

SUMMARY REPORT:

**Workshop on
Emergency Management for Dams -
Ottawa, February 24-25, 2015**

2015



Canadian Dam Association
Association Canadienne des Barrages

www.cda.ca

Table of Contents

I - INTRODUCTION	3
II - WORKSHOP AGENDA AND PRESENTATIONS	4
III - FINDINGS FROM GROUP DISCUSSIONS.....	5
IV - WORKING GROUP ACTION PLAN.....	8
ATTACHMENT A: WORKING GROUP TERMS OF REFERENCE & MEMBERS.....	11
ATTACHMENT B: WORKSHOP ATTENDANCE LIST.....	13
ATTACHMENT C: WORKSHOP AGENDA.....	14
ATTACHMENT D: DETAILED NOTES FROM DISCUSSION GROUPS.....	16
Session #1 - CDA Guidance Documents	16
Session #2 - Stakeholder Needs.....	21
Session #3 - Training and Awareness.....	27
Session #4 - Products, Priorities and Feedback.....	33

I- INTRODUCTION

This report provides a summary of the content and findings of the Canadian Dam Association (CDA) Workshop on Emergency Management held at the Lord Elgin Hotel in Ottawa on February 24-25, 2015. The workshop was organized by CDA's Working Group on Emergency Management under the oversight of the Dam Safety Committee. The terms of reference for the Working Group are outlined in **ATTACHMENT A**.



Sixty-five participants from across Canada gathered to consider the needs of the Canadian dam industry for emergency planning and management related to both conventional water-retaining dams and mine tailings dams. A broad cross-section of representatives of dam owners, operators, regulatory bodies, provincial and federal government agencies, consultants and emergency

management specialists discussed the state-of-practice for dams in Canada. The list of participants is provided in **ATTACHMENT B**.

The workshop featured presentations followed by facilitated breakout sessions which addressed the intended audience, structure and content for CDA's proposed new Technical Bulletin on Emergency Management. In addition, suggestions were made for other supporting products that CDA should consider developing on behalf of the membership. Among the highlighted products were owner and stakeholder training programs, exercise design guides and self-assessment tools to determine an organization's state of readiness.

Of special note during the workshop was the contribution from York and Carleton universities, made possible through the financial and in-kind contribution of Ontario Power Generation. York Professor N. Nirupama led five graduate students currently enrolled in the Disaster and Emergency Management program, along with Carleton's Infrastructure Protection and International Security program, to assist with documenting the outcomes of the breakout discussion groups.

Copies of the presentations were made available to the participants and are available through the members' section of the CDA Website.



II - WORKSHOP AGENDA AND PRESENTATIONS

The organizers provided copies of Sections 1.3 and 4 of the CDA *Dam Safety Guidelines* in advance of the workshop and asked participants to read them. At the start of the Workshop, participants were given binders containing the following materials and examples for discussion and reference:

1. Draft Table of Contents for proposed CDA Bulletin on Emergency Management
2. Excerpt from CDA *Dam Safety Guidelines, 2007*: Section 1.3 and Section 4
3. Ontario Power Generation Standard for Dam Safety Emergency Preparedness and Response Plans (EPRPs), December 2014
4. US Federal Energy Regulatory Commission (FERC) Engineering Guidelines for the Evaluation of Hydropower Projects: Chapter 6, Emergency Action Plans
5. Public Safety Canada, Critical Infrastructure and Strategic Coordination Directorate: Planning Guide, December 2012
6. CSA Z1600: Emergency Management and Business Continuity (Summary from website)
7. T. Bennett and T. Spektor: "Examining Dam Safety Guidelines for Emergency Management in the Context of Industry Standards and Practice." CDA Conference, Montreal, Oct 2013.
8. Presentations (e-versions are available through the members section of the CDA website)

The full agenda for the two-day workshop is included as **ATTACHMENT C**. Fourteen formal presentations (listed below) were interspersed with four breakout discussion sessions.

SESSION 1: SETTING THE CONTEXT		
1.1	Introduction	Tony Bennett
1.2	Canadian Dam Association - Role of CDA in providing guidance to the dam industry	Clare Raska
1.3	CDA Emergency Management Working Group Technical Bulletin Development; Supporting Products for Dam Owners & Regulators	Tony Bennett
SESSION 2: GUIDANCE IN EMERGENCY MANAGEMENT AVAILABLE TO DAM OWNERS		
2.1	US Guidance to Dam Owners - FERC and FEMA	Frank Calagno
2.2	Public Safety Canada Planning Guide and Other Tools Applications to the Canadian dam industry	Ryan Hunt
2.3	CSA Z1600 – Emergency Management & Business Continuity Applications to the Canadian dam industry	Insp. Rob McDonald
SESSION 3: WORKING WITH COMMUNITIES		
3.1	Community Partnership in Building Resilience for Dam-Related Emergencies	Dr. Niru Nirupama
3.2	Emergency Management in the Real World - Expectation, Information, Cooperation and Integration	Lt. Col (Ret) Steve Nash
3.3	Vale – EPRP for Mine Tailings Structures	Nikki Lefebvre
3.4	BC Hydro Community Inundation and Evacuation Mapping Initiative	Tara Laycock
SESSION 4: TRAINING AND EXERCISES		
4.1	Training and Exercises "TO BE" or "NOT TO BE" Prepared - A Decade of a Practitioner's Experiences	Edward Czank
4.2	Life Safety Models	Dr John Perdikaris
4.3	OPG Stakeholder Meetings, Exercise Design and Exercises	Karl Piirik, Tali Serota, Richard Dale
SESSION 5: ENHANCING COMMUNICATIONS		
5.1	Communicating In a Dam Safety Emergency – 2015	Cynthia Wenn

III - FINDINGS FROM GROUP DISCUSSIONS

The breakout discussions were conducted in 8 smaller groups, with assigned facilitators and, in most cases, recorders. One group had a particular focus on tailings dams. The groups provided handwritten, typed and/or flipchart notes for use in this summary report. Those notes have been compiled and edited for clarity and format, and included as **ATTACHMENT D**. However, the notes are intended as an “aide-mémoire” and reference for future discussion rather than a definitive record of the workshop proceedings.

Several themes emerged from the discussions, of relevance to the CDA Working Group as they develop guidance for Emergency Management for Dams. These themes are summarized below.

1. **General** - The Workshop participants indicated that the proposed activities and products of the CDA Working Group on Emergency Management would help them meet their responsibilities for emergency management of dams.
2. **Community of practice** - The workshop provided value through the comprehensive presentations and the opportunity to network with a broad representation of participants from the public and private sectors. CDA should find ways to support ongoing communication and sharing of issues and solutions, including use of the internet (document sharing, discussion forums, webinars, etc.)
3. **Dam Safety Principles** - The principles in CDA *Dam Safety Guidelines* that relate to emergency management should be re-written to present an all hazards approach, addressing all pillars of emergency management (prevention and mitigation, preparedness, response and recovery) and giving consideration to CSA Standard Z1600. All terms should be clearly defined and used consistently.
4. The proposed **CDA Technical Bulletin on Emergency Management** for dams would be very helpful to dam owners, regulators and other stakeholders. The guidance should be organized consistently with the new principles, and include the following:
 - Guidelines for inundation mapping and for failure modes to be considered
 - Communication tools, guidance and checklists for engaging communities and communicating risks.
 - Guidelines, support, tools and checklists for conducting exercises.
 - Guidelines, support, tools and checklists for training sessions.
 - Clarity on roles, responsibilities and legal considerations.
 - Recognition of different regulatory regimes
 - Include the identification of critical infrastructure that may be impacted
5. **Key stakeholders** should be identified and engaged early in planning and developing the Bulletin and other products. By doing this, CDA can enlist broader support in the development process, create more useful products, achieve broader acceptance of the products, and make a stronger contribution to dam safety.

6. **Existing resources** are extensive, and CDA should consider ways to utilize existing standards, guidelines, training programs, government agencies and industry groups.
7. **Tailings dams** belonging to mining companies should be addressed in the Bulletin. A consistent overall approach would apply to all dams, but there are a number of issues related to tailings dams that merit specific guidance:
 - Environmental consequences of tailings dam failure
 - Changing specifications and consequence classification over the life cycle
 - Engineer of record responsibilities
 - Long term responsibilities for decommissioned tailings dams.
8. **Interoperability**, or the ability for diverse organizations to work together for a greater good, is critical during an emergency. Roles, responsibilities and the accountability structure must be clearly defined for all stakeholders, including dam owners and emergency responders.
9. **Inundation maps** are key items that a dam owner must make available for emergency responders and local governments. Guidelines for inundation mapping would be helpful, including technical criteria for what events are to be considered, and examples of inundation maps that serve the needs of key stakeholders.
 - Which failure and non-failure events should be mapped?
 - What information will be needed by operator and the response agencies? What type of map will best serve that purpose? How can dam owner provide information without alarm?
 - Consider 'simplified' inundation mapping for use by first responders.
 - Use common language and templates.
 - GIS technology should be fully integrated into the inundation mapping process to ease distribution
 - Inundation maps need to reflect 'realistic' scenarios as well as the extremes in order to focus the response efforts of all agencies, including the owners.
 - Do all dams (small and large) need inundation studies?
10. **Emergency** must be defined. Emergency scenarios may include events that are not dam failures, including flood flows, security threats and public safety incidents. There needs to be a seamless response for events that may escalate. Dam owners need guidance on surveillance triggers and activation levels. These activation levels need to be clearly understood by all responders and will be an important component of the training and awareness program.
11. **Hazard identification and risk assessment (HIRA)** should include all hazards (not just natural floods) and types of consequences
 - Both threats to infrastructure and to downstream communities
 - Threats to cyber-security, as it may affect dam operations, should be assessed
 - Upstream and downstream impacts
 - Consider using tools available from Public Safety Canada's Critical Infrastructure (CI) Gateway and Regional Resilience Assessment Program

12. **Training and awareness** are needed for all stakeholders.
 - Awareness is generally appropriate for media and the public, and CDA could develop materials for education and awareness.
 - Dam operation staff must be trained in how to recognize a developing emergency, communicate the necessary information and mitigate the impacts.
 - A useful CDA product would be identification of competencies needed for various roles, and training materials to develop those competencies.
 - Emergency responders need specific knowledge and information from the dam owners to understand the situations and risks they may encounter.
 - A workshop could be developed on how to develop and conduct emergency exercises.

13. **Modern communication tools** must be embraced before an emergency happens. During an emergency it is too late to learn a new system. The public will be using Twitter and other social media, whether or not the dam owner is.

14. **Benchmarking and self-assessment tools** can be valuable products for dam owners to identify any gaps in their emergency management processes and assess their state of readiness to respond. Benchmarking tools would be used to assess an owner against peer organizations, while self-assessment tools would be an effective means to determine the extent to which the owner's emergency management system has been implemented.

IV - WORKING GROUP ACTION PLAN

On the morning following the workshop, the CDA Emergency Management Working Group met for a debriefing and planning of next steps.

The Terms of Reference for the Working Group and the membership were reviewed (see **ATTACHMENT A**). It was agreed that the Workshop was very successful and established relationships that will be valuable in developing strategies to address ongoing issues and projects. Good progress is being made on the mandate to develop a Technical Bulletin and training program.

The Working Group focused on actions that must be completed before the CDA Conference in Mississauga, October 5-9, 2015. At the conference, there will be a specific session (90 minutes) with papers on the topic of Emergency Management for Dams, similar to that organized during the Banff Conference (2014). In addition, an open meeting of the Working Group is planned, so that all conference delegates can learn about emergency management issues and the activities of the CDA Emergency Management Working Group. The conference will provide an important opportunity to get feedback on the activities outlined below.

The following activities were confirmed as priorities for the Working Group.

1. Raise awareness of Working Group activities with other CDA committees and members.

- a) In particular, the Mining Dams Committee and the Committee on Regulation should be informed of the Emergency Management Working Group activities, so they are positioned to support and benefit from the Working Group.
- b) Updating the CDA website and preparing an article for the CDA Bulletin would raise awareness among the CDA membership.
- c) Ensure that CDA membership input is provided to the Working Group when the products are developed in draft. This can be accomplished by establishing discussion forums and communities of practice, the need for which will be raised to the CDA Board.

2. Engage the federal government in the Working Group activities.

- a) Public Safety Canada and Natural Resources Canada are two key agencies with interests in common with CDA. The Working Group will prepare a letter to outline the goals of the Working Group and suggest future collaboration.
- b) Public Safety Canada will be invited to make a presentation at the CDA Annual Conference in October, similar to that presented at the Workshop, as the Public Safety Canada resources are of value to CDA members.
- c) CDA will seek information on the tools available on Public Safety Canada's Critical Infrastructure website, specifically the "CI Gateway."

- 3. Develop a survey to solicit input from regulators, owners and other CDA members.**
 - a) This survey is necessary to understand the current state of practice and to identify gaps in information and resources needed by the dam community. The information gathered in the survey will be used to justify and prioritize future projects and collaboration opportunities, including with the federal government.
 - b) A small team will develop the survey, with the intent to issue in Survey Monkey in May-June 2015 and report back on the results at the CDA Conference or through the Bulletin.

- 4. Review and revise the principles set out in Section 1.3 of CDA *Dam Safety Guidelines*.**
 - a) The Working Group will develop suggested revisions for presentation at the CDA Conference in October 2015 in order to benefit from the broader input of the membership.
 - b) In addition to reviewing the principles set out in Section 1.3 there is also a need to review other sections of the principles for alignment
 - c) A small team will undertake the review of principles and report back with their recommendations to the Working Group

The Working Group will take the results of the survey and the input from discussions at the October 2015 Conference, and provide a more detailed plan for development of the Technical Bulletin and other products.

ATTACHMENT A: WORKING GROUP TERMS OF REFERENCE & MEMBERS

- Purpose** To develop technical guidance in the area of emergency management for CDA members
- Members** The Emergency Management Working Group shall consist of:
- **Working Group Lead**, appointed by the Dam Safety to lead and manage the Working Group and provide liaison with the Dam Safety Committee.
 - **Steering Members** to provide an overall work plan, detail deliverables and provide technical direction to the Working Group Development Team(s). Steering Members are to be selected to provide a broad representation of emergency management from both the dam industry as well as other sectors. The Steering Members are to be recommended for appointment by the Working Group Lead for approval of the Dam Safety Committee.
 - **Development Team Members** are assigned by the Steering Members based on their qualifications, experience and interest in the subject matter associated with specific assigned tasks. Development Team(s) are to include experienced members as well as those who are entering careers in the emergency management field in order to provide both mentoring and developmental opportunities.
 - In addition, CDA members may self-nominate to the Working Group Lead to express interest in providing initial detailed reviews of selected materials produced by Development Teams, prior to the general release to the CDA Membership.
- Reporting** The Working Group Lead shall provide semi-annual written reports to the Dam Safety Committee, outlining:
- Working Group activities and deliverables in the period
 - Issues arising from Member queries in the area of emergency management
 - Work plan and project expenditures for the upcoming period
 - List of Working Group Members
- Mandate** To develop a plan and deliver on the following initiatives:
1. Hold Workshop to solicit CDA member input on the state of practice and areas for development of technical guidance in the area of emergency management.
 2. Review Section 4 of the CDA Dam Safety Guidelines, and recommend revisions, as appropriate.
 3. Develop a Technical Bulletin on emergency management to supplement *Dam Safety Guidelines*.
 4. Develop a Training Program to support roll-out of products including Technical Bulletin.
 5. Develop strategies to address issues that are relevant and important to dam owners, regulators and dam practitioners in the field of emergency management, based on industry scans of real events, as well as research and development work being carried out by others.
 6. Develop an inventory of real events and major exercises involving emergency response to dam safety incidents and failures, as well as responses to disasters in other

hazardous industries. Develop a process to learn from these events and disseminate learnings to CDA members.

7. Provide technical information to respond to CDA member queries on emergency management.
8. Hold at least 2 meetings per year of the Steering Members and Development Teams. One meeting should be face-to-face and coincident with the annual CDA Conference.

Working Group Members

Steering Committee

<i>Name</i>	<i>Organization</i>
Tony Bennett (Lead)	Ontario Power Generation
Dr. Niru Nirupama	York University
Dr. Etsuko Yasui	Brandon University

Administrative Support

<i>Name</i>	<i>Organization</i>
Jessica Koopman	Ontario Power Generation

Working Group

<i>Name</i>	<i>Organization</i>
Mohan Acharya	Alberta Environment
William Benson	Gannett Fleming, Inc.
Chantal Couture	Parks Canada / Parcs Canada
Annie Dumas	AECOM
Ashley Gusikoski	Saskatchewan Water Security Agency
Marno Klein	Manitoba Hydro
Tara Laycock	BC Hydro
Nikki Lefebvre	Vale
Melanie MacCormick Annie Beth Sampson (Alt.)	Nova Scotia Power Inc.
Troy McQuinn	Ambulance NB
Adam McAllister	Ontario Min. of Natural Resources
Naomi Moore	Grand River Conservation Authority
Scott Morgan	Province of BC, Water Management Branch
Dwayne Meredith	Kerr Wood Leidal Associates Ltd.
Heather Narynski	BC Ministry of Energy and Mines
John Perdikaris	Ontario Power Generation
Tali Serota	Ontario Power Generation
Carissa Sparkes	NL Hydro

ATTACHMENT B: WORKSHOP ATTENDANCE LIST

<i>Name</i>	<i>Organization</i>
Josh Annett	Ontario Ministry of Natural Resources
Christina Baker	
Tony Bennett	Ontario Power Generation
Dennis Bigras	De Beers Group of Companies
Yannick Bossé	AECOM Canada Ltd.
Tracy Brason	Brookfield Renewable Energy
Gaetan Brousseau	Energy Ottawa Inc.
Barry Brown	Mosaic Potash Esterhazy
David Brown	KGS Group
Don Butcher	Canadian Dam Association
Frank Calcagno, Jr.	Gannett Fleming, Inc.
Ian Campbell	NB Power - Keswick Ridge, NB
Greg Carroll	NB Power
Hugh John Cook	Hatch-Niagara Falls
Chantal Couture	Parks Canada / Parcs Canada
Fuad Curi	KGS Group
Edward Czank	
Richard Dale	Ontario Power Generation
Bruno D'Arcangelo	Ontario Power Generation
Amy Del Bosco	
Annie Dumas	AECOM Canada Ltd.
John Eisnor	Halifax Regional Water Comm.
Chris Fleming	Teck Highland Valley Copper
William Foos	Gannett Fleming
Andre Giroux	De Beers Group of Companies
Darlene Goodwin	
David Green	D.M. Wills Associates
Lauren Hebert	
Ryan Hunt	Public Safety Canada
Hugues Jobin	Rio Tinto Alcan
Judith Oluwatosin Jubril	
Marno Klein	Manitoba Hydro
Jie Lao	Ontario Power Generation
Tara Laycock	BC Hydro
Nicole Lefebvre	Vale
Jeremy Lundgren	Mosaic Potash
James Maltby	Sudbury Integrated Nickel

<i>Name</i>	<i>Organization</i>
	Operations & Glencore Company
Anthony Mascioli	Blue Heron Environmental
Adam McAllister	Ontario Ministry of Natural Resources
Rob McDonald	Ontario Provincial Police
Glenn McLaughlin	Agriculture & Agri-Food Canada
Craig Mitchell	Toronto & Region Conservation Authority
Scott Morgan	Province of BC
Gord Mountenay	Mississippi Valley Conservation Authority
Steve Nash	Traditional Excellence
Dave Ness	Trent Severn Waterway
Dennis E. Netherton	StreamFlow Power (Canada)
Prof. Niru Nirupama	York University
David Payne	Safetyscope
John Perdikaris	Ontario Power Generation
Normand Perreault	Brookfield Renewable Power
Karl Piirik	Ontario Power Generation
Darren Pittman	Government of Newfoundland
Mike Poehlamnn	OPG - Ottawa / St. Lawrence
Narayan Pokhrel	TransAlta
Richard Poole	BluMetric Environmental
Clare Raska	Canadian Dam Association
André Roy	Parks Canada / Parcs Canada
Tali Serota	Ontario Power Generation
Robert Simpson	Brookfield Renewable Power
Carissa Sparkes	NL Hydro
Abigail Steel	Gov't. of Newfoundland & Labrador
Charles Stephen Sudom	AAFC-Corporate Management Branch
Cynthia Wenn	Vanguard Emergency Management Consulting Inc.
Gregory Yonick	
Jeffrey Young	Energy Ottawa Inc.
Muhammad Zubair	York University

ATTACHMENT C: WORKSHOP AGENDA

AGENDA DAY 1 – FEBRUARY 24, 2015

ITEM	TIME	TOPIC/ FOCUS OF DISCUSSIONS	PRESENTER
	7:45 - 8:15 am	Coffee/ Welcome	
SESSION 1: SETTING THE CONTEXT			
1.1	8:15 - 8:45 am	Introductions for Workshop Participants - Roundtable Introductions and format for Workshop	Tony Bennett, Tali Serota
1.2	8:45 - 9:00 am	Canadian Dam Association - Role of CDA in providing guidance to the dam industry	Clare Raska
1.3	9:00 – 9:30 am	CDA Emergency Management Working Group - Technical Bulletin Development - Supporting Products for Dam Owners/ Regulators	Tony Bennett
SESSION 2: GUIDANCE IN EMERGENCY MANAGEMENT AVAILABLE TO DAM OWNERS			
2.1	9:30–10:00 am	US Guidance to Dam Owners - FERC and FEMA	Frank Calagno
	10:00-10:15 am	Break	
2.2	10:15-10:45 am	Public Safety Canada Planning Guide and Other Tools - Applications to the Canadian dam industry	Ryan Hunt
2.3	10:45–11:15am	CSA Z1600 – Emergency Management and Business Continuity - Applications to the Canadian dam industry	Insp. Rob McDonald
	11:15-12:00pm	BREAKOUT DISCUSSION #1	
	12:00-12:45pm	Lunch	
SESSION 3: WORKING WITH COMMUNITIES			
3.1	12:45–1:30 pm	“Community partnership in building resilience for Dam related emergencies”	Dr. Niru Nirupama
3.2	1:30 – 2:15 pm	“Emergency Management in the Real World” - Expectation, Information, Cooperation and Integration	Lt. Col (Ret) Steve Nash
3.3	2:15 – 2:45 pm	Vale – EPRP for Mine Tailings Structures	Nikki Lefebvre
3.4	2:45 – 3:15 pm	BC Hydro – Community Inundation and Evacuation Mapping Initiative	Tara Laycock
	3:15 – 4:30 pm	BREAKOUT DISCUSSION #2	
3.5	6:30 – 8:30 pm	DINNER/ Discussion Note: Dinner reservations at a restaurant in Ottawa’s Byward Market will be made for those wishing to continue discussions and build their networks in the dam safety and emergency management community. Details will be distributed at the Workshop.	

AGENDA DAY 2 – FEBRUARY 25, 2015

ITEM	TIME	TOPIC/ FOCUS OF DISCUSSIONS	PRESENTER
SESSION 4: TRAINING AND EXERCISES			
4.1	8:00 – 8:45 am	Training and Exercises “TO BE” or “NOT TO BE” Prepared - A Decade of a Practitioner’s Experiences	Edward Czank
4.2	8:45 – 9:15 am	Life Safety Models	Dr John Perdikaris
4.3	9:15 – 10:15 am	OPG Stakeholder Meetings, Exercise Design and Exercises	Karl Piirik, Tali Serota, Richard Dale
4.4	10:15-10:30am	Break	
SESSION 5: ENHANCING COMMUNICATIONS			
5.1	10:30-11:20am	Communicating In a Dam Safety Emergency – 2015	Cynthia Wenn
5.2	11:20-12:00pm	BREAKOUT DISCUSSION #3	
5.3	12:00-12:45pm	LUNCH	
SESSION 6: NEXT STEPS FOR THE CDA, OWNERS AND REGULATORS			
6.1	12:45 – 1:30pm	BREAKOUT DISCUSSION #4	
6.2	1:30 – 2:15 pm	Discussion Group Feedback	
6.3	2:15 – 2:45 pm	Next Steps for CDA and Workshop Participants	Tony Bennett

ATTACHMENT D: DETAILED NOTES FROM DISCUSSION GROUPS

For each of the four discussion sessions, questions were posed (in bold below), but the intent was to stimulate an open exchange of views and information, so the discussions often roamed.

Session #1 - CDA Guidance Documents

Primary deliverables of the CDA Emergency Management Working Group will be to:

- a. Review the CDA Principles, Section 1.3 Emergency Preparedness, and others, as they relate to Emergency Management and recommend revisions if appropriate.**
- b. Review the CDA Guidelines Section 4 Emergency Preparedness and revise as appropriate.**
- c. Review other Sections of the CDA Guidelines for alignment with the elements of Emergency Management and recommend revisions if appropriate.**
- d. Develop a Technical Bulletin on Emergency Management for Dam Safety. The Technical Bulletin is to align with the Principles and Guidelines, and form the basis for good practice along with other Technical Bulletins produced by the CDA.**

In addition to developing a Technical Bulletin on Emergency Management for Dam Safety, the CDA Emergency Management Working Group has been tasked to develop other products in support dam safety emergency management. Some of the products which the Working Group is considering are:

- a. Training program based on the Technical Bulletin**
- b. Materials to support a Stakeholders meeting**
- c. Exercise Design Manual for Dam Safety Events**
- d. Public education and awareness “pamphlet” available to distribute to stakeholders and the public to inform them of elements of a dam owner’s emergency management plans.**

1.1 Review Section 1.3, Principles for Emergency Preparedness, and discuss whether these represent the overall needs of dam owners, regulators, community first responders and the public.

GROUP 1

- Clarify terms and definitions including “emergency”, EPP, EPRP, etc.
- Principles focus on failure but dam operation without failure could impact downstream.
- Principle 3b focuses on natural failures and structure breach, especially due to natural floods. Emergencies are site-specific, not necessarily caused by natural phenomenon.
- Consider cascading failures: further failure caused downstream by the initial breach. Perhaps define the various failures that could potentially occur, including cascading.
- Clarification needed for roles of CDA and dam owners. Where do the roles of CDA and owners change in the mitigation, preparation, response and recovery of an emergency?
- Should surveillance of dam sites (especially off hours) be considered when developing emergency plans? More on surveillance threshold leading to activation.
- What are legal considerations?

GROUP 2

- Apply an all-hazards approach to EPP
 - Intentional
 - Unintentional
 - Emergency response procedures must be specific to the event
 - Develop specific SOPs.

GROUP 3

- Uses terms that are specific to hydro dams. In addition, Section 1.3 should include terms specific to tailing dams (i.e. water and impoundments).
- Focuses on the importance of human safety but fails to include references to the importance of preventing damage to the environment and to critical infrastructure.
- Tailings dams are built in staggered stages through the mine's lifecycle. The specifications and classification of the dam change at each stage of the process. EPPs and ERPs should be continually updated to maintain appropriate classification levels.
- There is confusion on who is responsible for maintaining and securely storing engineering records of a dam. Does this responsibility fall to the company or to the engineer?
- Need clarification on whether or not all dam classification levels require EPP and ERP.

GROUP 4

- Title should be "Emergency Management" instead of Emergency Preparedness. Terms should be used consistently in text. "Shall" and "should" need to be sorted out.
- Should focus on principles, based on responsibilities or on the 5 pillars.
- Structure principles so they reflect what happens during an emergency.
- Principle 3c:
 - Raised the question of how dam owners are to function outside the organization.
 - More descriptive of what a plan should have rather than an outline of principle. Too specific and inconsistent with 4.1.
 - Reference to "Emergency preparedness procedures... for use by external agencies" is confusing. Dam owner is responsible for its plan and for communicating the dangers. External agencies are responsible for their own plans and for responding on the basis of information they receive.
 - Reference to "public safety within the floodplain" is too narrow.
 - Accountability structure (who should lead, what organization) is not always clear.
 - Make sure stakeholders are identified.
 - Ensure coordination and communication - joint effort.
 - Consider changing the order of 3b and c.
 - Breach doesn't always mean imminent threat. Need to define "emergency."
 - What is expected from response agencies? No talk of response plan but speaks on the lines of communication.
- Principle 3d:
 - Recovery is not addressed, i.e. once the emergency is dealt with, what then?

GROUP 5

- Common acronyms such as ERP and EPP should be used.
- Definitions should be clear, especially "emergency."

- Outline various activation levels with examples of who gets notified.
- Do we want an all hazards approach or just hydraulic event?
- Are we going to adopt CSA Z1600. Does CDA have a suggestion for overarching management system or put these in separate technical bulletins?
- Need checklists – point to Public Safety Canada.

GROUP 6

- Principal 3a:
 - Difficult to fully define consequences; clarification
 - How do you quantify life safety?
 - Issue with terminology: change “preparedness” to “management”
 - One integrated plan is better than 2 separate documents
 - Currently a “consequence management” framework
 - Evolving terminology
 - Preparedness vs. mitigation. Are they too similar? How to differentiate between?
 - Mitigation is part of planning. What does mitigation include?
 - The “silo” effect; connectivity between silos is more prominent in recent years
 - Community perception; common language
 - Communication to stakeholders should be included
 - Emergency deactivation should be mentioned in document, as well as recovery
- Principal 3b:
 - Change “should” to “shall”: “If you want to achieve this goal, you shall...”
 - Language needs to be consistent: “should” can be used for recommendations
 - Is this ‘best-practice’?
 - Targets should be set higher than anticipated; setting the bar higher
 - Should include all hazards instead of just flooding; however flooding is the most prominent hazard facing dam owners/operators
 - Is HIRA included? What are the threats to the infrastructure? Impacts to downstream communities; 2 separate HIRAs
- Principal 3c:
 - Upstream not mentioned
 - Principal 3d:
 - Include a time frame for more guidance
 - Include evaluation and acting on recommendations (spell it out)

GROUP 7

- Point out re Principle 3a, that emergency management is an ongoing process, and like all management systems it should go periodic review and lessons learned.
- Note all impacts of dam failure, in addition to flooding. Dam failures can affect drinking water supply (water conservation dams). Rapid reservoir drawdown due to a dam breach could lead to landslides and/or destabilisation of reservoir rim. Need to relate to secondary effects (e.g. impacts to upstream stakeholders).
- Principles and guidance should be flexible so that the issues are addressed in convenient manner.

- Owners and operators of dams should understand realistic timing for effective response – problem must be discovered, verified and communicated, the plan activated, and responders get to site. Compare to the travel time of the flood wave.
- Develop steps and procedures to involve local civil authorities and decision makers in mitigation, emergency preparedness and response planning. The decision makers should be identified well before an incident and be the part of development process.
- CDA should recommend IMS/EMS type of training courses or as practiced in US, NIMS and ICS which can be linked to dam safety and to build the capacity of dam operators and related personnel.
- Dam owners should be encouraged (given responsibilities?) to provide technical and information support to stakeholders/authorities in emergency response.
- Effective communication tools should be developed between stakeholders.

GROUP 8

- Define “emergency” and “dam safety emergency.”
- Change “preparedness” to “management.”
- In general, definitions should be clarified and made consistent. (E.g. OPG and OPP, two close entities, use different terminologies).
- Should we use an all-hazards approach or specifically hydraulics and dam safety?
- Have two separate plans – internal ERP, external EPP.
- Standardized contents for EAP (e.g. use OPG version as template).
- Templates and formats are helpful.
- Dam classification determines need for EAP.
- Also internal economic impact analysis of financial impacts is needed.
- Include checklists in emergency plans.
- Introduce different activation levels and who gets notified.
- CEATI made recommendations on activation guidelines.
- Notion of maintaining a state of alertness.
- Are we adopting CSA Z1600?
- Does CDA suggest overarching management system approach? Would that be in separate bulletins?
- Consider using e-learning to educate.
- Inundation studies for storm or flood event show the devastation created. Challenge to provide this information to the public without causing panic. Consider incremental flood vs. the wide-plain flood (PMP vs DNT).
- More emphasis on recovery.

1.2 ***What guidance/products need to be developed to support the 4 principles described in CDA Guidelines Section 1.3, Emergency Preparedness?***

GROUP 1

- Guidance needed for inundation mapping
 - Identify scenarios to be addressed
 - Identify minimum requirements for inundations maps (100 year event, etc.)
 - Both for small dams and high consequence
 - Who provides what maps? (Dam owner – emergency – public/municipalities)

- Operator works with information available at the time: if document is too complex and specific, the operator may not get the breach information needed, so a more simplified plan would be beneficial to the operator.
- Available inundation maps determine which areas need to be evacuated. Different stakeholders have different interests in the inundation maps.
- Is CDA involved in guidance for the response plans of the various responders and stakeholders? Provincial levels oversee emergency management principles.

GROUP 3

- Inundation maps may be difficult for a layperson to understand. Communication materials intended to educate the public should be included with the inundation study. Inundation study should be put into context to improve understanding. For example, the likelihood of devastation caused by a dam should be compared to more familiar event (i.e. lightning).
- Similarly, the environmental impacts of a flooding event caused by a tailings dam should also be put into context to improve public understanding.
- Documents that provide answers to frequently asked questions and dispel common myths should be created to educate the public about the inundation study.
- Difference between incremental floodplain and PMP should be clearly explained.
- Clarification needed on which stakeholders should be given the inundation studies.
- Types of inundation studies (e.g. 100 year flood, PMP, sunny day flood) required by dam owners should be specified.
- All staff/visitors at tailings dam site should be trained on how to react in emergency.
- Accessible, easy-to-read emergency preparedness materials needed for the public.

1.3 *Would the guidance/products be part of the Technical Bulletin or separate?*

GROUP 1

- Preference to be all inclusive of products

GROUP 2

- Products should be reference in Technical Bulletin, but kept as separate documents.

1.4 *Highlight any resources or reference material that may be available to assist the Working Group in development of the products.*

GROUP 2

- EMO
- FEMA
- Public Safety Canada
- FERC
- Homeland Security
- CSE/CSIS

GROUP 3

- Mining Association of Canada (Crisis Management Reference Guide) Guidelines
- Towards Sustainable Mining Initiative

Session #2 - Stakeholder Needs

The CDA Emergency Management Working Group recognizes that everyone's interests are best served by having resilient communities and plans in place that are full integrated amongst dam owners, community first responders, regulators and stakeholders.

2.1 What do dam owners need to plan for?

GROUP 1

- Worst case scenarios
- Planning for interdependencies
- Know key roles of those involved if an emergency were to occur; involvement with EMO
- Redundancy and operational redundancy (ex. backup power sources, staff sources)
- Communication
- Alternative routes for staff on and off site,
- Debris handling (e.g. removal of ice that could block the dam),
- Preventative maintenance programs
- Recovery.

GROUP 2

- Any events that may compromise the safety of the dam
- Failure modes and analysis
- Compromise dam operations and operator safety
- Compromise downstream land owners and population at risk (PAR)

GROUP 3

- Evacuation if necessary
- Tailing dam owners should consider the following:
 - Environmental impacts
 - Educating the public
 - Ensuring stakeholders and communities are included in the emergency management working group

GROUP 4

- Plan for any event that threatens life or property.
- Dam failure, flood (high flow), "hazards," "public safety."
- Floods may lead to an issue of dam safety but not necessarily so.
- Anything that causes damage
- Dam owners need to be aware of threats and plan accordingly for effective communication. The threat of a bomb is different than the explosion causing damage.
- How to deal with impending issues and communicate effectively (i.e. the OFMEM). What can cause the dam to fail, what is being done after it has failed? Keeping in mind if the dam failure has the potential to impact life, property, and infrastructure within the community. How does the structure impact the community?
- Onus on the dam owner for public safety.
- When are dam owners leading a safety/rescue operation or providing support?

GROUP 5

- Need to supply a Table of Contents for the EPP
- What is the responsibility of dam owners? Do we want that in CDA? (No). How much responsibility/liability should the dam owner take?
- Key information required by owners/regulators/stakeholders
 - Distribution of flood inundation maps – stakeholder not dam owner
- Detail dam owner's responsibility as awareness
- CDA role is public education for public to understand risk of dam failure. Delivery should address more up-to-date means
- Update CDA website and make it more interactive
- Bulletin needs to be high level regarding stakeholder involvement
- Maybe produce a template on how to inform and present an EPP to stakeholders
- Training of what is in an EPP and how to notify stakeholders

GROUP 6

- Need to be planning for all hazards/causal agents; 'All-hazards approach'
- Need to plan for conflicting interests amongst various stakeholders (?)
- Integration with communities
- Role clarity (Unified command, etc.); how they fit into Incident Command structure (IMS)
- Joint media protocols? Alternative communications
- Varying capacities of the communities
- Knowledge of resources available to them (inventory)
- Mutual aid

GROUP 7

- They should plan for indirect or secondary emergencies, such as drop in water level.

GROUP 8

- Roles and responsibilities of dam owner. How much responsibility/liability should the owner take?
- Roles and responsibilities of other stakeholders
- Who leads the emergency management process?
- CDA could take a role in public education on risks of dam failure
- Possible additional material and templates for public meetings
- Possible additional training and emergency plan preparation

2.2 Who are the stakeholders and how should they be interacting before, during and after a dam safety incident?

GROUP 1

- Public, first responders (police, fire, EMS), governmental agencies from all tiers, local emergency management team, media, transportation operators and the ministry, dam operators and owners, basically any critical infrastructure stakeholder.

GROUP 2

- Downstream residents
- Downstream business
- First Nations
- Emergency responders (police, fire)
- Local municipalities (upper tier/ lower tier) communities
- Provincial/federal governments
- Community leaders
- Vendors, suppliers
- Third party contractors
- Hospitals, paramedical services
- Media, telecommunications
- Politicians
- Preparedness
 - All, with exception of media and politicians
- Response
 - Emergency responders
 - Local authorities
 - All, as required
- Recovery
 - Local government agencies
 - Vendors/suppliers
 - Third party contractors
 - Insurance
 - All, as required
- Mitigation
 - All, with exception of media and politicians

GROUP 3

- Meetings between dam owner and different stakeholders should take place to ensure that all parties are aware of the risks that they are subjected to from the dams.
- Stakeholders should be involved during all stages of creating and testing the dam safety exercises. During and after a dam safety incident, stakeholders should be kept in communication with the dam owner.
- Stakeholders include:
 - Provincial and federal government departments
 - Ministry of Environment
 - Ministry of Public Health
 - Ministry of Natural Resources
 - Regional/municipal governments
 - Conservation authorities
 - First Nations communities
 - Local industries
 - First responders (fire fighters, police officers, paramedics)

GROUP 4

- Define and identify “stakeholders.”
- Different agencies responsible before, during, after the emergency.
- Stakeholders include the affected public: First Nations, municipalities, provincial government, infrastructure agencies, emergency management and response agencies
- Dam owners more aligned with preparedness which consists of stakeholders that will change based on what level of the emergency is being discussed
- Public awareness is needed.
- Public education beforehand: That there is a plan, what are the risks, what you are expected to do if sirens sound, or emergency responders arrive or don’t arrive. (e.g. BC Hydro approach “if you feel the ground move, get to higher ground”).
- During emergency, response agencies interact, communicate and coordinate with stakeholders.

GROUP 5

- Non-compatible systems between dam owners, agencies, etc.
- How do we impose on a community to take over flood emergency management
- Rural areas where coverage is limited
- Not all municipalities have technical capabilities
- Communicate with stakeholders before event and keep communications open.
- Bulletin should recognize social media but not be detailed
- Opportunity to get feedback from social media – adapt to ever-changing social media

GROUP 6

- Stakeholder: anyone affected by a dam breach
- Need to communicate with stakeholders in downstream communities
- Priority call-out changes with each emergency event
- Theoretical vs. reality

GROUP 7

- Stakeholders include anyone that receives benefits or is affected by a dam.
- These stakeholders should be identified by the dam owners.

GROUP 8

2.3 To what extent and how should dam owners reach out to stakeholders to improve response and resiliency?

GROUP 1

- Quality assurance initiatives: Exercises, reviews, etc.

GROUP 2

- Stakeholder meetings
- Information sessions (for separate stakeholders)
- Media – television (public education), internet (webpage), radio
- Public information

- Newsletters
- Pamphlets
- Newspaper ads

GROUP 3

- Dam owners should regularly reach out to stakeholders through one-on-one meetings and community meetings to ensure resiliency.

GROUP 6

- Dam owner should have the ability to go directly to the public in some instances
- Community awareness and education prior to an emergency event
- Due diligence; incentives
- Effectiveness monitoring
- **How** do you communicate with the community; public information
- Keep community messages simple and short; common language; effective messaging
- Social and cultural element to communication; language barriers
- Multiple media platforms; captivating
- How to engage First Nations

GROUP 7

- Dam owners are the part of community; they should act as a proactive community member and be responsible as public service provider.
- Through CDA, public awareness campaign should be initiated by introducing guidance for “education programs” in schools particularly in floodplains or flood hazard zones.

GROUP 8

2.4 What are the key pieces of information required by owners, regulators and stakeholders in planning, response and recovery?

GROUP 1

- Current information on contact information, key roles of stakeholders during emergency.
- Recovery time: How long would it take to recover from various levels of disaster?

GROUP 2

- Impact area (i.e. inundation area/map)
- Safe evacuation zones
- Safe havens (e.g. community centres)
- Resources
- Communication contact list

GROUP 3

- CDA and MAC Crisis Management Reference Guide) Guidelines
- ERPs and EPPs need to be updated throughout the lifecycle of the mine
- Equipment available from first responders, contractors, local governments, other companies

- Dam training workshop (for everyone working on our visiting the dam)
- Emergency evacuation pamphlets (i.e. BC Hydro map showing escape routes)
- Roles and responsibilities of stakeholders

GROUP 6

- List of available resources
- List of subject matter experts
- Each municipality should have inundation maps

GROUP 7

- Effective and complete information is required at each level:
 - Technical and regulation information for planning and owners
 - General information for stakeholders.
- CDA should propose standards in dam structures and safety. Regulators may require rehabilitation or improvements to existing dams. Decommissioning is also considered by the regulators.

2.5 *When an incident is first identified, what are the issues and challenges in activation of response; and how should it transition from notification to response?*

GROUP 1

- Identifying who has the authority to identify that an emergency is taking place and at what point should it be declared, also to whom is that information relayed.
 - Consultation with stakeholders, public and private

GROUP 2

- Forecasting and warning
- Understanding the severity of the event

GROUP 3

- Who is responsible for notifying the public (support level response)? Is it the dam owner? OPG has delegated the OPP as responsible.
- When multiple communities need to be notified (e.g. four communities located near one mine) it can be challenging to ensure all are notified in an efficient, effective manner.
- Mutual-aid agreements for dams in remote areas should be created to ensure that the activation of a response is successful.
- Agreements with stakeholders in the surrounding communities should be created to ensure the appropriate resources will be made available to respond to an emergency.

GROUP 4

- Management needs to support and authorize someone close to the event to make the timely call of response/activation. Trust in their expertise. Must be available 24/7.
- Verification involves balancing the need to be fast but not “cry wolf”. Smooth move from notification to response is a challenge.

GROUP 7

- Communication of accurate information between all pre-identified stakeholders is needed for timely internal decision making, and communicating and mobilizing for external notification.
- Comprehensive internal dam monitoring systems are needed for efficient response and communication.

GROUP 8

2.6 How can dam owners best integrate activation guidelines with the community and other stakeholders?

GROUP 1

- Ongoing communication

GROUP 3

- Ensure that stakeholders and the community are consulted throughout the creation of activation guidelines.
- Create mutual-aid agreements with local first responders.
- Clearly identify each stakeholder's responsibilities (i.e. gather all of the stakeholders in the same room at once to assign responsibilities).
- Communicate with stakeholders about how closed dams are being monitored.

GROUP 7

- Develop good public relations, extended to the community
- Good practice guidance information needs to be made public through stakeholders.

2.7 Do community planners, first responders and the public understand the risk of dam failure? What is the CDA role in improving this?

GROUP 1

- The CDA's role: a resource for those groups should they need technical knowledge or presentations, or to provide clear and concise definitions.

2.8 When do community first responders need information from a dam owner (i.e. forewarning)?

2.9 What should the interoperability between the dam community and local emergency management offices look like?

Session #3 - Training and Awareness

CDA recognizes the importance of maintaining a state of readiness, and that awareness and training are different.

Take the opportunity to review your group's responses to each of the breakout sessions and complete any further feedback you wish to provide to the Working Group. Be prepared to summarize your group's discussion during the feedback session.

3.1 What are the training needs for an effective emergency management system to be able to address dam safety events, when considered in the context of mitigation, planning, response and recovery?

GROUP 1

- Workshops, various ongoing exercises (functional, table-top, drills, etc.), a combination of training and exercises back to back, in terms of recovery, research is needed in finding out who offers training in that phase (both short and long term recovery); another issue with recovery is that it will differ vastly between dam owners (priorities of recovery depend on the priority of the dam itself; legal elements of training are also a consideration.

GROUP 2

- Mitigation
 - HIRA workshop
 - Business impact analysis (BIA)
- Planning
 - Case study
 - Exercise design
 - IMS (Basic, advanced)
- Response & Recovery
 - How to set up an EOC
 - Communications
 - Media communication
 - Social media communication

GROUP 3

- Mitigation
 - More inspections
 - Automated surveillance systems
 - Operation Maintenance Surveillance (OMS) manuals
 - Corrective action plans – tracking systems – correspondence
 - Open lines of communication
 - Work order system (work management systems)
 - Mining Association of Canada guidelines for preparing OMS manuals
 - *Planning*
 - Overall plan for all employees
 - Knowing who/where key contractors are
 - Stakeholders
 - Develop and prepare an ERP as well as an EPP and train the employees
 - Mutual aid agreements
 - Notification procedures
 - Tabletop exercise
- Response
 - Notifications (internal/external)

- Communication methods
 - Roles and responsibilities
 - Incident management system
 - Understanding business emergency management system
- Recovery*
- Roles and responsibilities
 - Prioritize business activities
 - EOC training

GROUP 4

- Basic emergency management, IMS and EOC operation: roles, responsibilities, tools.
- Geotechnical or structural expertise must be quickly available for mitigation of dam failure.
- Train operating staff to identify problems, communicate what is happening, who to contact. Immediate response must be available. E.g. ERP should say what to do immediately in case of “leakage”- not detailed but perhaps say who to contact.
- Training: When something happens, do this.
- Include recovery, at a high level. How to regain control of the dam, replace the bridge, how do you keep people out of the site? For example, owner doesn’t worry about traffic, which would be provincial government. Shelters would be covered under the municipal plans.
- Communication: Consider social media. Satellite phones. The spokesperson and public relations people need EMO course.

3.2 ***Who needs awareness and who needs training? (dam owner, community first responders, stakeholders, regulators, media, the public)***

GROUP 1

- For the most part, awareness is for media and the public, training for media would be difficult because of information sharing and relationships with them would be difficult to maintain; first responders require training – it is important for them to have dam specific knowledge so that they are aware of the risks they could be exposed to when responding to a dam failure.
- Dam site awareness for first responders

GROUP 2

- Awareness
 - Media
 - Public
 - Stakeholders
- Training
 - Dam owners
 - First responders
 - Regulators

GROUP 3

- Awareness
 - All employees
 - Community members
 - Visitors and contractors
 - Stakeholders
 - First Nations communities
 - Outside emergency agencies (maybe training too)
- Training
 - Employees involved directly with dam
 - EOC
 - First responders
 - On-call personnel
 - Security staff
 - Government
 - Outside emergency agencies, as necessary

GROUP 4

- Awareness (high level):
 - All employees
 - Public stakeholders, upstream and downstream
 - Local politicians
- Training
 - EOC staff - anyone in the ICC
 - Dam operators
 - Plan copyholders
 - Emergency responders

3.3 *Who is responsible for training?*

GROUP 1

- Because of the above point, often first responders are not educated in dam safety, therefore, the first response agency holds some responsibility in terms of dam specific training; all stakeholders

GROUP 2

- Dam owners
- Plan owners
- Regulators
- First responders
- Media

GROUP 3

- Facility owner – designate a staff member, with competencies

GROUP 4

- If it is the dam owner's hazard, owner must provide training for those groups listed above in question 3.2, including everyone in the corporate, EOC, ICC.
- First responders are responsible for their own training but dam owners are responsible for training related to their infrastructure. They will have their own way to deal with things but the specifics of the dam situation and terminology needs to be conveyed to responders.
- First responders need to know what to expect. Train them to integrate your emergency into their procedures. You wouldn't teach them to go door to door. But it would be your responsibility to let them know what areas to go to.

3.4 What type of external training programs can be leveraged (i.e. colleges, EMO)?

GROUP 1

- OPG resources, EMO courses, individual municipal emergency management offices, FEMA courses, SEED Program (Golden, Colorado).

GROUP 2

- Universities/colleges
- Municipalities
- Professional associations/societies
- Federal, provincial, state government training programs
- Continuing education
- Vanguard/ private vendors
- Certification bodies
- Standards bodies (CSA, ISO)

GROUP 3

- Universities/colleges
- Consulting firms
- EMO (incident command)
- Private training firms
- CDA, MAC, Towards Sustainable Mining Initiative
- Government
- Other dam owners

GROUP 4

- EMO – online and classroom
- CSA Z1600
- Consultants
- FEMA – online and classroom, sector specific
- CDA workshops
- Universities and colleges (BCP, EM)
- Other dam owners.

3.5 What are the challenges related to communication between responders, between response agencies, between response agencies and the media, and with the public?

GROUP 6

- Terminology and acronyms could be confusing amongst organizations; technical jargon
- Breaks in communication; loss of power; lines becoming overloaded
- High volume of calls coming in to the EOC
- Remote locations

GROUP 7

- To avoid miscommunication and protect confidential information, social media is not always a good choice. The public may misunderstand critical or exaggerate critical information, and not look to the most reliable sources of information.
- A joint information centre should be established by the key players and ensure consistency in messages and information.
- Chief of incident site or incident commander should be responsible for providing information to media. Incident commander should be informed of all relevant information that is to be released to public and/or media. Incident command centre should not release any information without the approval of incident commander.
- Political consideration is required for media release.
- Communication plans and communication notification charts should be developed where roles and responsibilities are assigned. Communication process may be considered as critical a process as decision making.
- A unified command provides technical information to the decision makers. Standard definitions of terminology will be needed in information sharing process.

GROUP 8

- Compatibility of systems and equipment
- Service coverage
- Clear identification of roles and responsibilities
- Technical capabilities of stakeholder might be limited
- Maintaining communication channels open in normal conditions to allow better interaction at time of emergency

3.6 What are both the challenges and opportunities related to social media use?

GROUP 6

- Misinformation (intentional) within the media
- 1 point of contact with media
- Under stress, messages can be unclear or rushed and send the wrong message
- How to release a message in a timely manner and avoid false information
- Multiple revisions of a message before posting
- Employees posting information
- Internal training and company policies on how to use social media properly
- Pre-written messages
- Private groups on facebook

GROUP 8

- Social media as a source of input and feedback
- Need for specialized resources in that field

3.7 *Are there elements of the communications challenges that should be addressed in the Technical Bulletin or other CDA products?*

GROUP 6

- Social media updates must be frequent due to the ever changing technology
- How to communicate with the public, stakeholders...etc
- Internal updates
- Leave out specifics; focus on key considerations

GROUP 8

- There needs to be recognition of social media
 - General, not detailed
 - Adaptable to ever-changing social media

Session #4 – Products, Priorities and Feedback

Take the opportunity to review your group's responses to each of the breakout sessions and complete any further feedback you wish to provide to the Working Group. Be prepared to summarize your group's discussion during the feedback session.

4.1 *What are the products?*

GROUP 1

- Communication tools (e.g. fact sheets)
- Training course developed and delivered by CDA
- "Hands-on training"
- Info sharing/ CDA resource

GROUP 2

- Guidelines for emergency management
- Technical Bulletin
- Standards
- Procedures
- Training – workshops, courses
- List of competencies for each role

GROUP 3

- Seminars and workshops on the guidelines
- Workshops for tailings dam owners
- Pamphlets

- Criteria for tailings dams inundation studies (e.g. sunny day, 100 day flood, PMP)
- Jurisdictionally-based legal requirement; summary of requirements across Canada
- Environmental impacts caused by different types of tailing mines
- Post-closure guidelines
- Training materials
- Literature Review
- MAC and CDA documents should reference each other, not duplicate

GROUP 4

- Revision of relevant sections of CDA Guidelines - Section 1.3 and 4.0.
- Technical Bulletin supporting principles and guidelines (see 4.2 below) and providing emergency Management guidance specific to the dam industry
- Workshop
- Roll out newsletter or package and materials
- Web content to provide information
- Hands-on workshop on how to do an ERAP if CDA is interested in providing this service

GROUP 5

- Should inundation mapping guidance be in Bulletin?
- Maps need to be reduced in technical content and CDA should provide standard guidance.
- Bulletin Table of Contents provided is focused on EPP guidance. Should add guidance on roles and responsibilities required for emergency management.

GROUP 6

- Update of guidelines
- Template for information packets for public, communities, ministry regulators, etc.
- Proper definitions to reduce confusion
- More guidance on recovery planning

GROUP 7

- Need for standardized terminology (ICS)
- Instruction manual
 - How to set up and maintain EM program
 - Include samples with various scale structures or dam owners
 - Plan checklist (must have, could have) and supporting documents or references
 - Guidance for Recovery Plans (samples)
 - Guide to inundation mapping
 - Guideline for emergency activation; decision matrix or flowchart
 - Include secondary impacts of dam failure, e.g. upstream stakeholders
 - Strengthen link between PFMA and EPRP

GROUP 8

- Emergency management system technical bulletin
- Database of EOP examples
- Training how to run functional exercises
- Mobile-based products

- Twitter account
- Check sheets for different components of the emergency management system
- Check sheets for different components of the emergency management system
- Inundation mapping
- Guidelines for developing an emergency plan (templates)
- Information pamphlet for communities
- Exercise templates and training
- Stakeholder meeting package
- Tips for community outreach - specifically First Nations
- Role checklists

4.2 What needs to go into the Technical Bulletin?

GROUP 1

- Testing requirements and frequency (does OPG have a functional testing template?)

GROUP 2

- Minimal requirements
 - Roles and responsibilities
 - Inundation maps/ consequence classification
 - Maintenance and services
 - Activation guidelines
 - Communications

GROUP 3

- Consistent terminology
- Literature review
- All hazards approach
- Examples
- Guidance on training
- Communications
- Best practices

GROUP 4

- Examples
- Industry standards, sample methods, guidance on training, EPRP structure and contents, best practice for communication, notification charts, flowcharts
- State clearly that owners should “involve emergency management organizations in EPRP development early.”
- Guidance for early warning systems

GROUP 8

- Guidelines for inundation mapping – standardized and simplified for general use
- Overall guidelines to assign roles and responsibilities
- Guidance on activation levels. How to activate and what is the level of response.
- Guidance on how to manage emergency system. Will CSA Z1600 be the EMS model?

- Consider all hazards vs. hydraulics only
- Guidelines for communication with stakeholders, recognizing social media
- Checklists and check sheets to use in an emergency by responders

4.3 Who are the audiences?

GROUP 1

- Dam owners, Public Safety, EMO

GROUP 2

- Dam owner and operators
- Emergency services
- Regulators

GROUP 3

- Dam owners/ operators
- Consulting group
- Local governments
- Stakeholders
- Professional associations
- Colleges and universities
- At-risk individuals (school age)- make it a priority to train schools similar to
- First Nations communities

GROUP 4

- Dam owners, industry, operators, consultants, engineers, emergency management consultants, employees
- Policy makers, government agencies and regulators
- Emergency responders
- Prosecutors

GROUP 7

- Dam owners
- Consultants
- Tailings pond dam owners
- Regulators

GROUP 8

- Owners
- Governments/regulators
- Public
- Agencies
- Emergency responders
- Consultants
- Educators

4.4 What are the priorities?

GROUP 1

- Training workshop including exercise
- Inundation map templates.

GROUP 2

- Guidelines
- Technical bulletin
- Training

GROUP 3

- Summarize existing guidelines (including MAC) and regulations and do gap analysis
- Resolve inundation study criteria
- Develop training packages
- Develop guidelines for abandoned tailings dams
- Develop a list of best practices and lessons learned from other organizations/companies
- Create a database of ERPs and EPPs for different types of dams and dam structures
- Create guidelines for tailing dam recovery plans
- Provide guidance as to what to include in stakeholder packages
- Create community engagement/outreach materials (e.g. for First Nations communities, the general public)
- Ensure that all stakeholders are involved in creating ERPs and EPPs to ensure that resources are used efficiently and effectively.

GROUP 4

- Guidance for dam owners for emergency management planning
- Clarify Section 1. 3 and 4.0 of CDA guidelines beforehand so that it can be presented
- Development of technical bulletins
- Ongoing training and workshops.

GROUP 7

- Gather and share sample documents
- Identify new technologies (web, EOC, communication tool)
- Instruction manual on emergency plans

GROUP 8

- Adjusting Guidelines/Principles
- Best practice checklists/survey
- Develop guidelines for emergency plans
- Training
- Facilitate public awareness

4.5 What resources are needed and what reference material is available?

GROUP 2

- Current state of legislation
- Current regulations and requirements

GROUP 3

- Survey Monkey
- Create an online forum on the CDA website for emergency managers and tailings dam owners to share problems, ideas, solutions, reference materials, etc.
- Create materials for dam owners to give to stakeholders.

GROUP 7

- Get input from legal and insurance
- Emergency response agencies
- International sources (e.g. FEMA)
- Best practices in other industries, for emergency management

GROUP 8

- Emergency management standards
- Exercise design templates (online)
- Academic publications
- FEMA
- Anecdotal knowledge
- Community knowledge/cultural relevance