

Sector changes hold water

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Dams fulfil an increasingly vital role in the wellbeing of all New Zealanders, serving water supply, renewable energy production, flood mitigation, recreation, irrigation and process industries. Our world-renowned dams industry and community is in an exciting growth phase, responding to water demand, decarbonisation, climate conditions and natural hazards, society's safety, environmental and cultural expectations, and regulatory change.

While dams provide significant benefits, they must also be designed, constructed and operated safely, commensurate to the potential impacts of failure. They must perform under a range of conditions including reservoir load, flood passage and earthquake ground motions. In May 2022, the Government set out new regulations to improve the safety and resilience of Aotearoa's dams in the operational (post-construction) phase of the dam lifecycle.

Dams are defined in the Building Act as an artificial barrier, and appurtenant structures, that are constructed to hold back water, or other fluid, under constant pressure, to form a reservoir, and are used for storage, control or diversion of water or other fluid. Stopbanks designed to control floodwaters are not included in the definition of a dam.

New regulations

The Building (Dam Safety) Regulations 2022 have been created because while

Aotearoa has well-developed industry-recommended practices, unlike almost all other Organisation for Economic Co-operation and Development member countries, it doesn't have a consistent regulatory dam safety framework. This absence puts people, property and the environment at unnecessary risk of the potential impacts of dam failure.

The new regulations will commence in 2024 and ensure classifiable dams are well-operated, maintained and regularly monitored. The new operational phase dam safety regulations will supplement the well-established regulation of dam design and construction in the Building Act, both of which have benefited from strong industry guidelines produced by the New Zealand Society on Large Dams (a Te Ao Rangahau technical industry group) for almost three decades.

While many dam owners voluntarily follow the industry's recommended dam safety practices in the New Zealand Dam Safety Guidelines, the new regulations specify minimum requirements that must be fulfilled by all owners of dams that are classified as high and medium potential impact classification. Low potential impact classification dams will not have requirements under the new dam safety regulations. Potential impact classification is a measure of the potential impacts of a hypothetical dam failure on people, property and the environment.

The regulations also include definitions of dangerous dams, earthquake-prone dams and flood-prone dams, as well

as actions their owners must take to notify the regional authority and follow the regional authority's dangerous and prone dams policy. Dangerous and prone dams are those that fall significantly short of recommended design performance criteria for normal, flood and earthquake loads.

Classifiable dams are those meeting either of the following height and stored volume screening thresholds: 4m height and 20,000m³ stored volume, or 1m height and 40,000m³ stored volume. Classifiable dams must be assigned a potential impact classification (high, medium, low) and have it certified by a Recognised Engineer.

Requirements for dam owners, practitioners and regional authorities

The new regulations include requirements for owners of medium and high potential impact classification dams to prepare and implement an ongoing Dam Safety Assurance Programme (DSAP). The DSAP will include procedures for dam operation, maintenance, monitoring, inspections, testing, engineering reviews, emergency preparedness and managing issues and deficiencies. The DSAP will need to be certified for use, then audited for completion annually, by a Recognised Engineer (Chartered Professional Engineer with dam safety competencies). Te Ao Rangahau is working with NZ Society on Large Dams (NZSOLD) and the Ministry of Business, Innovation and Employment (MBIE) to develop the Recognised Engineering assessment framework

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and assess new Recognised Engineers. The assessment framework will align with the Chartered Professional Engineer assessment process.

Co-regulation

MBIE's Building Performance owns the dam safety regulations and will co-regulate their implementation with New Zealand's regional authorities, who will administer the regulations for dams and dam owners in their region. Dam owners, technical practitioners and regional authorities can learn more about how to fulfil the regulations and can utilise support resources at

building.govt.nz/managing-buildings/dam-safety Further tools and educational resources will be developed to support regulations understanding and implementation.

NZSOLD and industry's role

NZSOLD continues to provide vital support to its industry, members and the public with advocacy, recommended practice guidelines, events and training that advance the state of practice for dam design, construction, operation, and management. The internationally benchmarked New Zealand Dam Safety Guidelines are the pseudo-standard

and body of knowledge that allow New Zealand's existing dam design and construction regulatory system, and upcoming dam safety regulations, to function. The New Zealand Dam Safety Guidelines provide New Zealand-specific recommended practice that cascades from international practices and bulletins published by the International Commission on Large Dams and other countries with reputable dams practice. ■

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