

An Update of the  
International Joint Commission's  
1998 Report, Unsafe Dams?

# Seven Years Later — What Has Changed?

March  
2006

INTERNATIONAL  
JOINT  
COMMISSION  
Canada and United States



COMMISSION  
MIXTE  
INTERNATIONALE  
Canada et États-Unis

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A Report to the Governments of  
the United States and Canada

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## Executive summary

In its 1998 report entitled *Unsafe Dams?* the International Joint Commission (IJC) concluded that the existing situation in which a number of Regulated Facilities<sup>1</sup> at the Canada/U.S. border were not subject to comprehensive government safety inspections and oversight by governments was unsatisfactory. The IJC also concluded that “the prime responsibility for public protection ultimately rests with government”. It recommended that governments oversee the safety of facilities subject to IJC Orders,<sup>2</sup> and put in place suitable arrangements for joint oversight of structures that extend across the border.

After September 11, 2001 in particular, agencies in both countries at the federal, state and provincial level have placed increased emphasis on public safety and emergency preparedness. An overview of current relevant federal, provincial and state programs in Canada and the United States is provided in Appendix 1.

Emergency action plans are now in place for all dams under IJC Orders with the exception of the Prairie Portage, the International Kettle Falls and the Squirrel Falls dams between Ontario and Minnesota in the Rainy basin (see Appendix 2) and steps have been taken to enhance security at these structures. However, the status of regular inspections and oversight by governments has remained largely unchanged in Canada. In 1998, there were no regular inspections by federal or provincial governments in Canada.

Today, apart from some provincial oversight in B.C., there are still no regular inspections by governments in Canada even though Public Safety and Emergency Preparedness Canada considers dams as an element of “public safety” critical infrastructure and critical to a number of sectors depending on their purpose (water, transportation and energy and utilities). Hence, their safety is a crosscutting concern. In contrast, all Regulated Facilities in the United States now have regular government inspections mainly by two U.S. federal government agencies, the Federal Energy Regulatory Commission (FERC) and the Bureau of Reclamation of the U.S. Department of the Interior.

Also Governments have not put in place suitable arrangements for joint oversight of structures that extend across the border (see appendix 2 for a list of these structures). Although the U.S. government now regularly provides a courtesy copy of its findings on the inspection of the U.S. portion of a joint structure to the owner of the Canadian portion of the joint structure, no Canadian governmental framework exists to permit joint governmental information sharing.

The IJC continues to urge the federal and provincial governments in Canada to oversee the safety and security of all facilities in Canada on the border that are regulated by the IJC. As the IJC concluded in its 1998 report, “without government oversight there is no effective means of ensuring accountability for activities that can put the lives and property of Canadian and United States citizens in jeopardy”. The

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<sup>1</sup> Structures such as dams and dykes at the Canada/U.S. border that are subject to IJC Orders

<sup>2</sup> The IJC can be called upon by the Canadian and U.S. governments to approve applications for the construction of structures on rivers or lakes along their boundary. If it approves an application, the IJC issues an Order which sets certain conditions for the operation of the approved structure.

IJC also urges governments to take appropriate steps to ensure the safety and security of structures at the border that are not directly regulated by the IJC.<sup>3</sup> This includes, in particular, structures whose existence is essential to waters under IJC Orders. Examples are the Chippawa-Grass Island Pool Control Structure on the Niagara River and the works related to the apportionment of the waters of the St. Mary and Milk Rivers and their tributaries in the State of Montana and the Provinces of Alberta and Saskatchewan.

The 2005 hurricane season in the U.S. gulf states has demonstrated the importance of emergency preparedness and the oversight role that governments at all levels must play.

The Canadian federal government has in the past stated that the setting of regulations on dams, dam safety and maintenance in Canada, fall within the purview of the provinces. However sections 91, 92 and 132 of the Constitution Act, 1867 (see Appendix 3 for relevant text) suggest that these matters do not fall exclusively under provincial jurisdiction particularly at the international border between Canada and the United States . The Canadian federal government therefore should also play a role in this area where structures are on or cross the Canada/U.S. boundary. This is discussed in greater detail later in this report under "Observations and Conclusions".

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<sup>3</sup> Any facilities along the Canada/U.S. border not approved by IJC are also not regulated by it.

## **1. Background**

In February 1998, the IJC submitted a report entitled "Unsafe Dams?" to the governments of the United States and Canada on the safety of dams and dykes that are directly subject to IJC Orders. Among other things, the IJC concluded that "the existing situation in which some Regulated Facilities (facilities under IJC Orders) at the border are not subject to comprehensive government safety inspections and oversight by governments is unsatisfactory".

The IJC's 1998 report "Unsafe Dams?" covered a range of factors that contribute to the safe operation of dams and dykes that are subject to its Orders. These factors included:

- requirements for comprehensive inspection programs;
- proper maintenance and repairs;
- adequate emergency and security action plans with inundation maps;
- evacuation plans and public awareness programs; and,
- the geography and other features of a watershed that could affect safety.

The report concluded that the prime responsibility for public protection ultimately rests with government. It recommended that governments oversee the safety of facilities at the Canada/U.S. border subject to IJC Orders, and put in place suitable arrangements for joint oversight of structures under IJC Orders that extend across the Canada/U.S border.

## **2. IJC activities arising from the 1998 report**

As a follow-up measure after the release of its February 1998 report, the IJC, in March 1998, wrote to the eight companies owning dams that are subject to IJC Orders but for which regular domestic government inspections and inspection reports were not be available. The IJC asked the companies to provide certificates approved by a resolution of their respective boards of directors, based on the views of independent, recognized experts in dam safety and on a review of the relevant maintenance, operations and emergency action plans, that their structures are maintained and operated safely. The IJC forwarded the information it received, which included certificates in some cases and consulting engineering reports in others, to the governments of Canada and the United States and urged the governments to discuss these matters and to provide a substantive response to the 1998 report as soon as possible.

In September 1998, the IJC hosted a U.S. Army Corps of Engineers briefing on its dam safety program for IJC Commissioners and representatives from the U.S. Department of State and the Canadian Department of Foreign Affairs. A discussion of dam safety with U.S. and Canadian federal government representatives followed at the IJC's semi-annual meeting in October 1998. Canadian government officials asserted the provincial role in this matter and devolution by the provinces of responsibility to dam owners. The U.S. government noted that dam safety would be a topic for discussion by the U.S. federal Interagency Committee on Dam Safety (ICODS) and asked ICODS for assistance in developing a response to the IJC's *Unsafe Dams?* report.



Formal responses to the IJC's report were received from the Governments of Canada and United States in May 1999 and March 2000 respectively.

The Canadian Government reported in May 1999 that "...in Canada, dams fall within the purview of the provinces as do the setting of regulations on dams, dam safety and maintenance. As for federally-owned dams, it is expected that federal government agencies responsible for the operation and maintenance of these dams would comply with the regulations and direction in the province where the dams are located [...] Although provincial governments carefully monitor the design, licensing and regulation of dams, they do not undertake the physical on-site inspection of dams as a matter of course. Dam owners are charged with ensuring the safety of their dams. Emergency action plans are within the purview of individual dam owners as well".

A letter dated November 29, 1999 from the Director of the United States Federal Emergency Management Agency (FEMA)<sup>4</sup> to the Secretary of State and forwarded to the IJC on March 9, 2000 constituted the United States Government's response to the IJC's 1998 report. The letter indicated that all U.S. owned and operated dams on or near the Canadian border are inspected using current regulatory criteria to meet requirements stated by the IJC. However, the letter also indicated the need for further coordination between the United States and Canada with respect to the inspection of portions of dams owned by Canadian entities.

In October 2001, following the September 11, 2001 terrorist attacks in the United States, the IJC asked each of its boards<sup>5</sup> to consider potential security concerns and how they would manage such concerns, and to develop qualitative contingency plans for potential security concerns impacting their responsibilities. The boards indicated that security of facilities was considered to be the responsibility of the owners and emergency plans exist for most facilities (see Appendix 2), but there was likely a need to revisit these plans in view of current concerns. The IJC reported these findings to the U.S. and Canadian federal governments.

In the Spring of 2004, the IJC asked the owners of Regulated Facilities to update information furnished for the 1998 report, including information on safety inspections and emergency action plans, governmental oversight of inspections, inundation maps, security protocols and any other information concerning safety and security. At the same time, the IJC requested the assistance of its boards to provide information on steps that have been taken since 1998 to ensure the safety and security of these structures. Finally the relevant federal, state and provincial government agencies were asked to provide additional information regarding safety, security and governmental oversight of structures listed in the 1998 report. The information received pursuant to these requests as well as information from various other consultations is summarized in the following section and also in Appendices 1 and 2.

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<sup>4</sup> FEMA is an agency of the U.S. federal government tasked with disaster mitigation, preparedness, response and recovery planning.

<sup>5</sup> Some 20 boards, established by the International Joint Commission, assist it in its responsibilities.

### **3. Findings**

#### **a) Safety and security status of facilities at the border regulated by the IJC**

In its 1998 report, the IJC noted that there were good reasons for addressing the safety of Regulated Facilities at that time. Many of them were constructed three or four decades earlier. A failure of one of these dams could have serious if not catastrophic consequences for persons and property in both countries. It stated that although age alone does not determine the useful life of a structure, engineered structures do not last forever. To remain safe, dams require proper inspection, maintenance and repair programs, and the establishment and regular testing of emergency procedures.

Appendix 2, "Regulated Facilities, Inspections and Emergency Planning" at the end of this report, provides information on the current state of safety and security of Regulated Facilities based on information received from governments, IJC boards, and owners and operators of these facilities. Emergency action plans are now in place for all dams<sup>6</sup> under IJC Orders except for three small remote dams in the Rainy Lake basin where even a complete collapse would have only minor impacts and where steps have been taken to enhance security.

#### **b) Safety and security status of facilities at the border not regulated by the IJC**

The IJC's 1998 report provided an overview of existing inspection requirements and procedures followed by governments and owners of facilities or structures at the border that are regulated by the IJC. The 1998 report did not include an exhaustive list of facilities along or crossing the Canada/U.S. border which the IJC does not regulate. This report also does not provide such a list.

However, such structures may affect water levels and flows along the boundary and, hence, affect the ability of the IJC to carry out its responsibilities pursuant to its Orders in these boundary areas. In the IJC's opinion the safety and security of these structures should not be overlooked. Examples of such structures include the Woodland Dam on the St. Croix River at Baileyville, Maine, which straddles the Canada/U.S. border between Maine and New Brunswick, and the Chippawa-Grass Island Pool Control Structure<sup>7</sup> on the Ontario side of the Niagara River at Niagara Falls. There is also the Lake Sherburne Dam and St. Mary Canal on the St. Mary River in Montana at the border between Canada and the United States. Rafferty and Alameda Dams are examples from the Souris River Basin. These are examples of facilities which are not under the authority of the IJC but whose operations are linked to the work of IJC boards. The IJC is concerned that there be appropriate government oversight for these and other similar facilities along the border that are not regulated directly by the Commission.

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<sup>6</sup> Three small dams in the Rainy basin between Ontario and Minnesota including the Prairie Portage Dam, the International Kettle Falls Dam and the Squirrel Falls Dam do not have emergency action plans (see also Appendix 2).

<sup>7</sup> Although the Chippawa-Grass Island Pool Control Structure on the Niagara River is not regulated by the IJC, the Commission's International Niagara Board of Control monitors and provides annual reports to the IJC on the operation of these control works by the power entities, Ontario Power Generation and the New York Power Authority.

#### **4. Government oversight**

As noted in the 1998 report, the United States and Canada have had different approaches to oversight of dam safety. In the United States all facilities regulated by the IJC have regular government inspections mostly by U.S. federal government agencies. Most facilities are either federally owned or are operated and maintained under the supervision of FERC. FERC performs inspections and imposes safety inspection, maintenance and emergency planning requirements. U.S. federal inspections of other structures on the border are performed by the U.S. Army Corps of Engineers, the Bureau of Reclamation of the U.S. Department of the Interior, and the U.S. Department of Agriculture. In addition, state agencies in Maine, Minnesota and Washington also carry out inspections of certain structures on the border (see Appendix 2).

A summary of the ownership and oversight of Regulated Facilities in the United States and changes that have occurred since 1998 is provided in Table 1. In 1998, there were regular government inspections of all structures on the U.S. side directly subject to IJC Orders except the Grand Falls and Milltown dams on the St. Croix River and the International Kettle Falls Dam at the outlet of Namakan Lake in the Rainy basin. These now have government inspections as well.

In Canada none of the structures listed in this report as being subject to IJC Orders are owned or operated by the Government of Canada. Of the fourteen regulated structures listed in Table 2 of this report, two are owned by New Brunswick Power, one by Ontario Power Generation and the remaining eleven are privately owned. In 1998 the IJC reported that the Canadian Government had not enacted and implemented a dam safety and security program for Regulated facilities on the boundary, and that these facilities were not subject to regular provincial inspections. It is apparent from Table 2, which shows the ownership and oversight of Regulated Facilities in Canada, that this situation is unchanged apart from some provincial oversight in B.C.

**Table 1: Ownership and regular government inspection of regulated facilities in the United States**

Regulated facilities	Ownership		Regular inspections by governments in the U.S.	
	1998	2005	1998	2005
Forest City Dam (U.S. portion)	Georgia-Pacific Corporation	Domtar	Federal Energy Regulatory Commission (FERC)	FERC
Vanceboro Dam (U.S. portion)	Georgia-Pacific Corporation	Domtar	FERC	FERC
Grand Falls Dam (St. Croix River) (U.S. portion)	Georgia-Pacific Corporation	Domtar	None	Maine Emergency Management Agency (MEMA)
Milltown Dam (U.S. portion)	New Brunswick Power	New Brunswick Power	None	MEMA
St. Lawrence-FDR Power Project, Long Sault Spillway Dams and Iroquois Dam in the United States	New York Power Authority	New York Power Authority	FERC	FERC
Compensating Works (U.S. portion) at Sault Ste. Marie	U.S. Army Corps of Engineers	U.S. Army Corps of Engineers	U.S. Army Corps of Engineers	U.S. Army Corps of Engineers
Prairie Portage Dam (U.S. Portion)	U.S. Department of Agriculture, Forest Service	U.S. Department of Agriculture, Forest Service	U.S. Department of Agriculture, Forest Service	U.S. Department of Agriculture, Forest Service
International Kettle Falls Dam (U.S. portion)	Boise Cascade Corporation	Boise Cascade Corporation	None	Minnesota Department of Natural Resources
Fort Frances-International Falls Dam (U.S. portion)	Boise Cascade Corporation	Boise Cascade Corporation	FERC	FERC
Grand Coulee Dam	U.S. Bureau of Reclamation	U.S. Bureau of Reclamation	U.S. Bureau of Reclamation	U.S. Bureau of Reclamation
Osoyoos Lake Control Structure (Zosel Dam)	State of Washington	State of Washington	State of Washington, Department of Ecology	State of Washington, Department of Ecology

**Table 2: Ownership and regular government inspection of regulated facilities in Canada**

Regulated facilities	Ownership		Regular inspections by governments in Canada	
	1998	2005	1998	2005
Forest City Dam (Canadian portion) - St. Croix River	Georgia-Pacific Corporation	Domtar	None	None
Vanceboro Dam (Canadian portion) - St. Croix River	Georgia-Pacific Corporation	Domtar	None	None
Grand Falls Dam (Canadian portion) - St. Croix River	Georgia-Pacific Corporation	Domtar	None	None
Milltown Dam (Canadian portion) - St. Croix River	New Brunswick Power	New Brunswick Power	None	None
Grand Falls Dam Saint John River	New Brunswick Power	New Brunswick Power	None	None
Saunders Generating Station, Cornwall Dyke, ice booms and Iroquois Dam - St. Lawrence River in Canada	Ontario Hydro	Ontario Power Generation	None	None
Lake Erie-Niagara River Ice Boom (Canadian portion) - Niagara River	Ontario Hydro	Ontario Power Generation	None	None
Compensating Works (Canadian portion) at Sault Ste. Marie - St. Marys River	Great Lakes Power	Great Lakes Power	None	None
Great Lakes Power Canal and Clergue Hydropower Plant - St. Marys River	Great Lakes Power	Great Lakes Power	None	None
Prairie Portage Dam (Canadian Portion) -	U.S. Department of Agriculture, Forest Service	U.S. Department of Agriculture, Forest Service	None	None
Kettle Falls (Squirrel Falls) Dam - Rainy basin	Abitibi-Consoldated Inc.	Abitibi-Consoldated Inc	None	None
International Kettle Falls Dam (Canadian portion) - Rainy basin	Abitibi-Consoldated Inc	Abitibi-Consoldated Inc	None	None
Fort Frances-International Falls Dam (Canadian	Abitibi-Consoldated Inc	Abitibi-Consoldated Inc	None	None

portion) - Rainy basin				
Kootenay River Dykes in Canada - Kootenay River	Individual Landowners	Dyking authorities under the Dyke Maintenance Act (amended 2003)	None	Inspections by Dyking authorities under the Dyke Maintenance Act
Corra Linn Dam - Kootenay River	West Kootenay Power	Fortis B.C.	None	Oversight by British Columbia through Land and Water B.C. Inc.
Waneta Dam - Pend d'Oreille River	Cominco Ltd.	Teck Cominco	None	Oversight by British Columbia through Land and Water B.C. Inc.

## 5. Observations and conclusions

Information for 1998 and 2005 on government inspections of regulated facilities in Canada and the United States is provided in Tables 1 and 2. A comparison of the information in these tables indicates that in Canada neither the Canadian government nor any of the provincial governments with the exception of British Columbia have fully implemented the recommendation in the IJC's 1998 report that federal and provincial governments in Canada oversee the safety of facilities on the Canadian side of the border that are regulated by the IJC. A different situation exists in the U.S. where the practice of regular inspections mainly by U.S. federal agencies, noted in 1998, has continued.

The IJC concluded in its 1998 report that without government oversight there is no effective means of ensuring accountability for activities that can put the lives and property of Canadian and United States citizens in jeopardy.

The 2005 hurricane season in the U.S. gulf states has demonstrated the importance of emergency preparedness and the oversight role of key infrastructure that governments at all levels must play.

The Canadian federal government has in the past stated that the setting of regulations on dams, dam safety and maintenance in Canada, fall within the purview of the provinces. However sections 91, 92 and 132 of the Constitution Act, 1867 (see Appendix 3 for text) suggest that these matters do not fall exclusively under provincial jurisdiction particularly at the international border between Canada and the United States. The Canadian federal government therefore should also play a role in this area where structures are on or cross the Canada/U.S. boundary. Section

91 gives the federal government authority to make laws for peace, order, and good government, including public safety, and specifically for defence, navigation and shipping, and works extending beyond the limits of a province. Under section 132, the federal government has authority to implement Empire Treaties,<sup>8</sup> such as the Boundary Waters Treaty of 1909 under which many of these dams have been approved by the IJC whose approval orders set up ongoing control entities. The federal government is also responsible for the conduct of Canada's international relations including those with the United States.

The guidelines and best practices for dam safety developed by the Canadian Dam Association (CDA) are voluntary and cannot take the place of rigorous government oversight.

The IJC has not been given and does not have the expertise and resources required to oversee the safety and security of dams and other structures that it regulates for the purpose of controlling water levels and flows.

Within the U.S., all facilities under IJC Orders are subject to government safety inspections and oversight mainly by the Federal government but also in a few cases by state governments. Within the U.S., resource limitations associated with inspections conducted by state agencies at the few facilities inspected by states under IJC Orders, result in inspections that are not conducted at evenly distributed time intervals and of adequate frequency in time. Therefore, more U.S. federal funding needs to be provided to Maine and Minnesota to increase the frequency of time between inspections.

It appears from Tables 1 & 2 and Appendix 2 that some improvements have been made on both sides of the border since 1998 for the safety and security of Regulated Structures.

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<sup>8</sup> As stated by Peter W. Hogg on page 298 of the fourth edition of Constitutional Law of Canada, section 132 of the *Constitution Act, 1867* grants to the federal Parliament the power to enact legislation which is necessary to implement treaties between the "British Empire" and foreign countries, such as the *Boundary Waters Treaty* of 1909.

In 1867, the conduct of international affairs for the entire Empire was still vested in the British (imperial) government, and it was the British government which in 1909 negotiated, signed and ratified all treaties which applied to the Empire or any part of the Empire.

Although the *Constitution Act, 1867* contemplated the performance only of "Empire" treaties, by 1926 Canada had evolved from the status of a colony to that of a fully independent member of the international community, and the imperial conference of 1926 recognized Canada's power to negotiate, sign and ratify treaties on its own behalf.

## 6. Recommendations

The IJC recommends that the Canadian government expedite the development and implement its National Strategy for Critical Infrastructure Protection<sup>9</sup> to ensure that adequate oversight arrangements, led by the federal government, are in place similar to what now exists on the U.S. side.

The IJC recommends that governments take appropriate steps to ensure the safety and security of facilities at the border that are not regulated by the IJC.<sup>10</sup>

The IJC recommends that more U.S. federal funding needs to be provided to Maine and Minnesota to increase the frequency of inspections.

The IJC repeats its 1998 recommendation that Governments put in place suitable arrangements for joint oversight of structures that extend across the border.

Signed this third day of March, 2006.



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Chair, Canadian Section



Dennis L. Schornack  
Chair, U.S. Section



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Irene B. Brooks  
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Jack P. Blaney  
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<sup>9</sup> See PSEPC website at <http://www.ocipep.gc.ca> for further information.

<sup>10</sup> See discussion of this in section 3b) of this report.





## **APPENDIX 1**

### **RELEVANT GOVERNMENT PROGRAMS**

#### **Canada**

Regular inspections of Regulated Facilities by governments in Canada are absent except for B.C. However a number of federal and provincial agencies have relevant responsibilities related to public safety and emergency preparedness.

At the federal level, Public Safety and Emergency Preparedness Canada (PSEPC) says it was created in 2003 to fulfill the fundamental role of the Government of Canada to secure the public's safety and security and is dedicated to minimizing a continuum of risks to Canadians.

The Energy Infrastructure Protection Division of Natural Resources Canada says it promotes initiatives to strengthen the protection of Canada's critical energy infrastructure.

The roles and responsibilities of these agencies as well as those of various provincial agencies are described in the following sections.

#### **1. FEDERAL PROGRAMS**

##### **Public Safety and Emergency Preparedness Canada (PSEPC)**

PSEPC says that none of the structures listed in the 1998 report as being subject to IJC Orders are owned or operated by the Government of Canada. It says the setting of regulations on dams, dam safety and maintenance fall within the purview of the provinces and practices vary from province to province. According to PSEPC, many jurisdictions in Canada seek, as a matter of policy, to encourage and support self-regulation as a viable, trustworthy and cost-effective method of maintaining a high level of safety and security.

However, PSEPC says it is advancing awareness of vulnerabilities and the adoption of corresponding protective measures by critical infrastructure owners and operators in 10 key sectors under the National Critical Infrastructure Assurance Program (NCIAP).<sup>11</sup> Dams are included in this program as an element of the "public safety" critical infrastructure. PSEPC says they can be critical to a number of sectors depending on their purpose (water, transportation and energy and utilities); hence, their safety is a crosscutting concern.

Another research and development venture of PSEPC is the Joint Infrastructures Interdependencies Research Program (JIIRP), co-hosted by PSEPC and the Natural Science and Engineering Research Council, to produce new science-based knowledge and practices to better assess, manage, and mitigate risks to Canadians from failures related to critical infrastructure dependencies.

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<sup>11</sup> See PSEPC website at <http://www.ociepc.gc.ca> for further information.

PSEPC says that extensive incremental resources have been allocated by the federal government since 2001 to upgrade Canada's capacity to collect and analyze intelligence. This involves increased personnel, improved interagency and international information exchange, and multi-disciplinary analysis through a new federal Integrated Threat Assessment Centre.

Finally, PSEPC says it is developing a national critical infrastructure protection strategy in cooperation with the Provinces and other Federal departments. A Government of Canada Position Paper on a National Strategy for Critical Infrastructure Protection presenting the Government of Canada's position on the development of a comprehensive national approach to critical infrastructure protection has been circulated to elicit feedback from stakeholder groups and to form the basis of a national strategy for critical infrastructure protection.

### **Natural Resources Canada (NRCan)**

Following the tragic events of September 11, 2001, the Energy Infrastructure Protection Division<sup>12</sup> of NRCan was established to promote initiatives to strengthen the protection of Canada's critical energy infrastructure against terrorist attacks and natural hazards.

To meet these challenges, Canada and the U.S. signed the Smart Border Declaration (SBD)<sup>13</sup> in December 2001, committing both countries to work jointly in implementing a 30-point action plan to identify and address security issues while expediting the legitimate flow of people and goods across the shared border. Under Action Plan Item #21 of the SBD, Canada and the U.S. committed to "conducting bi-national threat assessments on trans-border infrastructure to identify necessary protection measures, and initiate assessments for transportation networks and other critical infrastructures".

In 2004, NRCan and the U.S. Departments of Energy and Homeland Security<sup>14</sup> completed a bilateral pilot vulnerability assessment of energy facilities and systems at the Niagara Falls Sir Adam Beck Generating Station and the International Control Dam (Chippawa-Grass Island Pool) on the Niagara River.

In 2005, NRCan, in consultation with provincial and private sector owners in New Brunswick, Ontario and British Columbia, compiled a listing of potentially critical hydroelectric dams for planned vulnerability assessments. These include most of the dams under IJC Orders.

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<sup>12</sup> The Energy Infrastructure Protection Division develops policies, legislation and regulations to promote initiatives to strengthen the protection of Canada's critical energy infrastructure through close collaboration with other federal departments, provincial governments, regulatory agencies, the energy industry, energy associations and academia. It carries out, in partnership with NRCan's laboratories, scientific analysis and modeling and alert notification processes to enhance the protection of critical energy infrastructure. It provides expert advice and program support to Public Safety and Emergency Preparedness Canada in formulating the National Critical Infrastructure Assurance Strategy. Internationally, it is engaged with the U.S. on issues relating to cross-border energy infrastructure protection, information sharing, and contributing to the stated goal of Canada, the U.S. and Mexico in strengthening North American security, prosperity, and quality of life.

<sup>13</sup> The Smart Border Declaration is an action plan for creating a secure and smart border between Canada and the U.S. The plan is based on four pillars: (i) secure infrastructure; (ii) secure flow of people; (iii) secure flow of goods; and (iv) information sharing and coordination. Action Item #21 of the plan specifically deals with the protection of critical infrastructure.

<sup>14</sup> The U.S. Department of Homeland Security is a federal agency whose primary mission is to help prevent, protect against, and respond to acts of terrorism on U.S. soil.

That same year, NRCan conducted vulnerability assessments on New Brunswick Power's Grand Falls (St. John River) and Milltown (St. Croix River) hydroelectric dam facilities and provided feedback to the owners.

In addition to the vulnerability assessments, NRCan hosted a security workshop with the Canadian Dam Association (CDA)<sup>15</sup> in April 2004. Subsequently, the CDA included security as a principle to be incorporated into any revision of the CDA Dam Safety Guidelines.<sup>16</sup> NRCan has committed to working in partnership with the CDA to promote security considerations in dam safety programs. While the guidelines are not obligatory, they form the basis for most dam safety administration in Canada.

## **2. PROVINCIAL PROGRAMS**

This discussion is limited to the provinces of New Brunswick, Ontario and British Columbia where Regulated Facilities are located.

### **New Brunswick**

Under the 1989 Clean Water Act, a ministerial permit is required for the construction of any dam in New Brunswick and the Minister may impose such terms and conditions considered appropriate. Among other things, the Act states the owner of a project or structure shall ensure that all the original specifications of the project or structure and any terms and conditions imposed on any permit are met and the project or structure is maintained in good repair. While the Act also states that the Minister may at any time order an inspection, of any project, it appears that dams in New Brunswick are not subject to governmental licensing or legislated safety inspections and that dam owners are charged with ensuring the safety of their dams.

As part of the NB Critical Infrastructure Protection Program, all dams are assigned a criticality classification and will be subjected to an all-hazards Threat, Risk and Vulnerability Assessment, based on standardized criticality criteria.

NB Power has in place a formal dam inspection program that consists of an annual inspection of all NB Power hydroelectric facilities, including the Milltown and Grand Falls Generating Stations. This is a voluntary program carried out by the Corporation to ensure the safe operation of these facilities. Every four years an external consultant with expertise in hydro developments conducts an independent evaluation of all NB Power hydroelectric facilities.

### **Ontario**

Facilities regulated by the IJC at the border in Ontario are operated and maintained by Ontario Power Generation Inc., Great Lakes Power and Abitibi Consolidated Inc.,

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<sup>15</sup> The CDA is a non-government organization that advances the implementation of practices to ensure the safe operation of dams in Canada. In addition to public safety considerations and protection of the environment, it provides a forum for the exchange of ideas and experiences in the field of dam safety.

<sup>16</sup> The Dam Safety Guidelines (which are voluntary) define the requirements and outline guidelines so that the safety of existing dams can be evaluated in a consistent and adequate manner across Canada, and new dams can be designed and constructed to be safe; enable the consistent evaluation of dam safety deficiencies leading to the construction of improvements which contribute to dam safety and to provide a basis for dam safety legislation and regulation.

and Ontario says the safety of the structures is the owner's responsibility. Ontario says it has not formally enacted a dam safety program but has relied on self-regulation, which expects that owners of dams possess the necessary expertise, experience and resources to ensure dams are maintained to acceptable safety standards and owners discharge their responsibilities related to dam safety.

The Ontario Ministry of Natural Resources (MNR) has the mandate under the Lakes and Rivers Improvement Act to ensure that dams in the province are managed safely. It says that regulatory enhancements that are being developed for consideration include policies and standards to form a comprehensive dam safety program, with the intention that the regulation and standards be applied to both private and public dams. In addition, the above regulation is intended to include requirements for addressing public safety around dams. MNR staff is also evaluating options on how the program would be administered, through self-regulation and audit, government oversight, or a combination thereof.

In the meantime, MNR says it is in the process of updating the Technical Guidelines - Criteria and Standards for Approval under the Lakes and Rivers Improvement Act. MNR says it anticipates that these Technical Guidelines will be formalized and subsequently used internally by the MNR for review and approval of new dams and improvements to existing dams.

While the Act states the Minister may, at any time, order an in-depth inspection of a dam, there is no legislated requirement to carry out periodic dam safety reviews. Discussions between the Federal Energy Regulatory Commission (FERC) in the United States and the MNR, Regional Engineering Services of Northwest Region, led to a joint inspection of the water control structures at the outlet to Rainy Lake in the spring of 2005.

### **British Columbia**

Since the publication of the IJC's "Unsafe Dams" report, B.C. has enacted the "British Columbia Dam Safety Regulation" (B.C. Reg. 44/2000) dated February 10, 2000. This regulation was made pursuant to the B.C. Water Act.

In general, the regulation sets out a set of requirements, which dam owners must meet, based on the possible consequences should that dam fail. The requirements for High and Very High Consequence Dams include: formal inspections and repair of any safety deficiency found; production of Operation, Maintenance, and Surveillance (OMS) Manuals; preparation of Emergency Preparedness Plans (EPP); and periodic in depth Dam Safety Reviews. Low Consequence Dams require formal inspections and OMS manuals. Very Low Consequence Dams require formal inspections.

Through Land and Water British Columbia Inc., a crown corporation, the government of British Columbia says it provides oversight and compliance confirmation of dam owners by requesting annual confirmation of formal inspections, and status of OMS Manuals, EPP's, and Dam Safety Reviews for all the High and Very High Consequence Dams.

In addition to the annual compliance confirmation, British Columbia says that audits are carried out on the High and Very High Consequence Dams at a minimum of once every five years and on the Low and Very Low Consequence Dams every 10 years. Based on compliance information, audits and other information that may be available

to the Dam Safety Officer,<sup>17</sup> attention is focused on any potentially unsafe dams through the use of a risk based process. This may result in follow-up site inspections, dam owner assistance, and if needed, an Order may be issued under the Water Act, to help remedy a situation. Failure to comply with an Order could lead to fines under the Water Act, cancellation of the Water License and/or the Province having the work done or the dam removed and charging the costs back to the owner.

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<sup>17</sup> The dam safety officer is an engineer or officer who is designated in writing by the comptroller as a dam safety officer. Dam owners submit compliance information, audits and other information to the dam safety officer.

## United States

Government programs in the United States related to the safety and security of Regulated Structures on the U.S. side of the Canada/U.S. boundary involve primarily those of the Federal Energy Regulatory Commission and the Bureau of Reclamation. The U.S. Army Corps of Engineers, the Federal Emergency Management Agency and the Department of Agriculture programs are also involved with certain structures.

### 1. FEDERAL PROGRAMS

#### Federal Energy Regulatory Commission

The U.S. Federal Energy Regulatory Commission or FERC states that it regulates and oversees energy industries in the economic, environmental, and safety interests of the American public. FERC is an independent agency that regulates the interstate transmission of electricity, natural gas, and oil. FERC also reviews proposals to build liquefied natural gas (LNG) terminals and interstate natural gas pipelines as well as licensing hydropower projects.

The FERC states that during the year 2000, preparations for some important programmatic changes to the Dam Safety Program were undertaken, as most of the structural analyses and dam safety remediations were either completed or in the design and construction phases of the program. Within the U.S., this program applies to all facilities FERC regulates, including some that are also under IJC Orders. The Dam Safety Program has been transitioning, it says, to incorporate additional features to improve certainty that, as the dams and associated features age, performance monitoring properly occurs so dams are maintained in safe operating conditions. In addition, FERC says since September 2001, its Emergency Action Plan Program has been reviewed, and it has further developed the dam safety security aspects of that program.

The FERC says that several important program improvements have been undertaken in three main areas: Dam Safety Performance Monitoring Program and Potential Failure Modes Analyses, Emergency Action Plan (EAP), and Security and Critical Energy Infrastructure Information.

**Dam Safety Performance Monitoring Program and Potential Failure Modes Analyses:** Efforts were undertaken in 2001 to update Engineering Guidelines to incorporate Potential Failure Modes Analysis (PFMA) methodologies into the existing program. This Dam Safety Performance Monitoring Program began in 2002 with the pilot in 2002 and full implementation in 2003. In brief, this process brings together all individuals responsible for the safety of the dam in a round-table type setting to brainstorm all potential failure modes for the particular dam. It prioritizes which potential failure modes are most likely to occur, and which would have the most severe consequences. With this in mind, existing monitoring and instrumentation programs are then evaluated for adequacy consistent with the Federal Energy Regulatory Commission engineering guideline on instrumentation, instrumentation monitoring and reporting. In addition, where dam safety deficiencies are identified, risk reduction measures are developed.

The FERC stated that much information about the dams that had been previously overlooked or sources not considered under traditional methodologies has come to

light. Monitoring and instrumentation programs have become more efficient (and more cost effective), as they become more focused as a result of this improved process.

**Emergency Action Plan (EAP):** The FERC stated that all licensees, regardless of the number of dams owned, are required to conduct a Table Top and Functional Exercise of one Emergency Action Plan every 5 years. In response to a call for more exercises by the local emergency services coordinators, the need for a sharing of resources, and the recognition some basins were not being tested even once every 5 years, FERC, Division of Dam Safety and Inspections has requested plans from the larger licensees to ensure every basin is tested at least once every 5 years.

**Security and Critical Energy Infrastructure Information:** As a result of the tragedy of September 11, 2001, the FERC stated it recognized the need to limit access to and information about critical energy infrastructure. It was abundantly clear, it says, that misuse or access by individuals choosing to do harm had the potential consequences of loss of life, loss of the resource and disruption of service. With regards to access to information, procedures have been taken: track who was requesting the information, determine if a valid need existed for the release of this information, and determine if the release of this information was appropriate. This process was formalized in February 2003.

FERC, Division of Dam Safety and Inspections security measures at the dam site requirements were also set by early 2002 for the completion of security plans, security assessments, and, in some cases, vulnerability assessments at all regulated projects.

### **Bureau of Reclamation**

The Bureau of Reclamation of the U.S. Department of the Interior says its mission is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. Reclamation's Dam Safety Program provides for ongoing periodic examinations, visual and instrumented monitoring of performance, identification and evaluation of dam safety issues, and modifications of dams to address unacceptable risks at all of its dams located in the 17 western states of the U.S. (including Grand Coulee Dam which is under an IJC Order). Formal examinations are conducted annually by Reclamation staff at the local level, while more detailed examinations are performed by Reclamation's Regional Offices and Technical Service Center staff on 3- and 6- year intervals, respectively.

Following the attacks on September 11, 2001, the Bureau of Reclamation stated it was committed to establishing a comprehensive and sustainable security program. It says that its security program now integrates physical, personnel, information and operations security into one program. Based on the new threat potential, Reclamation is completing comprehensive integrated security risk assessments based on threat, vulnerability and consequences. These assessments are ongoing and mitigation for unacceptable risks is in progress based on available funding. Background checks are now performed on employees based on position sensitivity, and guidance is in place for identifying and protecting sensitive information. Reclamation is coordinating closely with the Department of Homeland Security and other Federal water and management agencies on the protection of dams, power plants, and appurtenant facilities.



## **U.S. Army Corps of Engineers**

The United States Army Corps of Engineers (U.S.ACE) is made up of approximately 34,600 civilian and 650 military members. Its military and civilian engineers, scientists and other specialists work hand in hand as leaders in engineering and environmental matters. Following the attacks on September 11, 2001, the Corps has increased the surveillance and security of all its facilities at Sault Ste. Marie, including the Compensating Works under IJC orders. Emergency action plans and exercises are being updated and conducted, respectively. Further exercises are planned to increase the security posture of the U.S. Government facilities. The U.S. portion of the Compensating Works continues to be inspected regularly in accordance with Corps of Engineers' Regulations.

## **Federal Emergency Management Agency**

The U.S. federal Dam Safety and Security Act of 2002, which was signed into law on December 2, 2002, addresses safety and security for dams through the coordination by the Federal Emergency Management Agency (FEMA)<sup>18</sup> of federal programs and initiatives for dams and the transfer of federal best practices in dam security to the states. The Act of 2002 includes resources for the development and maintenance of a national dam safety information network and the development by the National Dam Safety Review Board of a strategic plan that establishes goals, priorities, and target dates to improve the safety and security of dams in the United States.

The purpose of the legislation is to reduce the risks to life and property from dam failure in the United States through the establishment and maintenance of an effective national dam safety program to bring together the expertise and resources of the Federal and non-Federal communities in achieving national dam safety hazard reduction. It is not to preempt any other Federal or State authorities, nor is it the intention to mandate State participation in the grant assistance program established under this section.

The Act of 2002 continues all of the programs established by the Water Resources and Development Act of 1996 that have been serving to increase the safety of the Nation's dams including: increased funding authority to support dam safety program improvements that regulate 90 percent of the 78,000 dams in the United States; the work of the Interagency Committee on Dam Safety (ICODS), and the strategic plan development and biennial report on the National Dam Safety Program; training for state dam safety staff and inspectors; a continued program of technical and archival research, including the development of devices for the continued monitoring of the safety of dams; and increased reliance on the National Dam Safety Review Board. This Board provides the Director of FEMA with advice on national policy issues affecting dam safety and helps oversee the operation of state dam safety programs.

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<sup>18</sup> Now with Homeland Security

## **2. STATE PROGRAMS**

Only states with regulated structures are mentioned here.

### **Maine**

Maine Emergency Management Agency (MEMA), Dam Safety Program (MEDSP). MEMA states that since 1998, the Maine Dam Safety Program has employed a State Dam Inspector to evaluate 328 dams every four years, including 36 high hazard (H) dams, 57 significant hazard dams, 170 low hazard dams, and 56 minor dams. The MEDSP maintains files on 1077 dams (841 are the responsibility of the State of Maine; 174 are the responsibility of FERC). In addition to dam condition inspections, the MEDSP is responsible for facilitating and maintaining Emergency Action Plans (EAPs) for 113 high and significant hazard state dams and keeping and updating EAPs for forty-six FERC dams. MEMA is not required to inspect FERC-regulated dams, such as Vanceboro and Forest City, but the MEMA inspects Milltown and Grand Falls Dams; however, resource limitations restrict the agency from conducting inspections at regular intervals.

### **Minnesota**

Minnesota, Department of Natural Resources, Dam Safety Program. Minnesota's Dam Safety Program was created in 1978 in response to the federal Dam Safety Act. The Dam Safety Program regulates the repair, operation, design, construction, and removal of dams. Both privately and publicly owned dams are regulated. The program sets minimum standards for dams regarding safety, design, construction, and operation that are implemented through inspections, permitting, and correcting deficiencies. Dams designated as High Hazard are inspected annually and lower hazard dams are inspected less frequently by DNR dam safety engineers. High hazard dams have emergency action plans, which need to be monitored and revised as necessary on a periodic basis. Minnesota Department of Natural Resources conducts inspections on the U.S. portion of one dam having IJC Orders, The International Kettle Falls Dam located at Rainy Lake.

### **Washington**

State of Washington Department of Ecology, Dam Safety Office. Under state law, the Department of Ecology is responsible for regulating dams that capture and store at least 10 acre-feet (about 3.2 million gallons) of water or watery materials such as mine tailings, sewage and manure waste, totaling about 870 dams across the state. Through plan reviews and construction inspections, the agency helps ensure these facilities are properly designed and constructed. To reasonably secure the safety of human life and property, the Dam Safety Office also conducts inspections of existing dams to assure proper operation and maintenance. The Washington Department of Ecology, Dam Safety Office conducts annual inspections of one dam having an IJC Order - the Zosel Dam at the outlet of Osoyoos Lake.



## APPENDIX 2

### IJC-REGULATED FACILITIES, INSPECTIONS, EMERGENCY PLANNING AND INUNDATION MAPPING

Structure/ Location	Year of IJC Order	Owner/Year of construction or re- construction	Regular government inspections	Non- government inspections	Emergency action plan	Inundation mapping
Forest City dam/St. Croix River	1965	Domtar/1906	Although this structure is located partly in Canada and partly in the United States, the U.S. Federal Energy Regulatory Commission (FERC) performs an independent inspection of the whole dam every year and requires an independent inspection every five years. As part of the NB Critical Infrastructure Protection Program, this dam will be subjected to an all-hazards threat, risk and vulnerability assessment, based on its criticality classification.	Daily staff visits. Remote monitoring of water levels and stream flow via telemetry. Consultant inspections as needed.	Yes	Yes
Vanceboro dam/ St. Croix River	1965	Domtar/1967	Although this structure is located partly in Canada and partly in the United States, FERC performs an independent inspection of the whole dam every year and requires an independent inspection every five years. As part of the NB Critical Infrastructure Protection Program, this dam will be subjected to an all-hazards threat, risk and vulnerability assessment, based on its criticality classification.	Daily staff visits. Remote monitoring of water levels and stream flow via telemetry. Consultant inspections as needed.	Yes	Yes
Grand Lake dam/ St. Croix River	1915	Domtar/1915	The structure is located partly in Canada and partly in the United States. There is no FERC license. Maine Emergency Management Agency (MEMA) inspects the U.S. portion of this structure, and the next inspection is scheduled for summer 2006. Inspections are not conducted at regular intervals. As part of the NB	Daily staff visits. Remote monitoring of water levels via telemetry. Consultant inspections as needed.	Yes	No

Structure/ Location	Year of IJC Order	Owner/Year of construction or re- construction	Regular government inspections	Non- government inspections	Emergency action plan	Inundation mapping
			Critical Infrastructure Protection Program, this dam will be subjected to an all-hazards threat, risk and vulnerability assessment, based on its criticality classification.			
Milltown dam/ St. Croix River	1934	NB Power/ 1934	The structure is located partly in Canada and partly in the United States. As part of the NB Critical Infrastructure Protection Program, this dam will be subjected to an all-hazards threat, risk and vulnerability assessment, based on its criticality classification. N.B Power monitors and audits operation of the dam. The province does not have regulatory oversight through another separate agency. MEMA inspects the U.S. portion of this structure, and the next inspection is scheduled for summer 2006. Inspections are not conducted at regular intervals.	Annual visual inspections by NB Power; Inspection every 4 years by an external consultant	Yes	No
Grand Falls Dam/ Saint John River	1926	NB Power/ 1930	This structure is only located in Canada. As part of the NB Critical Infrastructure Protection Program, this dam will be subjected to an all-hazards threat, risk and vulnerability assessment, based on its criticality classification. N.B. Power monitors and audits operation of the dam. The province does not have regulatory oversight through another separate agency.	Annual visual inspections by NB Power Inspection every 4 years by an external consultant	Yes	No
Robert Moses Power Dam, Long Sault Spillway Dam, Massena Intake Dam, Iroquois Dam, dykes and ice booms in the United States/St. Lawrence River	1952	New York Power Authority (NYPA)/1960	FERC performs an annual inspection and requires an independent inspection every five years on the U.S. side.	NYPA and OPG share the maintenance, inspections and monitoring of the St. Lawrence facilities and carry out this mission primarily through coordination of operations	Yes	Yes

Structure/ Location	Year of IJC Order	Owner/Year of construction or re- construction	Regular government inspections	Non- government inspections	Emergency action plan	Inundation mapping
				and through Joint Works Committees for the St. Lawrence River Power Project. The committees meet regularly to plan and schedule maintenance for both U.S. and Canadian facilities. NYPA and OPG also hold periodic technical meetings on dam safety, instrumentation monitoring, emergency action planning and security.		
R.H. Saunders GS – Main Dam and Cornwall Dyke  St. Lawrence River	1952	OPG (1958)	There are no federal or formal provincial dam safety regulations governing OPG's structures under IJC jurisdiction and there are no inspections by Canadian or Ontario governments on the Canadian side. Ontario has advised owners that the safety of structures is their responsibility and relies on self-regulation by owners.	The R.H. Saunders Main Dam and Cornwall Dyke is inspected, operated and maintained in accordance with OPG's standards and procedures and in compliance with all regulations, including the Ontario Lakes and Rivers Improvement Act and dam safety guidelines established by the Canadian Dam Association.  Dam surveillance inspections take place on a monthly basis (weather permitting), with inspections carried out by Professional Engineers on	Yes	Yes

Structure/ Location	Year of IJC Order	Owner/Year of construction or re- construction	Regular government inspections	Non- government inspections	Emergency action plan	Inundation mapping
				an annual basis. Design reviews, including inspections and a review of the classification take place every 5 years.		
Iroquois Control Dam  St. Lawrence River	1952	OPG/NYPA (1957)	The Iroquois Control Dam is located partly in Canada and partly in the United States. It is owned jointly by OPG and NYPA. OPG operates and maintains the structure. FERC inspects the whole of Iroquois Control Dam, including the portion in Canada. There is no government oversight by Canada.	The International Control Dam is inspected, operated and maintained in accordance with OPG's standards and procedures and in compliance with all regulations, including the Ontario Lakes and Rivers Improvement Act and dam safety guidelines established by the Canadian Dam Association.  Dam surveillance inspections take place on an annual basis at the dam, with inspections carried out by Professional Engineers on a 3 year cycle. Design reviews, including inspections and a review of the classification take place every 10 years.	Yes	No
St. Lawrence River Ice Boom  St. Lawrence River	1952	OPG/NYPA (1958)	There are no federal or formal provincial safety regulations governing OPG's Ice Boom structures under IJC jurisdiction and there are no inspections by Canadian or Ontario governments. Ontario has advised owners that	OPG and the NYPA undertake inspections and repairs as required.	No	Not applicable

Structure/ Location	Year of IJC Order	Owner/Year of construction or re- construction	Regular government inspections	Non- government inspections	Emergency action plan	Inundation mapping
			the safety of structures is their responsibility and relies on self-regulation by owners.			
Lake Erie – Niagara River Ice Boom  Lake Erie/ Niagara River	1964	OPG/NYPA (first installed 1965)	There are no federal or formal provincial dam safety regulations governing OPG's structures under IJC jurisdiction and there are no inspections by Canadian or Ontario governments. Ontario has advised owners that the safety of structures is their responsibility and relies on self-regulation by owners.	OPG and the NYPA undertake inspections and repairs as required.	No	Not applicable
Compensating Works at Sault Ste. Marie (Canadian portion) / St. Marys River	1914	Great Lakes Power (GLP) Limited (owner) Brascan Power Corporation (operator) /1921	There are no inspections by Canadian or Ontario governments. Ontario has advised owners that the safety of structures is their responsibility and relies on self-regulation by owners.	GLP inspects the Compensating Works every five years in accordance with the International Lake Superior Board of Control's Inspection and Maintenance Manual of October, 1983. Reports are submitted Board. Less detailed inspections are carried out on an annual and monthly schedule.	Yes, updated annually	Inundation mapping of the St. Marys River was completed in 2004.
GLP Canal and Clergue Hydropower Plant	1978	Great Lakes Power Limited (owner) Brascan Power Corporation (operator)/ Reconstruction 1984	There are no inspections by Canadian or Ontario governments. Ontario has advised owners that the safety of structures is their responsibility and relies on self-regulation by owners.	Inspection of the hydropower facilities is the responsibility of GLP.	Yes, updated annually	Yes
Compensating Works at Sault Ste. Marie (U.S. portion)/ St. Marys River	1914	U.S. Army Corps of Engineers/ 1921	The U.S. portion of the Compensating Works continues to be inspected regularly in accordance with the engineer regulations of the U.S. Army Corps of Engineers. The next major (5-year) inspection is scheduled for 2005.	None	Yes	Yes
Prairie Portage	1968	U.S. Department	The structure is located partly in Canada and	None	No	No



Structure/ Location	Year of IJC Order	Owner/Year of construction or re- construction	Regular government inspections	Non- government inspections	Emergency action plan	Inundation mapping
Dam/Rainy Lake Basin		of Agriculture, Forest Service/1975	partly in the United States. U.S. Forest Service conducts yearly visual inspections and periodic (5-10 years) safety inspections. There are no government inspections in Canada.			
International Kettle Falls Dam (Canadian portion)/ Rainy Lake Basin	1970	Abitibi Consolidated Inc./1914	There are no inspections by Canadian or Ontario governments. Ontario has advised owners that the safety of structures is their responsibility and relies on self- regulation by owners	A private consultant engaged by Abitibi Consolidated Inc. to follow Canadian Dam Safety Association (CDSA) guidelines performs periodic inspections.	No	No
International Kettle Falls Dam (U.S. portion)/ Rainy Lake Basin	1970	Boise Cascade Corp./1914	This facility is not regulated or inspected by FERC. Inspected by Minnesota Department of Natural Resources at unspecified intervals. It was last inspected by them in 1999 and will be inspected this summer/fall, and is usually inspected every 4 years.	None	No	No
Kettle Falls (Squirrel Falls) Dam in Canada/ Rainy Lake Basin	1970	Abitibi Consolidated Inc./1914	There are no inspections by Canadian or Ontario governments. Ontario has advised owners that the safety of structures is their responsibility and relies on self- regulation by owners.	A private consultant engaged by Abitibi Consolidated Inc. to follow CDSA guidelines performs periodic inspections.	No	No
Fort Frances- International Falls Dam (Canadian portion)/ Rainy Lake Basin	1970	Abitibi Consolidated Inc./1909	There are no inspections by Canadian or Ontario governments. Ontario has advised owners that the safety of structures is their responsibility and relies on self- regulation by owners. In April 2005, the Federal Energy Regulatory Commission (FERC) in the United States, the Ministry of Natural Resources (MNR), Regional Engineering Services of Northwest Region, and U.S. and Canadian dam	Periodic inspections (annual if possible) are performed by a private consultant engaged by Abitibi Consolidated Inc. to follow CDSA guidelines.	An Emergency Preparedne ss Plan (EPP) is under developme nt for the Fort Frances Dam including inundation mapping	The EPP will include inundation mapping

Structure/ Location	Year of IJC Order	Owner/Year of construction or re- construction	Regular government inspections	Non- government inspections	Emergency action plan	Inundation mapping
			owners participated in a joint inspection of the water control structures at the outlet to Rainy Lake, including Potential Failure Modes Methodology.			
Fort Frances- International Falls Dam (U.S. portion)/ Rainy Basin	1970	Boise Cascade Corp./1914	FERC performs an inspection every two years and requires an independent inspection every five years. In April 2005, the Federal Energy Regulatory Commission (FERC) in the United States, the Ministry of Natural Resources (MNR), Regional Engineering Services of Northwest Region, and U.S. and Canadian dam owners participated in a joint inspection of the water control structures at the outlet to Rainy Lake, including Potential Failure Modes Methodology.	The five-year inspection by an independent consulting engineering firm will be completed in 2005 and a report submitted to FERC. Boise would be pleased to submit the same to the IJC.	Yes	Yes
Kootenay River Dykes/ Kootenay River	Begin ning in 1928	Diking authorities under the Dike Maintenance Act	The Kootenay River dykes, located in Canada, are managed by six dyking authorities. The legislative basis for operation and maintenance of dykes in British Columbia is the Dike Maintenance Act (DMA - as recently amended by Bill 56, 2003). Under the act the dyking authorities own the dikes and are responsible for inspection, maintenance and emergency planning and response.	Some inspections are carried out by landowners whose property is protected by the dykes. Under the act, the dyking authorities own the dykes and are responsible for inspection, maintenance and emergency planning and response	Overall regional plan	Yes
Corra Linn Dam/ Kootenay River	1938	FortisBC/1932	This structure is located in Canada. The Government of British Columbia through Land and Water BC Inc. provides oversight and checks compliance by requesting confirmation of annual inspections, completion of Operations Maintenance, Surveillance Manuals and Emergency Preparedness Plans, and Dam Safety Reviews.	Operations Maintenance and Surveillance (OMS) manuals for Corra Linn Dam are used in-house and outline the required level of maintenance, operation, and surveillance in	An Emergency Preparedness Plan (EPP) outlines the procedure & protocol for dam emergencies	Inundation maps are included in the EPP.

Structure/ Location	Year of IJC Order	Owner/Year of construction or re- construction	Regular government inspections	Non- government inspections	Emergency action plan	Inundation mapping
				order to ensure the safe operation of the dam facility. Plant operators perform weekly visual inspections and the Engineering personnel perform annual inspections.		
Waneta Dam/ Pend d'Oreille River	1952	Teck Cominco (owner) FortisBC (operator)	This structure is located in Canada. The Government of British Columbia through Land and Water BC Inc. provides oversight and checks that dam owners comply with the requirements of the Water Act of British Columbia, Dam Safety Regulations. This includes confirmation of annual inspections; preparation, annual review and updating of Operations Maintenance & Surveillance Manuals; preparation, annual review and updating of Emergency Preparedness Plans; and regular Dam Safety reviews.	In addition to providing operating and maintenance information, the Operations Maintenance and Surveillance (OMS) manual for Waneta Dam outlines a level of inspections and monitoring to ensure the safe operation of the dam. The plant operator conducts weekly, monthly and annual inspections; as well as undertakes independent Dam Safety Reviews on a 7-10 year schedule.	Yes.	Yes
Grand Coulee Dam/ Columbia River	1941	U.S. Bureau of Reclamation/ 1941	This structure is located in the U.S. Reclamation staff examine the dam daily as part of ongoing activities. A monthly visual examination is conducted using a site specific checklist. Reclamation provides formal annual examinations by local staff annually and more detailed examinations on 3-year alternating intervals by regional staff and Reclamation's Technical Service Center.	None.	Yes	Yes

Structure/ Location	Year of IJC Order	Owner/Year of construction or re- construction	Regular government inspections	Non- government inspections	Emergency action plan	Inundation mapping
Osoyoos Lake Control Structure (Zosel Dam)/ Okanogan River	1982	State of Washington (owner), Dept of Ecology (operator)/ 1987	This structure is located in the U.S. State of Washington performs annual operational inspections and dam safety inspections every five years on Zosel Dam.	Not applicable	Yes	No



**APPENDIX 3**  
**SECTIONS 91, 92 AND 132 OF**  
**THE CONSTITUTION ACT, 1867**

It shall be lawful for the Queen, by and with the Advice and Consent of the Senate and House of Commons, to make Laws for the Peace, Order and good Government of Canada, in relation to all Matters not coming within the Classes of subjects by this Act assigned exclusively to the Legislatures of the Provinces; and for greater Certainty, but not so as to restrict the Generality of the foregoing Terms of this Section, it is hereby declared that (notwithstanding anything in this Act) the exclusive Legislative Authority of the Parliament of Canada extends to all Matters coming within the Classes of Subjects next hereinafter enumerated; that is to say,

....

2. The Regulation of Trade and Commerce.

....

7. Militia, Military and Naval Service, and Defence.

9. Beacons, Buoys, Lighthouses, and Sable Island.

10. Navigation and Shipping.

....

12. Sea Coast and Inland Fisheries.

....

24. Indians, and Lands reserved for the Indians.

....

27. The Criminal Law ....

....

29. Such Classes of Subjects as are expressly excepted in the Enumeration of the Classes of Subjects by this Act assigned exclusively to the Legislatures of the Provinces....

92. In each Province the Legislature may exclusively make Laws in relation to Matters coming within the Classes of Subjects next hereinafter enumerated; that is to say,

....

Local works and Undertakings other than such as are of the following Classes:

Lines of Steam or other Ships, Railways, Canals, Telegraphs, and other Works and Undertakings connecting the Province with any other or others of the Provinces, or extending beyond the Limits of the Province:

....

Such works as, although wholly situate within the Province, are before or after their Execution declared by the Parliament of Canada to be for the general Advantage of Canada or for the Advantage of Two or more of the Provinces

....

The Parliament and Government of Canada shall have all Powers necessary or proper for performing the Obligations of Canada or of any Province thereof, as Part of the British Empire, towards Foreign Countries, arising under Treaties between the Empire and such Foreign Countries.