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Congress of the United States

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April 19, 2017

The Honorable Gene L. Dodaro
Comptroller General of the United States
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Dodaro:

We write to request that the Government Accountability Office (GAO) undertake a review of the Federal Energy Regulatory Commission's (FERC) Division of Dam Safety and Inspections, the FERC dam inspection process, and the role of FERC's Division of Dam Safety in evaluating dams and their related structures (*e.g.* spillways) during the hydroelectric re-licensing process. The recent failure at the Oroville Dam in California raises questions about deficiencies in FERC's safety program and concerns over the potential for severe property damage, injury and even possible loss of life.

According to the U.S. Army Corps of Engineers' National Inventory of Dams, there are more than 90,500 dams in the United States.[1] More than half of these dams were built prior to 1970 and have either exceeded their engineered lifespans or will in the near future.[2] FERC is responsible for maintaining safety at more than 2,500 dams across the country, over 900 of which have a hazard designation of "high" or "significant."[3]

The Army Corps lists dams as "high hazard" if a failure would result in human fatalities; the number of "high hazard" dams has increased over time because of development and

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[1] U.S. Army Corps of Engineers, *National Inventory of Dams* (nid.usace.army.mil/cm_apex/f?p=838:5:0::NO) (accessed Mar. 7, 2017).

[2] *Id.*

[3] Federal Energy Regulatory Commission, *Complete List of Active Licenses* (www.ferc.gov/industries/hydropower/gen-info/licensing/licenses.xls) (accessed Apr. 4, 2017); Federal Energy Regulatory Commission, *Presentation to the Commissioners by the FERC Office of Energy Projects, Division of Dam Safety and Inspections* (Nov. 17, 2016) (www.ferc.gov/industries/hydropower/safety/A-4-presentation.pdf).

population growth below them.[4] Climate change increases the risk of dam failure, especially in areas subject to increased episodes of intense, sustained rainfall.[5] Weather patterns are projected to become more erratic, characterized by more intense precipitation events with higher rainfall and seasonal shifts that result in mountain snowpack melting more rapidly straining the capacity of aging dams.[6]

The recent failure at the nation's tallest dam illustrates the major public safety and environmental threat posed by unsafe dam infrastructure. On February 7, 2017, a section of California's Oroville Dam "unexpectedly collapsed into the ground while water was being released from Lake Oroville."[7] The California Department of Water Resources (DWR) stopped flow in order to examine this damage while water levels in the reservoir continued to rise.[8] On February 11, water levels rose to 901 feet and flowed over the emergency spillway, a concrete wall designed as a last resort to lower the lake's level, causing severe erosion of the hillside abutting the spillway.[9] California DWR officials were concerned this could lead to further erosion that would undermine the barrier and cause it to collapse, causing catastrophic floods on the Feather River below. State officials issued an evacuation order on February 12 to residents of communities along the Feather River Basin, impacting almost 200,000 residents.[10] By February 14, the water level in the dam had been lowered by 15 feet from its peak and the evacuation order was lifted.

The Oroville Dam failure did not come without warning. In 2005, the Sierra Club, the Friends of the River, and the South Yuba Citizens League filed formal motions with FERC arguing that the agency should require the facility's licensees to install a concrete-lined emergency spillway as part of the relicensing of the dam.[11] FERC denied this motion, asserting that the emergency spillway was adequate to handle up to 350,000 cubic feet of water per second

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[4] *Risks Soar, Bills Come Due as 20th-Century Dams Crumble*, E&E News Greenwire (Mar. 6, 2017) (www.eenews.net/stories/1060050980).

[5] *Id.*

[6] *Oroville Dam Unprepared for Climate Change, Critics Warned Years Before Crisis*, Desert Sun (Feb. 14, 2017) (www.desertsun.com/story/news/environment/2017/02/14/dangerously-false-oroville-dam-isnt-prepared-global-warming-2008-lawsuit-says/97903842).

[7] *Lake Oroville Timeline: $100 million in damage, evacuees returning but more rain on the way*, Los Angeles Times (Feb. 14, 2017).

[8] *Id.*

[9] California Department of Water Resources, *Oroville Spillway Incident Overview. Lake Oroville Spillway Incident: Timeline of Major Events February 4-25* (Feb. 27, 2017) (www.water.ca.gov/oroville-spillway/pdf/2017/Lake%20Oroville%20events%20timeline.pdf).

[10] *Id.*

[11] *The government was warned that the Oroville Dam emergency spillway was unsafe. It didn't listen*, Washington Post (Feb. 14, 2017).

(cfs). A July 2006 memo from John Onderdonk, then a senior civil engineer for FERC, stated that the emergency spillway "would perform as designed" and that sediment resulting from erosion would be insignificant.[12] When California officials determined that the erosion could possibly undermine the emergency spillway barrier, the flow was only 12,000 cfs, less than four percent of what FERC asserted that the spillway could handle.[13]

As climate change alters weather patterns, the risk of similar failures rises significantly. The twin-pronged threat of aging dams and climate change presents a real crisis for dam safety in the United States. The Oroville incident suggests that FERC's process for reviewing and assessing dam safety facilities during the relicensing process may have serious deficiencies. Upgrading dams to survive severe weather events can be costly. There is often little immediate incentive for budget-strapped states and profit-minded private owners to make such an investment. However, the potential costs and loss of lives associated with a dam failure, particularly of the type that nearly occurred in the case of the Oroville Dam, would far exceed these costs. FERC has the responsibility to thoroughly examine the integrity of dams and their related facilities during the relicensing process. And, FERC has the authority to direct the licensee to address identified concerns as a condition of receiving a renewed license to continue operation.

To help Congress better understand the scope of FERC's Dam Safety and Inspections program and the standards FERC uses to evaluate the structural integrity and operating capacity during relicensing, we request that GAO conduct a review covering the following key issues:

1. What policies and procedures govern FERC's safety assessment of dams and related dam facilities during the relicensing process? What compliance, monitoring, and assurance provisions ensure safe and complete assessments are conducted?

2. What models, computer simulations, and other analytical tools are used by FERC to evaluate anticipated dam performance, establish ranges of safe operation for a dam and its associated facilities, and assess potential hazards in case of dam failure? How often are these performance assessment tools reevaluated, updated, and validated for accuracy? At least in the case of the Oroville dam emergency spillway, the actual performance of the spillway fell far short of its anticipated performance of 350,000 cfs. What are the major watershed variables used to assess the estimated performance of dam facilities in FERC's evaluations?

3. All watersheds undergo changes over time. To what extent does FERC take into account changing weather patterns, changes in hydrologic patterns, or altered morphology of the river, streams, and reservoir associated with the dam and hydropower facility due to

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[12] *Id.*

[13] *Emergency Spillway Used at Oroville Dam for First Time*, Mercury News (Feb. 11, 2017) (www.mercurynews.com/2017/02/11/emergency-spillway-used-at-oroville-dam-for-first-time/).

erosion, sedimentation, weatherization, seismic activity, or other natural phenomena during the re-licensing process? Does FERC review the engineering specifications relative to these changes during any time other than re-licensing or in the case of a dam facility failure?

4. Please provide a list of inspection and performance evaluation elements and a description of the reporting mechanism used to complete and submit all reports related to the annual inspection of high hazard dams.

5. Where FERC staff engineers find evidence of a safety failure, what consequences does the dam owner face, if any? Is there a deadline by which dam owners must resolve safety failures discovered?

6. Does FERC incorporate the information collected by its staff engineers into its relicensing decision? If so, how? If not, why not?

7. How does FERC evaluate the anticipated performance of a dam and its associated facilities during extreme events? How does FERC evaluate alternative assessments of dam and facility performance that may be submitted by different interested parties during re-licensing?

8. What are the respective roles and responsibilities of the licensee, the state, and FERC in the evaluation of the structural integrity and anticipated performance of a dam and its related facilities during the licensing and re-licensing process?

Thank you for your consideration and assistance with this request. Please contact Jean Fruci or Alexander Ratner with the minority committee staff at (202) 225-4407 to discuss the specific scope of work and a timeline for completing the request.

Sincerely,

Frank Pallone, Jr.
Ranking Member
Committee on Energy and Commerce

Bobby L. Rush
Ranking Member
Subcommittee on Energy

Anna G. Eshoo
Member of Congress

Diana DeGette
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