What is happening in Canada?
What is happening in Canada?

Overview of Canada – just geography

Overview of dam safety in Canada

BC Dam Safety Reviews vs Part12D

Impacts of 2017 and other events on Dam Safety
Canada is the World’s 2 or 3rd Largest Hydropower producer.
~63% of Canada’s power is hydro.

British Columbia about 14 GW
Yukon 95 MW
Alberta ~943 MW
Saskatchewan about 868 megawatts
Manitoba more than 5 gigawatts
Ontario about a gigawatt
Quebec about 40 gigawatts
New-Brunswick about 950 megawatts
Newfoundland & Labrador about 6.8 gigawatts
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Dam Safety in British Columbia
Dam Safety in British Columbia

Dam Safety Review ≠ Part12D

- Applicable to all dams
- Owners Internal Policies
- BC Dam Safety Regulation B.C. Reg. 40/2016 Water Sustainability Act
- APEGBC* Professional Practice Guidelines 3.0 (pursuant to 40/2016)
- Canadian Dam Association (guidelines & professional practice)
- Other sources such as CEATI, ICOLD, USBR, FERC, Corps of Engineers, USSD.
Know the references, regulations and guidelines.
### Differences - DSR and Part12D

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<tr>
<th>Part12D</th>
<th>DSR</th>
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<td>Federal FERC Independent Consultant approval Described in CFR’s and Guidance PFMA Review of available information, sometimes technical studies.</td>
<td>Varies by Province with strong role of CDA Owner or regulatory Review Engineer selection (using guidance), sometimes internal dam safety review team Multiple guidance or references. Owner’s requirements often exceed regulatory HFMM or FMEA or PFMA, varies, sometimes no FMs process Often includes technical work in addition to review Some less frequent than every 5 years, but more inclusive Emphasis on operations</td>
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Things to like about dam data in Canada

Based on an actual data set.

Piezometer level depth to water 4.13 metres.
Reservoir elevation 5142.3 feet
Flow 4 cms.
Wet well depth to water 8 metres 4 inches.

Sorry Catrin.
Dam Safety Impacts of 2017

What is new in Canada because of Oroville etc.?
Osoyoos
Dam Safety Impacts of 2017 or 2010?

Testalinden Creek – near Osoyoos
Dam Safety Impacts of 2017 or 2014?

Mt. Polley
Dam Safety Impacts of 2017 or 2015?

Samarco, Brazil
How have these examples and Oroville changed Dam Safety in BC (and Canada)?
**BC Hydro:** special spillway inspection and design review program prompted by Oroville.

**Earlier Work (before all this happened)**

Past few years - $64 million Bennett Dam Rehabilitation Work (within past 3 years). Major rehabilitation to concrete.

Since 2005 - $360 million (to date) projects at 10 of 22 sites with gated spillways completed, 2 more underway.
Enormous regulatory effort in BC especially for small dams.

Creation of APEGBC guidance

Update to APEGBC guidance to include tailings dams

Some major dam owners – special inspections and reviews because of Oroville
Some major dam owners – spillway inspection and design reviews program prompted by Oroville.

Oroville incident and report - challenges the status quo.

“Requires all parts of the industry to take an honest look at existing practices and make sure we don’t just keep doing the same thing because it seems to be working.”
End
Most of BC Hydros major spillways have been used in the past year for various reasons, so we're confident they'll work in emergency situations. Some of our larger spillways saw their last major spill about 4½ years ago; these have all been closely inspected following their use, and repaired when required. We've spent about $2 million on general maintenance on the concrete in many of our spillways in this time frame, with another $.5M planned for this coming year.

In addition, we've recently completed a major rehabilitation of the spillway at the Bennett Dam, at a total cost of about $64M, to replace areas of damaged concrete and to provide safe access for the work, and future repairs. We're confident that our spillways are ready when needed, and the concrete damage that occurred at the Oroville main spillway will not happen here.

BC Hydro has flood discharge gate systems (spillway gates) at 22 facilities that are required to operate on demand for dam safety reasons. The Spillway Gate Program was initiated in 2005 to address spillway gate reliability issues across BC Hydro's fleet of 22 facilities with spillway gates.


BC Hydro initiated a major program of reliability upgrades to our spillway gates back in 2005. Projects at