

Technical

ANCOLD places importance on providing technical guidelines and training that meet and advance good practice.

Guidelines

The process of preparing a guideline requires considerable voluntary effort by a number of busy professionals over an extended period. The following sections provide an update from each of the working groups. The following key points provide a summary of the activity for this year:

- A Guideline on Design, Construction and Operations & Maintenance of Retarding Basins is progressing with consideration of the comments obtained from industry consultation .
- The updated Guidelines on Selection of Acceptable Flood Capacity is close to final and will also be available for comment in the near future.
- The content for a new Guideline on Dam Safety Emergency Plans and Emergency Planning has developed further after feedback from the Reference Panel and will be a focus for the workshop at the 2022 Conference in Sydney.
- The update of the Guidelines on Risk Assessment is complete and endorsed by the Executive for publication with availability for purchases expected around September 2022.
- An update of the Guidelines on Dam Safety Management has continued work with consultation input/ reconnaissance activities underway to inform direction for the update of this important Guideline.

Guideline Working Groups (Active) status reports

Guideline	Status	Convenor
Dam break modelling and Consequence Assessment	New guideline in preparation.	David Stephens
Dam Safety Emergency Plans and Emergency Management	New guideline in preparation.	Angus Paton
Dam Safety Management	Updated guideline in preparation. 2003 version is still available for purchase	David Stewart
Design, Construction, Operation of Retarding Basins-Wetlands and Large Ornamental Lakes	Draft guideline prepared for comment by Executive Committee.	Richard Rodd
Design Criteria for Concrete Arch Dams	New guideline in preparation.	Marius Jonker
Outlet Works for Dams	New guideline in preparation.	Marius Jonker
Risk Assessment	Updated version published in July 2022. 2003 version removed from sale.	Shane McGrath
Selection of Acceptable Flood Capacity for Dams	Updated guideline in final stages of preparation. 2000 version is still available. For purchase	Peter Hill
Tailings Dams – Planning, Design, Construction, Operation and Closure – REVISION 1	Revision 1 published in 2019. Major review underway in light of global tailings standard. Revision 1 (2019) is still available for purchase	Brett Stephens

Dam break modelling and Consequence Assessment

An update on this Working Group was not available at the time of presentation of this Annual Report.

David Stephens

Convenor

Dam Safety Emergency Plans and Emergency Management

The first draft of the DSEP has been completed. The Reference Group have reviewed the draft and submitted their comments which have also been considered by the Working Group. A half day workshop the day before the 2022 ANCOLD Conference will present key themes of the proposed Guidelines and Reference Group comments for discussion by the wider group.

Angus Paton

Convenor

Membership of the Working Group	Company
Angus Paton	Murray-Darling Basin Authority
John Tibaldi	Seqwater
Siraj Perera	Department of Environment, Land, Water and Planning
Jonathon Reid	GHD
Neil Smith	Hydro Tasmania
Paul Sureda	Murray Darling Basin Authority
Reference Group	
Russell Dippy	South Australia Police
Michael Smith	Water Corporation
Laurie Dwyer	Department of Natural Resources and Environment (NRE) Tasmania
Damien Bryan	Water NSW
Craig Ronan	NSW State Emergency Service
David Jeffery	Goulbourn Murray Water
Michel Raymond	Seqwater
Chris Nielsen	Department of Regional Development Manufacturing and Water Queensland
International Expert Review	
To be decided	

Dam Safety Management

Since the last report the Working Group has re-formed and is progressively reviewing the DSM Guidelines. The Working Group includes representatives from dam owners, consultants and regulators and includes Jarrod Coffey, as a tailings dam owner and also a member of the Working Group on the Guidelines on Tailing Dams. The Working Group also have input from Cassandra Turner, as the Convenor of the Guidelines on Instrumentation.

Shane McGrath has agreed to take on the role of a Special Advisor to the Working Group to provide initial feedback and challenge to the team during the development of the revised guideline. The processes for further review by a Reference Panel, general ANCOLD membership and Independent Reviewers will be considered.

The Working Group is working through an Issues Register based on feedback initially received from ANCOLD Members at a workshop held at the 2017 Conference, subsequent developments, issues and matters raised by members of the Working Group and their respective industry contacts.

Key areas of focus for the Working Group to date have been to review the structure and content of the existing Guideline, noting that it remains very relevant and continues to outline the basis for good dam safety management practice. There are a number of matters being considered including:

- An alignment of the structure and terminology of the Guideline with ISO 55000 Asset Management Systems which is now widely used by the majority of larger dam owners, without limiting accessibility or relevance to all other owners.
- A strengthened focus on governance and management arrangements for dams including changes in regulatory environments.
- A structured approach to the development and implementation of an integrated Dam Safety Management System for dam owners.
- The use and acceptance of risk-based approaches to dam safety management, specifically for surveillance and monitoring activities, and also the use of new technologies.
- A more structured and systematic approach the use of technical review of specific projects and for audit of overall dam safety programs,
- 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, safety reviews and safety cases for dams.
- Ensuring compatibility with issues being considered by the Working Group on Tailings Dam Guidelines.
- Relationships with other existing and planned ANCOLD Guidelines including the potential for streamlining the DSM Guideline where issues are better dealt with in other Guidelines such as Dam Safety Emergency Plans and Instrumentation.
- General updates and modernisation of terminology and language through the document.

Briefing sessions have been held with the Queensland Dam Owners and Operators Forum and The Victorian Dams Industry Working Group from whom useful feedback was received on the review process and progress. Offers for similar briefing sessions will be made to other interested groups. .

The current schedule aims to provide a draft copy of the revised document to the Executive in late 2023 for consideration.

David Stewart

Convenor

Working Group	Company
David Stewart (Convenor)	Australian Dams & Water Consultants Pty Ltd
Mark Arnold	Melbourne Water Corporation
Josh Clark	Tasmanian Irrigation Pty Ltd
Jarrad Coffey	Rio Tinto
Oliver Giudici	Hydro Tasmania
Gayantha Jayasekara	WaterNSW
Chris Nielsen	Queensland Department of Regional Development, Manufacturing and Water
Louise Thomas	GHD
Special Advisor to the Working Group	
Shane McGrath	SGM Consulting (Aus) Pty Ltd
Reference Group	
To be determined	
Independent Reviewers	
To be decided	

Design, Construction, Operation of Retarding Basins-Wetlands and Large Ornamental Lakes

The Guidelines have been out for consultation feedback from the ANCOLD Membership and the development industry consultants. The late Phil Cummins has acted as Peer Reviewer for the Guidelines. These reviews have been collated and the draft Guideline will be amended/re-written as required.

The production of a Commentary is aiming to address clarifications on questions raised in the feedback from the Review process. This process has commenced by the Convenor; however, the Commentary will be longer than originally envisaged. Additional drawing/diagrams have been developed to illustrate details to address identified potential failure modes. The re-write and production of a Commentary has been progressing for 12 months and will require further effort from the Working Group and Convenor as the document is larger than originally envisaged and as circulated for comment. The current schedule aims to provide a finalised copy to the Executive in 2023.

Richard Rodd

Convenor

Working Group	Company
Richard Rodd (Convenor)	Richard Rodd & Associates Pty. Ltd.
Norm Himsley	Independent Consultant
Mark Arnold	Melbourne Water Corporation
Reference Group	
Development Industry Consultants	
Independent Reviewers	
(the late) Phil Cummins	

Design Criteria for Concrete Arch Dams

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

The development of these guidelines has been paused awaiting confirmation of whether to proceed with these guidelines.

Marius Jonker

Convenor

Working Group	Company
Marius Jonker (Convenor)	Aurecon Australasia
Francisco Lopez	SMEC
Dr Radin Espandar	Entura
Special Advisor to the Working Group	
Shane McGrath	SGM Consulting (Aus) Pty Ltd
Reference Group	
Marius Jonker (Convenor)	Aurecon Australasia
Independent Reviewers	
Dr Yusof Ghanaat	Quest Structures (USA)

Outlet Works for Dams

New guidelines are being developed on outlet works for dams. The guidelines will comprise nine chapters that are grouped in four parts covering the planning, design, construction and operation life cycle phases of outlet works. Over the last year significant progress has been made on Chapter 1 covering outlet works configurations, key components and functions, Chapter 7 covering inspections and testing, Chapter 8 covering rehabilitation and upgrading, and Chapter 9 covering risk and outlet works. These chapters will support dam owners in managing their operating priorities of operational excellence, sustaining capital and understanding business and life safety risks associated with outlet works.

Further work is planned to commence on Chapters 2 to 6 covering the design of the civil, structural, mechanical, electrical and control elements, as well as the procurement, construction, installation, commissioning, of outlet works. The Working Group has meeting fortnightly by video conferencing over the past year.

Marius Jonker

Convenor

Membership of the Working Group	Company
Marius Jonker	Aurecon Australasia
Glen Hobbs	Glen Hobbs & Associates
Frank Nitzsche	GHD Pty Ltd
David Law	Entura
Constantine Papas	GHD Pty Ltd
Reference Group	
Brian Simmons	WaterNSW
Charlie Curro	Department of Public Works
David Ryan	Stantec
Rod Mauger	Australian Asset Engineering
Alex Gower	Water Corporation
Additional Members	
Pieter van Breda	Project Manager
Paul Maisano	Executive Committee Liaison
Independent Reviewers	
Marty Gross (Electrical)	Retired from Hydro Tas
Brian Cooper (Civil)	Brian Cooper Consulting

Risk Assessment

Immediately prior to the 2015 Annual Conference a workshop was held to seek feedback from Members on proposed content for an update of the 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 updated Guidelines have been endorsed for publication by the Executive and will be available for purchase in September 2022.

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	Dam Consulting Services
Peter Hill	HARC
Len McDonald	Retired
Reference Group	
Phillip Cummins (dec)	Brian Cooper
Graeme Bell	Mark Arnold
Peter Allen (dec)	Barton Maher
Kelly Maslin	Andrew Reynolds
Ian Landon-Jones	Michael Somerford
Chris Topham	Angus Paton
Bruce Duncan	Gamini Adikari
Siraj Perera	Paul Southcott

International Expert Review

The Executive has determined that international review is not required for the update of this guideline.

Selection of Acceptable Flood Capacity for Dams

An update on this Working Group was not available at the time of presentation of this Annual Report.

Peter Hill

Convenor

Guidelines on Tailings Dams

The Tailings Working Group (TWG) was formed in 2021 and is working to presenting results of work on updating the guidelines at the 2023 Annual Conference. A few the Tailings Working Group are also part of other working groups and are working to incorporate this involvement into the new guidance document (notably the Update to the Guidelines on Dam Safety and Dam Break Modelling and Consequence Assessment). Others in the group have been tasked to contact other groups as considered necessary to update the guidelines. The Working Group has reframed the document to correspond more towards the Dam Safety Guidance Document and have selected lead authors and support groups for each section. Workshops are planned with stakeholder groups in Perth and Brisbane in October 2022. These Workshops will seek feedback on the current guidance document from members for inclusion or updating of the document. A questionnaire has also been issued to Stakeholder to support these workshop events.

Brett Stephens

Convenor

Membership of the Working Group	Company
Michael Ashley	HATS Consulting
Kevin Bartlett	Qld Dept of Resources
Jarrad Coffey	Rio Tinto
Jiri Herza	HATS Consulting
Wade Ludlow	Red Earth Engineering
Dave Lupnow	Suth32
Genevieve New	ATC Williams
Jay Ranasooriya	DMIRS WA
David Reid	UWA
James Robinson	Alcoa
Brett Stephens (Convenor)	Archadia Consulting
David Williams	UQ
Justin Willis	BHP
Technical Review Panel	
David Brett	GHD
Bruce Brown	Bruce Brown Consulting
Andy Fourie	AWU
Norman Himsley	Independent Consultant
Stephen Newman	MMG
John Philips	GHD
Keith Seddon	ATC Williams

Guideline Working Groups (Watching Brief) status reports

Guideline	Status	Convenor
Consequence Categories for Dams (2012)	2012 version available for purchase	David Ryan
Dam Instrumentation & Monitoring Systems (1983)	1983 version available for purchase.	Cassandra Turner
Design Criteria for Concrete Gravity Dams (2013)	2013 version available for purchase.	David Ryan
Design of Dams and Appurtenant Structures for Earthquake (2019)	2019 version available for purchase	Steven O'Brien
Geotechnical Investigations of Dams, their Foundations, and Appurtenant Structures (2020)	2019 version available for purchase	Robin Fell
Strengthening and Raising Concrete Gravity Dams (1992)	1992 version available for purchase.	Richard Rodd
Environmental Management of Dams (2001)	2001 version available for purchase.	Vacant
Regulation and Practice for the Environmental Management of Dams in Australia (2014)	2014 version available for purchase.	Vacant

Consequence Categories for Dams (2012)

A Watching Brief Committee was appointed by the ANCOLD Executive in 2014 following the September 2012 release of the current version of the guidelines. The purpose of the committee is 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 have 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 consider any suggestions or comments that may assist with ensuring the guidelines reflect current industry trends.

David Ryan

Convenor

Dam Instrumentation & Monitoring Systems (1983)

The Watching Brief for the Guidelines for Dam Instrumentation and Monitoring Systems (1983) was established following the Dam Instrumentation Workshop at the ANCOLD conference in Sydney 2006. It continues to scan for new information and developments in the fields of instrumentation and monitoring of dams.

The 1983 guidelines were comprehensive for their time however they are also the oldest ANCOLD guidelines and had their 38th anniversary this year. Whilst they still contain useful information on the instrumentation of that era (much of which is still in use at older dams), it is no longer useful for providing dam owners with contemporary guidance on instrumentation and monitoring.

Work to update this Guideline has not yet commenced, as it is awaiting the update of the Guidelines on Dam Safety Management (2003), which will provide some general guidance as to surveillance and monitoring best practice. The current convenor of this Watching Brief is also involved in the update of the Guidelines on Dam Safety Management (2003) to ensure effective integration between the two documents.

The updated Guidelines will include the following considerations:

- Contemporary monitoring technologies available to dam owners.
- Developments in the frequency of data acquisition (real-time and near-real-time monitoring) and the implications for data processing and evaluation.

- Guidance as to the fundamental design of a surveillance and monitoring regime for a dam (with direct reference to the future version of the Guidelines on Dam Safety Management (2003)).
- Retaining relevant historical instrumentation information in the existing 1983 Guideline as a reference for older instruments and technologies which are still in service.

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 on the ANCOLD website.

Cassandra Turner

Convenor

Guidelines on Design Criteria for Concrete Gravity Dams (2013)

A Watching Brief Committee was appointed by the ANCOLD Executive in 2014 following the release of the current version of the guidelines. The purpose of the committee is 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 that have been adopted.

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

David Ryan

Convenor

Membership of the Watching Brief Committee	Company
David Ryan (Convenor)	Stantec, Australia
Michael Somerford	Water Corporation, West Australia

Design of Dams and Appurtenant Structures for Earthquake (2019)

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

Other Guidelines with a Watching Brief

The following ANCOLD Guidelines are available for purchase on the ANCOLD website, and a watching brief is being maintained by the convenor (as listed in the table at the start of this section).

- Consequence Categories for Dams (2012)
- Design Criteria for Concrete Gravity Dams (2013)
- Geotechnical Investigations of Dams, their Foundations, and Appurtenant Structures (2020)
- Strengthening and Raising Concrete Gravity Dams (1992)
- Environmental Management of Dams (2001)
- Regulation and Practice for the Environmental Management of Dams in Australia (2014)

