



THE INTERNATIONAL ENERGY AGENCY TECHNOLOGY
COLLABORATION PROGRAMME ON HYDROPOWER

IEA Hydropower

Joint ANNEX IX and XII Workshop
27 May 2020, online GoToMeeting platform, 2pm – 4.30pm CET

Flood Control and Drought Management Services

Agenda

Time	Wednesday 27th May 2020	Presented by
14:00	Opening and Review of Dec 2019 Joint Workshop Conclusions	Jorge Damazio, CEPEL Atle Harby, SINTEF
14:15	Brief update on Annex XII activities	Jorge Damazio, CEPEL
14:25	Brief update on Annex IX activities	Atle Harby, SINTEF
14:35	Columbia River Case study	Nathalie Voisin, PNNL
14:50	Flood forecasting and reservoir operation in the East-Telemark hydropower system	Ånund Killingtveit, NTNU
15:05	Hydropower Services Case Study: Drought Mitigation in Tasmania	Carolyn Maxwell, Hydro Tasmania
15:10	Break	
15:20	Paraíba do Sul River case study	Jorge Damazio, CEPEL
15:30	Simple estimation of potential flood control contribution from hydropower. Case studies from Norway	Bendik Hansen, SINTEF
15:40	Dibang Multipurpose Storage Project for Flood Moderation & Hydropower	Arun Kumar, IIT Roorkee
15:45	Case study report: Reviewing contributions and edition of report	Operating agents
16:00	Potential White Paper content	Operating agents
16:15	Discussion about Special Session at HYDRO 2020	Operating agents
16:25	Any other business	All
16:30	End of meeting	



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Registered participants	Tentative registered participants
Jorge Machado Damazio	Maria Ubierna
Atle Harby	Óli Grétar Blöndal Sveinsson
Niels Nielsen	Bjørn Sønju-Moltzau
Alex Beckitt	Siri Stokseth
Heymi Bahar	Peter Bauhofer
Alain Tremblay	Vladimir Koritarov
Toril Christensen	Tor Haakon Bakken
Fredrik Arnesen	Furkan Yardimici
Nathalie Voisin	
Samuel Bockenhauer	
Carolyn Maxwell	
Albert de Melo	
Maria Elvira Pineiro Maceira	
Marcelle Tavares Marques da Silva	
Luke Middleton	
Klaus Jorde	
Elvis Silveira	
Elena Vagnoni	
Abhishek Somani	
Bente Taraldsten Brunes	
Lennart Hagen Schönfelder	
Anton Schleiss	
Felix Matt	
Rita Johnsen	
Bendik Torp Hansen	
Ånund Killingtveit	
Arun Kumar	

(the list above is not complete according to who actually participated, but includes those who used Outlook to respond to meeting invitation)



Questions, comments and answers

(copy of chat-log, slightly edited)

Niels Nielsen : 14:53: Nathalie. With earlier snowmelt, how will Canada be affected (Columbia River in BC provides most flood storage) in terms of drawdown of major reservoirs and how will the change in operation be compensated?

Nathalie Voisin : 14:56: The Upper Columbia is affected by climate change with earlier snowmelt as well. Canada benefits from hydropower while the US benefits from the river services provided by the Canadian reservoir operations. The Canadian operations are the topic of the Columbia River Treaty, discussing compensation for the river services among other stakes. The new Treaty is still in the negotiation process.

Nathalie Voisin : 15:06: Ånund. How are flood damages valued and do hydropower dams get compensated for avoided damage?

Arun Kumar : 15:09: Ånund Same as Nathalie wrote: How are flood damages valued and do hydropower dams get compensated for avoided damage?

Ånund Killingtveit : 15:13: Hydropower get no compensation for avoided damage, but may have high financial losses for example by pre-releasing water from reservoirs to avoid or reduce future floods.

Bendik Hansen : 15:25: Ånund: I would also add that there is a pressure from society for operators to reduce floods, even if not mandated by law. If there is a damaging flood and it is shown that an operator could have prevented it but didn't, they will face serious negative public attention, which is something they don't want since it makes expansions and new concessions nearly impossible. They are also quite keen on highlighting the services they provide to increase their public image and strength in concession revisions. Some also argue that HP should receive some tax exemptions for providing these services

Roy Liu : 15:26: Here in China. Dam operator gets no compensation for avoided damage, but should pay for direct damage to local residents. Yes, these benefits can help on getting the project approved.

Bendik Hansen : 15:28: I think there are one or two cases in Norway where operators were fined for negligent behavior during a flood event. They didn't exacerbate the flood, but did not take expected measures to reduce it.

Ånund Killingtveit : 15:52: Bendik. I agree that most HP owners would try to avoid or reduce floods if possible, but it is not required by law, as far as I know. In one of the recent floods in the Telemark system the dam operator requested the permission from government (NVE) to start pre-releasing water (through power plants) from the reservoir before it was full in order to create more storage space, but this was denied due to environmental concerns (which is to fill the reservoirs as early as possible in the spring). Shortly after, there was a very large flood when the reservoir was full, no free space to store water, lots of flood spill and damage downstream. And now the dam operator was criticized by the same government for not taking action to reduce the flood. One can understand that the dam operator was not happy about this! Could maybe be an interesting example of conflicting interests: flood control, environmental concern and hydropower economy.



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Alex Beckitt : 15:20: Listening to other presenters and issues I think we can potentially sell the science and monitoring we are doing harder and the value this has to broader non energy services - but I need to think more :-)

Klaus Jorde : 15:22: Nathalie, I have the same question as Niels, different climate change scenarios result in very different hydrologic scenarios. How do you consider this uncertainty in CRT negotiations? Any systematic approach?

Nathalie Voisin : 15:22: It really depends on the initial agreement for building the dams. We are only talking about the river services but not inundated areas etc. The licensing is key

Nathalie Voisin : 15:25: Klaus. I cannot speak about the Treaty. However, the River Management and Operations Committee ran 20 GCMS, 4 RCPs and multiple hydrologic models to evaluate the uncertainties. The ensemble got reduced for efficiency when running water management models. The projections of future water demand got finalized and also take uncertainty into account. Note that for flooding per say, statistical approaches are still considered for dam safety purposes.

Niels Nielsen : 15:28: Niels here. Under the original Columbia River Treaty, the USA paid for the construction of the three Canadian Dams and Canada, through BC Hydro got the benefit of free electricity. However, the three Canadian dams had to regulate flows to provide flood storage and balanced flows for downstream generation. A good example of providing compensation for flood management services. Now the original treaty has expired, recent discussions are more complex. It would be most interesting to find out how climate change is factored into present negotiations

Anton Schleiss : 15:36: There is an interesting court case in Brisbane regarding the floods January 2011. By a common action of all people who had damages (6 000), the dam owner was accused not to have considered weather forecast and consequently not released water before the flood peak from the reservoirs. In this January the common action was successful even if the owner was State of Queensland.

Anton Schleiss : 15:40: In Switzerland on the Upper Rhone River there has been implemented the MINERVE flood forecast system which manages 11 dams of different owners. In case of a forecasted large flood a crisis cell exceeds from the dam owners to make preventive release by turbines and bottom outlets based on flood reduction optimization model. At the end of the flood the dam owners are reimbursed of the lost water when the reservoir isn't full anymore at the end of the flood or a compensation of the financial loss when they had to sell electricity at low prices when doing preventive turbinning.

Niels Nielsen : 15:54: Hi Anton from Niels. The Wivenhoe Dam flood on the Brisbane River may have resulted in a slightly higher flood stage than if the dam had been operated "perfectly", but the real issue was that most of the inundated properties were well within the 100 year flood line and were below previous flood levels last century. The issue was that the construction of the Wivenhoe Dam was approved to both provide 50% water supply and 50% flood protection. This was assumed by the locals as preventing any flood! Local councils allowed building permits within the 100-year flood line.



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Alex Beckitt : 15:47: To Anton Schleiss - a case study from Switzerland on 'preventative turbinning' would seem valuable for this Annex IX activity?

Arun Kumar : 15:50: In India many of the dams specially in cascade are operated to reduced flood levels but are not compensated as most are owned by governments

Alex Beckitt : 16:29: Great session thanks!

The ideas of a White Paper "Hydropower providing flood control and drought management" was presented. The content could be:

- Intro about flood control, drought management and hydropower
- Theory and examples (as boxes) on how hydropower contributes to flood control and drought management
- Future needs for services like flood control and drought management
- The value of services like flood control and drought management (discussion)

Participants were encouraged to contribute to the White Paper.

Participants were also encouraged to present a paper on the topic of flood control and drought management from hydropower to the Hydro 2020 conference in Strasbourg 26-28 October (<https://www.hydropower-dams.com/hydro-2020/>)