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IN FOCUS

Updated December 9, 2019

Dam Safety: Federal Programs and Authorities

In recent years, several incidents have highlighted the public safety risks posed by the failure of dams and related facilities. From 2015 to 2018, over 100 dams breached in North Carolina and South Carolina due to record flooding. In 2017, the near failure of Oroville Dam's spillway in California resulted in a precautionary evacuation of approximately 200,000 people and cost more than $1.1 billion in emergency response and repair. The 2019 failure of Spencer Dam in Nebraska resulted in the first dam-failure fatality in the nation since 2006. In response to these incidents, Congress may consider additional oversight and legislation that could improve dam safety.

This In Focus summarizes the U.S. dam inventory, rehabilitation and repair estimates, federal dam safety activities, and related issues for Congress. For more detailed information, see CRS Report R45981, *Dam Safety Overview and the Federal Role*.

National Inventory of Dams

The National Inventory of Dams (NID)—maintained by the U.S. Army Corps of Engineers (USACE)—catalogs information from 50 states, Puerto Rico, and federal agencies on most of the nation's dams. The NID lists more than 90,000 dams. Federal government agencies (e.g., USACE, U.S. Forest Service) report owning approximately 3% (2,717) of the dams in the NID, including some of the largest dams in the United States. The majority of NID-listed dams are owned by private entities, state and local governments, and public utilities. Although states have regulatory authority for more than 69% of NID-listed dams, the federal government plays a key role in dam safety for both federal and nonfederal dams.

Of the dams in the NID, about 17% (15,629) are classified as *high hazard potential* (i.e., the loss of at least one life is likely if the dam fails). The overall number of dams classified as high hazard potential has increased in the past decade (mostly due to development around dams, not new construction of dams). The NID also includes dams that are deemed not a risk human life: *significant hazard potential* dams could cause economic loss or environmental damage, and *low hazard potential* dams could pose limited risk and must meet a size threshold.

Dam Rehabilitation and Repair Needs

Dams were built to engineering and construction standards and regulations corresponding to the time of their construction. Over half of the dams with information on their age reported in the NID were built more than fifty years ago. Some dams, including older dams, may not meet current dam safety standards, which have evolved over time as scientific data and engineering have improved. In 2018, the NID listed about 2,384 high hazard potential facilities with structural ratings of *poor* or *unsatisfactory*, meaning they were in need of rehabilitation (i.e., to bring up to standard) or repair.

The Association of State Dam Safety Officials estimated that the total cost to rehabilitate nonfederal and federal dams in the NID would exceed $70 billion. Of this estimate, the cost to rehabilitate high hazard potential dams is $3 billion for federal dams and $19 billion for nonfederal dams.

What Is the Federal Role?

The federal role in dam safety encompasses: (1) support for state dam safety efforts; (2) support for federal dam safety; (3) regulation of certain nonfederal dams, and (4) rehabilitation and repair for certain nonfederal dams.

Support for State Dam Safety

Every state (except Alabama) has established a regulatory program for dam safety, as has Puerto Rico. State dam safety programs typically include safety evaluations of existing dams, review of plans and specifications for dam construction and major repair work, periodic inspections of construction work on new and existing dams, reviews and approval of environmental action plans, and emergency preparedness activities with local officials and dam owners. The dam owners ogenerally are responsible for the safety, rehabilitation, and repair of their dams; selected states provide a limited amount of assistance for these activities.

The main source of federal support for state dam safety programs is the National Dam Safety Program (NDSP), operated by the Federal Emergency Management Agency (FEMA). Authorized in 1996 by the National Dam Safety Program Act, as amended (33 U.S.C. §§467f et seq.), NDSP activities include providing dam safety information resources and training, facilitating information exchanges, and supporting state dam safety programs with grant assistance. FEMA distributes around $7 million annually in dam safety program grants to 49 states and Puerto Rico to support their dam safety activities.

Support for Federal Dam Safety

The federal government has statutory responsibilities for the monitoring, upkeep, rehabilitation, and repair of federally owned dams. The major federal water resource management agencies, USACE and the Bureau of Reclamation (Reclamation), own 42% (1,153) of federal dams, including many large dams:

- USACE operates more than 700 dams, many with a primary purpose of flood risk reduction. USACE implements a dam safety program consisting of inspections and risk analyses for all USACE dams that indicate the level of investment needed. In FY2018, USACE funded $268 million in work on 10 dam safety

construction projects and funded dam safety studies at 39 projects. As of FY2019, USACE estimated a backlog of $20 billion for dam safety rehabilitation and repair.

- Reclamation owns more than 400 dams in the 17 states west of the Mississippi River. Reclamation's dam safety program provides inspections and authorizes rehabilitation and repairs to qualifying projects at Reclamation dams. In FY2019, Congress appropriated $71 million to fund 18 dam safety projects. As of FY2019, Reclamation estimated that the current portfolio of dam safety modification projects through FY2030 would cost between $1.4 billion to $1.8 billion.

The remaining federal dams are owned by the Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service, Department of Defense, Bureau of Indian Affairs, Tennessee Valley Authority, Department of Energy, and International Boundary and Water Commission. In overseeing these dams, federal agencies follow FEMA's Federal Guidelines for Dam Safety.

Federal Regulation of Nonfederal Dams

Congress has enacted legislation to regulate selected nonfederally owned dams, including hydropower projects, certain mining activities, and nuclear facilities and materials. These nonfederal facilities and activities may use dams for certain purposes. For example, the Federal Energy Regulatory Commission (FERC) has the authority to issue licenses for the construction and operation of nonfederally owned hydroelectric projects, which may include dams. FERC staff inspect regulated dams at regular intervals, and the owners of certain dams are required to conduct more thorough inspections. If a deficiency is found, FERC would require the project owner to remediate the deficiency and may require immediate risk-reduction measures (e.g., reservoir drawdowns). Other federal agencies regulating nonfederal dams include the Mine Safety and Health Administration, the Office of Surface Mining Reclamation and Enforcement, and the Nuclear Regulatory Commission.

Rehabilitation and Repair of Nonfederal Dams

In FY2019, Congress appropriated $10 million for FEMA's High Hazard Dam Rehabilitation Grant Program, which was authorized by the Water Infrastructure Improvements for the Nation Act (P.L. 114-322) to provide funding assistance for the repair, removal, or rehabilitation of eligible high hazard nonfederal dams. Congress authorized the program to provide technical, planning, design, and construction assistance in the form of grants to nonfederal sponsors. FEMA may provide assistance with non-disaster grants (e.g., Preparedness Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program) to reduce the flood damage that a dam failure could cause, or it may provide grants for these purposes after a presidentially declared disaster (e.g., Hazard Mitigation Grant Program and Public Assistance Program).

Separately, the U.S. Department of Agriculture (USDA) has authority under the Watershed Rehabilitation Program (P.L. 106-472, as amended) to provide financial and technical assistance for the planning, design, and implementation of dam rehabilitation projects (including upgrading or removal). To be eligible for assistance, dams must have been built using selected USDA funds and must now pose a public health or safety concern. The program covers up to 65% of the total rehabilitation cost. Since the program was first authorized in 2000, Congress has appropriated more than $700 million for these projects through FY2019.

The USACE Rehabilitation and Inspection Program (RIP, or the P.L. 84-99 program) is primarily used for levees but also provides federal support for nonfederal dams that meet certain criteria (e.g., storage capacity for a 200-year flood event). RIP may provide assistance for flood control works if a facility is damaged by floods, storms, or seismic activity. As part of RIP, USACE periodically inspects participating facilities to ensure their owners are meeting USACE maintenance standards (USACE considered 33 dams active in RIP in 2017). Because annual appropriations for RIP typically are insufficient to address numerous or costly repairs, major repairs under this authority sometimes are provided through supplemental appropriations acts.

Issues for Congress

Congressional support for the federal role in dam rehabilitation and repair traditionally has been focused on rehabilitation of federal facilities and support for state dam safety programs. Some have argued for an increased federal role in nonfederal dam safety due to the potential loss of lives and the large federal outlays in emergency spending that might be necessary if a dam failure were to occur. However, some may argue against encroaching on state and local sovereignty (for example, land use and zoning authority) and against the potential growth of the federal government's role.

Congress may evaluate the level and allocation of appropriations to federal dam safety programs, project modifications of federal dams, and financial assistance for both nonfederal dam safety programs and nonfederal dams. Individual dam rehabilitation and repair costs can range from thousands to hundreds of millions of dollars; many nonfederal dam owners are not willing or able to fund these costs. Congress may consider the tradeoffs in focusing federal resources on nonfederal dams versus federal dams, for which several agencies have stated financial need for rehabilitation and repair.

Congress may revisit current policies for the disclosure of dam safety information when considering the federal role in providing dam safety risk and response information to the public (including those living downstream of dams) while maintaining security of these structures. According to some advocacy groups, many Americans are unaware that they live downstream of a dam. Dam safety processes and products (e.g., inspections, emergency action plans, and inundation maps) are intended to support decisionmaking and enhance community resilience. Some of these products may not be readily available to all community members because such information generally is restricted from public access.

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IF10606

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