in approach to the design criteria we have adopted.

Some possible inconsistencies in the determination of the stability analysis have been identified and these will be checked to determine if an amendment to the Guidelines is required. Ongoing surveillance on matters associated with the guidelines, including progress on relevant ICOLD Bulletins will continue to be maintained.

David Ryan

Convenor

| Membership of the Working Group | Company |
|--|-------------------|
| David Ryan (Convenor) | Stantec |
| Michael Somerford | Water Corporation |

Guidelines on Design of Dams and Appurtenant Structures for Earthquake

The revised Guideline was published in June 2019 and is available for purchase from the ANCOLD Website. A watching brief is being maintained.

Steve O'Brien

Convenor

| Membership of the Working Group | Company |
|--|-----------------------------------|
| Steve O'Brien (Convenor) | AECOM |
| Ian Landon Jones | Independent Consultant |
| Emeritus Professor Robin Fell | Independent Consultant/UNSW |
| Brian Cooper | Independent Consultant |
| Technical Review Panel | |
| Jon Williams | GHD |
| Peter Allen | Dam Safety Regulator QLD, DEWS |
| Graeme Bell | Independent Consultant |
| David Ryan | Independent Consultant |
| Gary Gibson | ES&S |
| Gavan Hunter | AECOM |
| Andrew Reynolds | MDBA |
| David Brett | GHD |
| Paul Somerville | Risk Frontiers/AECOM |
| Bandula Kendaragama | SMEC |
| Dan Forster | Dam Safety Intelligence |
| Nihal Vitharana | ARUP |
| International Expert Review | |
| Dr Lelio Mejia | Geosyntec Consultants |
| Trevor Matuschka | Engineering Geology Ltd |
| Dr Martin Wieland | Independent Consultant |

Guidelines on the Design, Construction, Operation of Retarding Basins- Wetlands and Large Ornamental Lakes (New Guideline)

The Guidelines have been out for Review by ANCOLD Membership and the development industry consultants and the late Phil Cummins also acted as Peer Review. These reviews have been collated and the DRAFT will be amended/re-written as required. (The most valuable review feedback came from Em. Prof. Robin Fell and as would be expected, it will contribute to a significantly better document. The Working Group is very grateful for the time Robin contributed to undertake such a detailed review.)

The original process envisaged production of a Commentary as an Appendix; with the aim of dealing with clarifications that addressed questions based on the feedback from the Review process. This process has commenced; but the Commentary will be longer than originally envisaged. It will also bring the document to the standard ANCOLD format. Additional drawing/diagrams have been developed to illustrate details to address identified potential failure modes.

The re-write and production of a Commentary will now take several months of effort from the Working Group and Convenor as the document will be much larger, (than originally envisaged and as circulated for comment). We acknowledge that this process has taken too long but we anticipate that a concerted effort will get it to the Executive by mid-2022..

Richard Rodd

Convenor

| Membership of the Working Group | Affiliation |
|--|---------------------------|
| Richard Rodd (Convenor) | Richard Rodd & Assoc. P/L |
| Mark Arnold | Melbourne Water |
| Norm Himsley | Consultant |
| International Expert Review | |
| Not Required | |

Guidelines on Geotechnical Investigations of Dams, their Foundations, and Appurtenant Structures

The Guideline is complete and was published in May 2020.

The Working Group has finished its work and is no longer active.

Robin Fell

Convenor

| Membership of the Working Group | Company |
|---|--|
| Emeritus Professor Robin Fell (Convenor) | School of Civil and Environmental Engineering, University New South Wales, Sydney |
| Dr Gavan Hunter | Technical Director Dam Engineering, AECOM, Melbourne |
| Mr Paul Southcott | Specialist Civil Engineer, Entura, Hobart. |
| Mr Geoff Eades | Consulting Engineering Geologist (retired), Brisbane. |
| Mr Alan Moon | Consulting Engineering Geologist, Adelaide. |
| Mr Andrew Barclay | Principal Engineering Geologist, GHD, Canberra. |
| Mr Deryk Forster | Principal Engineering Geologist, SMEC Australia, Brisbane. |
| Mr Barton Maher | Principal Engineer Storage Planning, SEQWater, Brisbane. |
| Mr Neil Smith | Dam Safety Manager, Hydro Tasmania, Hobart. |
| Mr Richard Rodd | Richard Rodd and Associates, Albury/Wodonga. |
| Technical Review Panel | |
| Mr Philip Cummins | Consultant |
| Mr Alan White | Senior Engineer Dam Safety, TasWater |
| Mr Norm Himsley | NSW Dams Safety Committee and Consultant |
| International Expert Review | |
| None Required | |

Guidelines on Outlet Works for Dams (New)

New guidelines are being developed on outlet works for dams. The guidelines comprise a suite of ten standalone Practice Notes that cover the design, procurement, construction, installation, commissioning, operation, maintenance, rehabilitation, upgrade and risks of dam outlet works. In addition, the Practice Notes cover the civil, structural, mechanical, electrical and control elements in outlet works systems. The Working Group has prioritised the Practice Notes with the current drive during monthly Skype and Teams meetings over the past year, to complete the Practice Notes on Rehabilitation, Modernization & Upgrade, the Practice Notes on Operation & Maintenance, and the Practice Notes on Outlet Works Risks.

The working group have been developing a questionnaire to gather information relating to the operational practices of spillway gates and outlet works of Australian Dam Owners. Once developed the questionnaire will be forward to member organisations.

Marius Jonker

Convenor

| Membership of the Working Group | | Company |
|--|--|------------------------------------|
| Marius Jonker (Convenor) | | Aurecon (VIC) |
| Glen Hobbs | | Glen Hobbs & Associates (NSW) |
| Frank Nitzsche | | GHD Pty Ltd (NSW) |
| David Law | | Entura (TAS) |
| Reference Group | | |
| Brian Simmons | | WaterNSW |
| Charlie Curro | | Department of Public Works (NSW) |
| David Ryan | | Stantec (QLD) |
| Rod Mauger | | Australian Asset Engineering (VIC) |
| Trevor Lange | | Goulburn-Murray Water (VIC) |
| Alex Gower | | Water Corporation (WA) |
| Additional Members | | |
| Pieter van Breda | | Project Manager |
| Michel Raymond | | Executive Committee Liaison |
| Technical Review Panel | | |
| Marty Gross (Electrical) | | Retired from Hydro Tas (TAS) |
| Brian Cooper (Civil) | | Brian Cooper Consulting (NSW) |
| International Expert Review | | |
| Vacant | | |

Guidelines on Risk Assessment

Immediately prior to the 2015 Annual Conference a workshop was held to seek feedback from Members on proposed content for an updated Guidelines on Risk Assessment.

Submissions were subsequently received from Members and the Reference Group. The Working Group considered these and provided an update to members for comment at the risk workshop held as part of the 2020 virtual conference. A first draft of the updated guideline was then sent for review by the Reference Group in late November 2020. The draft was again updated and the revised draft issued in August 2021. The Working Group expects that this last round of review will allow a final draft to be considered by the Executive and the document finalised before the end of 2021.

Shane McGrath

Convenor

| Membership of the Working Group | Company |
|--|------------------------|
| Shane McGrath (Convenor) | SGM Consulting |
| Malcolm Barker | GHD |
| Emeritus Professor Robin Fell | UNSW Global Consulting |
| Mark Foster | AECOM |
| Peter Hill | HARC |
| Len McDonald | Retired |
| Reference Group | |
| Graeme Bell | Siraj Perera |
| Peter Allen | Michael Somerford |
| Gamini Adikari | Angus Paton |
| Mark Arnold | Paul Southcott |
| Andrew Reynolds | Barton Maher |
| Ian Landon-Jones | David Ryan |
| Chris Topham | Andrew Richardson |
| Kelly Maslin | Bruce Duncan |
| Brian Cooper | Glen Hobbs |
| International Expert Review | |
| The Executive has determined that international review is not required for the update of this guideline. | |

Guidelines on Selection of Acceptable Flood Capacity (Revised Guideline)

The ANCOLD Guidelines on Selection of Acceptable Flood Capacity (AFC) were published in 2000 and provide guidance on the selection of design flood capacities for dams. A Working Group was established in early 2014 and is supported by a Reference Group representing owners, consultants and regulators from around Australia.

Development of the guidelines has slowed over the last 2 years, however the draft guidelines are now complete and will shortly be available for review by industry.

Peter Hill

Convenor

| Membership of the Working Group | Company |
|--|---|
| Peter Hill (Convenor) | HARC |
| Fiona Ling | WMAwater |
| Michel Raymond | Seqwater |
| Andrew Reynolds | Murray-Darling Basin Authority |
| Michael Somerford | Water Corporation WA |
| Reference Group | |
| Peter Allen | Queensland Department of Energy and Water Supply |
| Mark Arnold | Melbourne Water |
| Malcolm Barker | GHD |
| Peter Cloke | NSW Urban Water Services |
| Janice Green | Bureau of Meteorology |
| Norm Himsley | Consultant, formerly NSW Dams Safety Committee |
| Barton Maher | Seqwater |
| Joe Matthews | Southern Rural Water |
| Shane McGrath | SGM Consulting |
| Nanda Nandakumar | WaterNSW (dec. May 2020) |
| Angus Paton | Murray-Darling Basin Authority, formerly SA Water |
| Siraj Perera | Victorian Department of Environment, Land, Water and Planning |
| Michael Thornton | Snowy Hydro Limited |
| Independent Reviewers | |
| Rory Nathan | University of Melbourne |
| Phil Cummins | Australian Dams and Water Consultants (dec. Nov 2019) |

Guidelines on Tailings Dams - planning, design, construction, operation and closure)

The tailings dam sub-committee has made substantial progress in reinvigorating itself with a new structure up and running, aiming to review the current Tailings Dam Guidelines to account for the Global Industry Standard on Tailings Management (GISTM) and the pending ICOLD Tailings Dam Safety Bulletin.

The new sub-committee structure is shown in the table that follows over the page.

Brett Stephens has taken the role of convenor of the working group. Many thanks to all who expressed interest in helping. If you are not on the committee you will still be involved through the tailings interest group and will be kept informed of issues and your opinions sought.

I make special mention of the retiring members Imran Gillani and Faye Akbar who have moved to Canada with Rio Tinto and have therefore resigned. Imran in particular has given many years' service to ANCOLD and Faye has been an active member for the past few years.

The sub-committee is currently looking at an issue raised by Jiri Herza after a WA Tailings Interest Group meeting in Perth where attendees questioned the application of PAR to workers at the mine site. The meeting overwhelmingly recommended that workers should be included, which differs to the requirement of the ANCOLD Consequence Guidelines. This issue is being reviewed and highlights some of the conditions associated with tailings dams that differ from water dams.

David Brett

Past Convenor

| Membership of the Working Group | Company |
|--|----------------|
| Academia | |
| David Williams | UQ |
| David Reid | UWA |
| Industry | |
| Justin Willis | BHP |
| Jarrad Coffey | Rio |
| James Robinson | Alcoa |
| Dave Luppnow | South 32 |
| Consulting | |
| Jiri Herza | HATS |
| Genevieve New | ATC |
| Brett Stephens (Convenor) | KCB |
| Michael Ashley | GHD |
| Wade Ludlow | Red Earth |
| Regulator | |
| Jay Ranasooriya | DMIRS, WA |
| Kevin Bartlett | DNRME, Qld |
| Peer Review Group | |
| Keith Seddon | |
| Bruce Brown | |
| John Phillips | |
| Norm Himsley | |
| David Brett | |
| Stephen Newman | |
| Andy Fourie | |

CONFERENCES

The trend in registered delegates for the previous six conferences are provided below.

| Conference Year | Location | Registrations |
|------------------------|-----------------|----------------------|
| 2015 | Brisbane | 252 |
| 2016 | Adelaide | 279 |
| 2017 | Hobart | 316 |
| 2018 | Melbourne | 379 |
| 2019 | Auckland, NZ | 378 |