

7 March 2019

Hon Jenny Salesa

Minister for Building and Construction
Minister for Ethnic Communities
Parliament Offices
Private Bag 18041
Parliament Buildings, Wellington 6160

Dear Minister Salesa

It was a pleasure to meet you on 6 September, in my capacity as a Member of the Chartered Professional Engineers Council. At the time, you indicated your willingness to hear from me as Chair of the New Zealand Society on Large Dams (NZSOLD). Recently I have handed the Chair role to Trevor Matuschka, and this letter comes to you from both of us. We appreciate your openness to engaging with our Technical Group.

Support for Progressing Dam Safety Regulations

We welcome the government's willingness to not only address engineering and safety issues of recent past (for example Christchurch earthquake building collapses, Pike River Mine tragedy) but to act to prevent future tragedies.

NZSOLD has engaged with successive governments for 30 plus years regarding dam safety regulatory proposals. We want to see dam safety regulations finally put into effect before the next election, to reduce the ongoing exposure of our people, country and assets to risks posed by poorly managed dams.

NZSOLD

NZSOLD is a Technical Interest Group (TIG) of Engineering NZ and member of the International Commission on Large Dams (ICOLD). Our Mission:

"We aim 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 promote cooperation between stakeholders with an interest in dams. This includes technical, regulatory and owner representatives as well as the general public. NZSOLD develops and provides information to members and represents the industry at government level. We actively review and share information on an international stage to best represent dam practice in New Zealand."

Influences on Dam Safety in NZ

Dams are an essential part of our infrastructure - for water supply, power generation, irrigation, mining and more. Interest in Dam Safety regulation tends to be sparked by dam failures or incidents. However, as time passes since the last dam safety incident, impetus to prioritise dam safety fades. The number of significant dam failures or incidents in NZ is unknown, but the attached Table 1 gives an overview of influences on dam safety in NZ.

Dams are most likely to fail on first filling, when they are first exposed to reservoir loads. International studies show that there is then 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.

Recent research by the University of Canterbury (to support MfE's attempts to establish an NES for dam safety) indicate that there are medium and high potential impact dams in NZ (where failure would result in loss of life, significant damage to property and/or environment) that suffer from one or both of the above.

The regulations proposed over many years aim to ensure that owners of such dams are doing the basics in terms of managing the risks their structures pose.

International trends in dam safety regulation

Preliminary findings released from a current study by the World Bank, "*Legal and Institutional Frameworks for Dam Safety: A Comparative Global Assessment*" (paper to be released later this year), indicate that most high-income countries have an independent dam safety authority (New Zealand is in the World Bank high income category). While NZSOLD has provided technical guidance through the NZ Dam Safety Guidelines, for a high-income country, we are an outlier. The study noted that:

"Self-regulation in the absence of any enabling legislation, technical guidance or monitoring and reporting requirements highlights significant gaps and poses substantial risks".

NZSOLD Position on Dam Safety Regulation

Our membership is frustrated that dam safety regulations have not been implemented despite many years of discussions. Recently we have re-engaged with MBIE to assist in preparation of a proposed draft discussion document, with the aim of progressing dam safety regulations under the Building Act.

NZSOLD remain concerned about the risk of a dam failure that could potentially result in loss of life or significant damages before our Government implements regulations.

NZSOLD would support the Minister in moving dam safety regulations into effect before the next election, to avoid any further delays and disillusionment, and to reduce the ongoing exposure of our people, country and assets to risks posed by poorly managed dams.

Request for meeting

We appreciate the work you are doing and would very much like to meet with you to elaborate on the above and to answer any questions you may have for us. We look forward to hearing from you.

Yours sincerely

Rebecca Knott



Immediate Past Chair

Trevor Matuschka



Chair

Table 1: Influences on Dam Safety in New Zealand

| Period | Event or action | Fatalities | Comment | Gov. Dept. | Legislation |
|----------------------------|--|--------------------------|---|----------------------|------------------------|
| 1967 | NZ Matahina Dam | 0 | Core cracking and erosion on first filling in 1967 and had to undergo repair | | |
| 1972 | USA Buffalo Creek flood | 125 | | | |
| 1972 | USA Canyon Lake Dam | 238 | | | |
| 5 th June 1976 | USA Teton dam - earthen dam on the Teton River in Idaho, suffered a catastrophic failure as it was filling for the first time. | 11 people, 13,000 cattle | It was not until the string of significant dam failures in the 1970s that awareness was raised to a new level among the states and the federal government – and internationally | | |
| 1977 | USA Laurel Run Dam (Johnstown) | 40 | | | |
| 1977 | USA Kelly Barnes Dam | 39 | | | |
| 1980 | USBR SEED manual published | | Safety Evaluation of Existing Dams manual – spread internationally | | |
| 20 th Sept 1981 | NZ Ruahihi power station canal failure | 0 | One day after its official opening by then Prime Minister Robert Muldoon | | |
| 1981 | NZSOLD formed | | | Ministry of Commerce | Standalone legislation |
| 30 th Dec 1982 | NZ Wheao canal failure | 0 | Low probability high impact | | |
| 1983 | USBR SEED manual revised | | | | |
| 2 March 1987 & 25 Dec 1987 | NZ Matahina dam earthquake and later discovery of further voids | 0 | ECNZ | | |
| Dec 1988 | First New Zealand Dam inventory published | | Ministry of Works | | |
| Dec 1994 | NZ dam inventory published | | MOC | | |
| 1995 | NZ Coeur Gold tailings dam | 0 | Land on which dam and stored tailings are located moved. No release of tailings occurred. | | |
| 1990s | Failure of two irrigation dams in Northland; Failure of three dams in Marlborough | 0 | Northland dams – deep seated failure through foundations before water was impounded; Marlborough dams - one dam embankment erosion, one spillway washout, one dam stability failure | | |
| 1995 | NZSOLD Dam Safety Guidelines (DSG) version1 | | Result of a lack of faith in governments to provide guidance and legislation in the foreseeable future | | |

| Period | Event or action | Fatalities | Comment | Gov. Dept. | Legislation |
|----------------------------|--|------------|---|------------|--------------|
| Apr 1996 | NZ Poihipi Reservoir | 0 | | | |
| 11 th Apr 1996 | NZ Poolburn farm irrigation dam | 0 | | | |
| 1 st May 1996 | MOC discussion paper on proposed statutory requirements and procedures | | | | |
| 6 th Feb 1997 | NZ Opuha irrigation dam | 0 | Failed during construction, fatalities narrowly avoided | | |
| 2000 | NZSOLD DSG version 2 | | | | |
| Aug 2004 | Building Act includes specific Dam Safety Assurance clauses | | | BIA | Building Act |
| 2008 | Dam Safety assurance Regulations | | Approved for later implementation | | |
| Aug 2013 | NZ Haldon Farm dam, Seddon | 0 | Dam was damaged in Seddon earthquake. A controlled breach of the dam was undertaken to reduce stored water volume to reduce risk of uncontrolled breach | | |
| 30 th June 2015 | Regulations revoked | | | MBIE | |
| Aug 2015 | NZSOLD DSG version 3 | | Authored to align with regulations in specific areas. Serving as default Regulations | | |
| Sep 2015 | NZ Waihi Dam gate failure | 0 | Severe silting downstream | | |
| 2016 | MfE develops TWG for a National Environmental Standard | | Minister advises that the content of the NES is to be leaner and less costly than the previous Regulations. | MfE | RMAct (NES) |
| 2017 | MfE developed draft discussion document | | Document was not released prior to the 2017 election | | |
| November 2018 | MBIE indicate intention to return to Building Act | | | MBIE | BAct |