



American Society of Civil Engineers

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Testimony of
The American Society of Civil Engineers
Before the Subcommittees on
Economic Development, Public Buildings,
and Emergency Management
and
Water Resources and Environment
of the
House Committee on Transportation and Infrastructure
on
National Levee and Dam Safety Programs
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Mr. Chairmen and Members of the Subcommittees:

Good morning. I am Larry Roth, the Deputy Executive Director of the American Society of Civil Engineers (ASCE).^{*} I am a licensed Professional Engineer and a licensed Geotechnical Engineer in the state of California. Before joining the ASCE staff, I had 30 years' experience in water resources engineering, including dams, levees, and canals.

Let me start by thanking you for holding this hearing. As someone who has worked in this field for many years, I can say that there are few infrastructure issues of greater importance to more Americans today than dam and levee safety.

So I am very pleased to appear today to testify for ASCE in strong support of **H.R. 1098, the Dam Rehabilitation and Repair Act of 2007**, which would amend the National Dam Safety Program Act to provide critically needed funding for repairs to publicly owned dams across the United States.

ASCE also supports enactment of a national levee safety program modeled on the National Dam Safety Program. We believe that **H.R. 1587, the National Levee Safety Program Act of 2007**, includes all of the necessary components for a vital nationwide levee safety program.

I. Dam Conditions

Like all man-made structures, dams deteriorate. Deferred maintenance accelerates deterioration and causes dams to be more susceptible to failure. As with other critical

^{*} ASCE, founded in 1852, is the country's oldest national civil engineering organization. It represents more than 140,000 civil engineers in private practice, government, industry, and academia who are dedicated to the advancement of the science and profession of civil engineering. ASCE is a 501(c) (3) non-profit educational and professional society.

infrastructure, a significant investment is essential to maintain the benefits and assure the safety that society demands.

In 2005, ASCE issued the latest in a series of assessments of the nation's infrastructure. Our *2005 Report Card for America's Infrastructure* found that the number of unsafe dams in the United States rose by a stunning 33 percent between 1998 and 2005. There are now more than 3,300 unsafe dams nationwide.

Moreover, the nation's dam safety officials estimate that it would cost more than \$10 billion over the next 12 years to upgrade the physical condition of all critical non-federal dams — dams that pose a direct risk to human life should they fail.

The problem of hazardous dams is potentially enormous. As the Congressional Research Service (CRS) stated last September, unsafe dams represent a serious risk to public safety. The CRS study said: "While dam failures are infrequent, age, construction deficiencies, inadequate maintenance, and seismic or weather events contribute to the likelihood [of failure]. To reduce the risk, regular inspections are necessary to identify deficiencies and then corrective action must be taken."

Although catastrophic failures are rare, the states reported 1,090 dam safety incidents — including 129 failures — between 1999 and 2006. A number of factors, including age, construction deficiencies, inadequate maintenance, and seismic or weather events, contribute to the likelihood of dam failure, according to the CRS.

The recent dam failures in Hawaii, Missouri, New Jersey and New Hampshire, and the near failure in Massachusetts in 2005 have brought into tragic focus the potential consequences of aging and unsafe dams. Recent extreme rainfalls in the Northeast this spring brought further attention to the vulnerability of dams in New Jersey, and Pennsylvania.

The number of high-hazard dams — dams whose failure would cause loss of human life — is increasing dramatically. By 2005, the number of high-hazard-potential dams totaled more than 11,000 nationally. As downstream land development increases, so will the number of high-hazard potential dams. As these dams often require major repair to accommodate more stringent inspection, maintenance and design standards, financial support for state dam safety programs must keep pace.

Even more alarming, states presently report more than 3,300 "unsafe" dams, which have deficiencies that leave them more susceptible to failure. Many states have large numbers of unsafe dams, including Pennsylvania (325), New Jersey (193), and Ohio (825). The actual number is potentially much higher; some state agencies do not report statistics on unsafe dams.

The combined effect of rapid downstream development, aging or non-compliant structures, and inadequate past design practices—coupled with a predicted increase in extreme events—demands fully funded and staffed state dam safety programs, as well as substantial and proactive funding for dam repairs.

II. Dam Rehabilitation and Repair

The National Dam Safety and Security Act of 2002, as amended by the Dam Safety Act of 2006, provides funding through grants and has improved state dam safety programs. Unfortunately, it does not provide financial assistance for needed repairs. To be sure, some progress is being made through the repair of small watershed dams constructed with assistance from the Natural Resources Conservation Service in the Department of Agriculture. But this is only a small portion of the total number of non-federal dams. On the federal side, federally owned and federally regulated hydropower dams are in good condition; however, continuing budget restrictions and increased attention to security are placing pressure on and limiting many agency dam safety programs.

We need to establish programs by which the federal government can carry out its legitimate task in protecting the public safety and welfare from obsolescent dams. We know that the 83,000 dams in the U.S. National Inventory of Dams continue to age and deteriorate, yet there is no national funding program to fund the repair of unsafe dams.

According to results of a study by the Association of State Dam Safety Officials, the total investment to bring U.S. dams into safety compliance or to remove obsolete dams tops \$30 billion.

That is why the bill sponsored by Representatives John Salazar and Randy Kuhl, **H.R. 1098, the Dam Rehabilitation and Repair Act of 2007**, is so badly needed. The bill would provide a modest \$200 million over five years for the repair, rehabilitation, or removal of non-federal, high-hazard, publicly owned dams. ASCE strongly recommends that federal and state legislation like H.R. 1098 be enacted to provide a funding source for repair and rehabilitation of dams in the United States.

In addition, ASCE supports —

- Enactment of state and federal regulations and legislation to protect the health and welfare of citizens from the catastrophic impact of dam failure. The federal government must accept the responsibility for the safety of all federal dams and federally regulated dams.
- Adequate funding for federal agencies, including the Departments of Defense and Interior, in order to operate and maintain federal dams and to provide them with sufficient security improvements.
- A fully funded National Dam Safety Program, administered by the DHS, which provides leadership through technical assistance from federal agencies and funding to assist states with assuring the safety and security of state-regulated dams.

III. The National Dam Safety Program

Congress has been committed to dam safety for more than 30 years. It enacted the National Dam Inspection Act of 1972, which created the National Inventory of Dams

(NID). The NID, last updated in 2005, now lists more than 83,000 U.S. dams of varying purposes, ownership, and condition. More than half are privately owned; less than five percent are owned by the federal government.

In 1974, Congress approved the first comprehensive federal system for enhancing dam safety through the National Dam Safety Program Act.

The National Dam Safety Program, administered by the Director of the Federal Emergency Management Agency (FEMA), applies to federal and non-federal dams. Although the legislation targets dams at least 25 feet high and impounding at least 25 acre-feet of water, it can encompass any barrier that FEMA determines is likely to pose a significant threat to human life or property if the barrier fails.

One of the final actions of the 109th Congress was to reauthorize the National Dam Safety program for five years by enacting Public Law 109-460.

IV. History of the National Dam Safety Program

FEMA has the authority to establish an advisory National Dam Safety Review Board to advise and assist the Director on implementation of the program. The legislation also established an Interagency Committee on Dam Safety (ICODS) to encourage the establishment and maintenance of effective federal and state programs, policies, and guidelines intended to enhance dam safety for the protection of human life and property. FEMA, in consultation with ICODS and state dam safety agencies, and the Board are responsible for establishing and maintaining a coordinated national dam safety program.

The objectives of the program are to ensure that new and existing dams are safe through the development of technologically and economically feasible programs and procedures for national dam safety hazard reduction; encouragement of acceptable engineering policies and procedures to be used for dam site investigation, design, construction, operation and maintenance, and emergency preparedness; encouragement of the establishment and implementation of effective dam safety programs in each state based on state standards; development and encouragement of public awareness projects to increase public acceptance and support of state dam safety programs; development of technical assistance materials for federal and non-federal dam safety programs; and development of mechanisms with which to provide federal technical assistance for dam safety to the non-federal sector.

The U.S. Army Corps of Engineers continues to have the authority to carry out a national program of inspection of dams originally authorized in August 1972, and now incorporated in the National Dam Safety Program. But this Corps inspection program is currently unfunded and inactive because of the establishment of state programs for inspection of non-federal dams.

Under this authority, the Corps can inspect all dams in the United States (as defined by the legislation) except those under the jurisdiction or authority of certain other federal agencies, certain dams inspected by state agencies which the governor requests be

excluded from the inspection, and those dams which the Secretary of the Army determines do not pose any threat to human life or property.

The Secretary of the Army would immediately notify the governor of the state in which a dam is located of any hazardous conditions found during an inspection and may, under these circumstances and at the request of the owner, perform detailed engineering studies to determine the structural integrity of the dam. The Corps updates the National Inventory of Dams every two years depending upon the availability of appropriated funds. As we stated previously, the last update occurred in early 2005.

V. National Levee Safety Program

ASCE supports the enactment of federal and state legislation and regulations to protect the health and welfare of citizens from the catastrophic effects of levee failures. Congress should enact legislation to establish a national levee safety program that is modeled on the successful National Dam Safety Program.

The federal government must accept the responsibility for the safety of all federally funded and regulated levees. Similarly, state governments must enact legislation authorizing an appropriate entity to undertake a program of levee safety for non-federal levees. The act should require the federal and state governments to conduct mandatory safety inspections for all levees and establish a national inventory of levees.

A. Inventory

The government needs to create a central levee inventory. At a minimum, the data base should include the location, date of construction, local sponsor of the original project, and current physical condition based on the most recent inspection.

The inventory is essential. The federal government needs to account for every federal, state, local, and privately owned levee in the country. Without such an all-inclusive inventory, there is a risk of missing potentially life-threatening conditions at levees that are not registered by the government.

B. Inspections

The government needs to establish a program to inspect every levee that has been wholly or partly constructed with federal funds. This would apply to any levee under the control of any federal agency that designs, finances, constructs, owns, operates, maintains, or regulates the construction, operation, or maintenance of a levee. Federal inspections need to be conducted at least once every five or 10 years. Federal inspections may be carried out at every state-funded levee at the governor's request.

In setting priorities, the inspections should first be carried out at those levees where the federal government determines that the levee poses an imminent and substantial threat to human life and property through failure.

Whether a levee constitutes an imminent and substantial threat to human life or property will be based on the possibility that the levee may be in danger of failing due to disparities in floodwall height or construction materials, overtopping due to storm surges, seepage, settlement that alters the design elevation of the levee, piping or internal erosion, sediment, cracking, earth movement, earthquakes, hurricanes, the failure of floodwalls or sheet walls, flashboards, gates on conduits, or other conditions that exist or may occur in any area in the vicinity of the levee.

C. Financial aid

The legislation should authorize federal financial assistance for the rehabilitation of existing levees wholly or partially funded by the federal government. The term “rehabilitation” means the repair, replacement, reconstruction, or removal of a substandard levee. The authorization also should fund state levee safety programs where there is an imminent and substantial threat to human life, property, or public safety.

D. Independent Peer Review

The national levee safety program legislation should require that the design of every levee project or significant modification to an existing levee system must undergo outside peer review whenever (1) performance is critical to the public health, safety and welfare; (2) reliability of performance under emergency conditions is critical; (3) the design calls for using innovative materials or techniques; or (4) the project design is lacking in redundancy—that is, the project lacks a built-in failure-resistant system to prevent total design or operational failure—or the project has a unique construction sequencing or a short or overlapping design construction schedule.

An independent project peer review should occur throughout the design process if any of these four principles applies to the levee project. The peer review ought to be conducted on each project regardless of cost.

E. State levee safety programs

The legislation should require the creation of a federal program to assist the states in the establishment of their own levee safety programs. At a minimum, there should be a levee safety program for every state in which a state agency has designed, financed, built, owned, operated, or maintained a levee.

To qualify for federal aid, the state must have a federally approved levee safety program in place that approves plans and specification for the construction or removal of levees; performs periodic inspections, requires inspections every five years for levees that may pose a substantial threat to human life and public property in the event of a failure; requires all state inspections to be carried out by a licensed Professional Engineer; and provides money to assure timely repairs to these levees.

A bill introduced by Mrs. Schmidt of Ohio would satisfy virtually all of these important requirements. The National Levee Safety Program Act of 2007 (H.R. 1587) contains the necessary elements of a sound, well-balanced levee safety program for the nation.

The bill does not contain a requirement for independent peer review of levee engineering or a financial aid program to repair or replace aging or deficient levees, however, and we encourage you to consider including these in the final bill.

Thank you, Mr. Chairman. That concludes my statement. I would be pleased to answer any questions that you may have.

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