

**Mitman, Jeffrey**

**From:** Mitman, Jeffrey *10R2*  
**Sent:** Friday, December 10, 2010 4:02 PM  
**To:** 'England, John' *US BR*  
**Cc:** Ferrante, Fernando  
**Subject:** RE: Can Hydro Turbine Generators Pass Water if the Grid is Unavailable

John, thanks.

Jeff

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**From:** England, John [<mailto:JEngland@usbr.gov>]  
**Sent:** Thursday, December 09, 2010 6:58 PM  
**To:** Mitman, Jeffrey  
**Subject:** Re: Can Hydro Turbine Generators Pass Water if the Grid is Unavailable

Hi Jeff-

Sorry I don't think I responded. Yes, typically no turbines are used when the grid is down. We always conduct sensitivity analyses of flood routings, including varying assumptions on low-level outlets and turbines to determine their effects on max res elevations.

Hope this helps.

-John

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**From:** Mitman, Jeffrey <[Jeffrey.Mitman@nrc.gov](mailto:Jeffrey.Mitman@nrc.gov)>  
**To:** England, John *10R2*  
**Cc:** Ferrante, Fernando <[Fernando.Ferrante@nrc.gov](mailto:Fernando.Ferrante@nrc.gov)>  
**Sent:** Wed Dec 01 13:23:42 2010  
**Subject:** Can Hydro Turbine Generators Pass Water if the Grid is Unavailable

John, as I hope you recall from our discussion at the May USBR Dam Safety Risk Analysis training, here at the NRC I've been working on the Jocassee Dam issue. I have a question on how hydroelectric turbine generators work. I'm hoping that if you cannot answer my question, that you can direct me to a contact who can.

The question is: Can a typical hydroelectric turbine operate if the local distribution grid is de-energized? The background for this question is as follows: The dam operator takes credit for passing water through the hydro turbine generators to prevent dam overtopping. I know from my nuclear background that steam turbines cannot pass steam if the unit is unloaded, i.e., if the generator is not connected to the grid. My concern is that in any PMP (or smaller events that are significant proportion of a PMP), a storm of this size has a very high probability of knocking out the grid. Without the grid to accept the electrical output from the hydro generator, I suspect that the hydro unit operator will have to stop flow through the turbine to prevent turbine over speed. Thus without the grid, the turbine generator will have to come off line and therefore, cannot be used to lower the reservoir level to prevent overtopping.

Your help in answering this question is appreciated. Thanks.

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