



2012 Annual Year-in-Review

National Dam Safety Program
Year-in-Review 2012: Setting the Stage

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Cover Photo:

Center Hill Dam, Tennessee, Tennessee Valley Authority

National Dam Safety Program Year-in-Review 2012: Setting the Stage

Since the National Dam Safety Program was first authorized by Congress in 1996, there have been marked improvements in the safety of many of our Nation's dams. This is directly attributable to what the Program has been able to achieve since its inception.

This *Year-in-Review* provides the National Dam Safety Program's (NDSP's) progress in 2012 along with important accomplishments that continue across all Program elements, including State assistance, research, training, and the alignment of the Program within the emergency management and resilience frameworks. Beginning this year, it is the Federal Emergency Management Agency's (FEMA's) plan to highlight key Program accomplishments on a yearly basis to advance awareness and understanding of the important role the Program plays to reduce risk, promote benefits, and enhance safety surrounding our Nation's dams.

National Dam Safety Program Highlights

During 2012, many important accomplishments were achieved, and a few are highlighted below:

- On May 31, 2012, FEMA participated in *National Dam Safety Awareness Day*. It kicked off with a commemorative ceremony at Lake Needwood in Montgomery County, MD, remembering the 1889 Johnstown, PA Flood where 2,209 lives were lost. FEMA also announced its new *Strategic Plan for the National Dam Safety Program*, which was released in October 2012.



Lake Needwood

- +In 2012, FEMA began to develop *GeoDam-BREACH*, a geographic information system (GIS) toolset that provides users with a cost effective way to develop consistent, simplified inundation studies and Emergency Action Plans (EAPs). This was driven by the National Dam Safety Review Board (NDSRB) recommendation for States to have EAPs for all high-hazard potential dams.
- +FEMA also developed the *Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures*, which will be published in 2013. These guidelines will provide information for Federal and State agencies, along with local communities, dam owners, and emergency management officials, on how to reduce flood hazard risks associated with dams.

The National Dam Safety Program Mission and Vision: Collaboration Is Key

In October 2012, FEMA and its partners, the NDSRB and the Interagency Committee on Dam Safety (ICODS), presented the *Strategic Plan for the National Dam Safety Program (NDSP) for Fiscal Years 2012–2016*. This strategic plan establishes a clear framework to accomplish the mission and vision of the NDSP over the course of the next 4 years.

National Dam Safety Program Vision:

The benefits and risks of dams are understood, and risks are managed to improve public safety, economic strength, national security, and to sustain the environment.

National Dam Safety Program Mission:

Reduce risks to life, property, and the environment from dam failure by guiding public policy and leveraging industry best practices across the dam safety community.

A Look Back on 2012: Getting Set for the Future

2012 was a formative year for a number of key initiatives that will help define the NDSP for years to come. In the *Fiscal Year 2008 to 2011 Progress Report on the National Dam Safety Program*, a number of strategies were identified to help realize the vision and mission for the Program and to reduce the risk to the American public from dam failure:

- +Promote community and regional resilience
- +Increase awareness of dams by the downstream public
- +Increase the number and updates of EAPs
- +Assess the risk associated with dams
- +Increase inspections of dams
- +Increase the number of stakeholders trained about dam safety
- +Translate research products into training and expand the research program
- +Achieve the participation of all States in the Program

The accomplishments of NDSP members in 2012 are key to the successful implementation of these strategies.

In accordance with the Indian Dam Safety Act of 1994 (Public Law 103-302), the Bureau of Indian Affairs (BIA) is responsible for all dams on tribal lands. There are 910 dams on Indian reservations, 136 of which are classified as high- and significant-hazard potential

COLLABORATION: Key to Program Success

The collective membership of the NDSRB and ICODS includes representatives from the following agencies and groups:

- FEMA, the NDSP lead agency
- Department of Energy
- Department of the Interior
- The Federal Energy Regulatory Commission
- International Boundary and Water Commission
- Nuclear Regulatory Commission
- Tennessee Valley Authority
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture
- Department of Labor
- States
- Private Sector

dams. The BIA Safety of Dams Program works with Indian tribes to maintain these dams and reduce the potential loss of human life and property damage due to catastrophic dam failure by making BIA dams as safe as practically possible. For more information on the BIA Safety of Dams Program visit <http://www.bia.gov>.

State Success Stories

From the Association of State Dam Safety Officials:

Dams are a critical part of our Nation's infrastructure, and all Americans enjoy the benefits they provide, including flood protection, water supply, hydropower, irrigation, and recreation. However, our dams are aging and many are deteriorating, while downstream and upstream populations are increasing.

Everyone has a role to play in creating a future where all dams are safer, including dam owners, engineers, community planners/leaders, and Federal and State regulators: it's a shared responsibility. Across the country, State dam safety programs inspect existing dams, oversee remediation of deficient dams, and work with local officials and dam owners on emergency preparedness and mitigation of downstream risk to development. Knowledgeable and dedicated officials lead these programs, yet they are facing major challenges because of inadequate budgets, staffing, and in some cases, the authority to ensure public safety. The NDSP and State Assistance Grants play a valuable role in helping State dam safety programs fulfill this important mission.

States can also point to a number of State Assistance Grant success stories, which are highlighted below:

Increased Number of Emergency Action Plans for High-Hazard Potential Dams

- +Nationally, the percentage of high-hazard potential dams with an Emergency Action Plan (EAP) increased from 35 percent to 66 percent between 1999 and 2011.
- +From 1999 to 2011, nearly every State has shown marked improvement in the number of EAPs for high-hazard potential dams, with no States showing a significant decrease.
- +In 2011, 21 States reported percentages of high-hazard potential dams with an EAP being 90 percent or greater, up from just 10 States in 1999.

Condition of Dams Reporting Improves the National Understanding of Where Rehabilitation is Most Needed

- +Nine States have reported the condition of 100 percent of their high-hazard potential dams to the U.S. Army Corps of Engineers' National Inventory of Dams (NID). Additionally, 30 States have reported the condition of more than 75 percent of their high-hazard potential dams to the NID.
- +From 2009 to 2010, there was a 26 percent increase in high-hazard potential dams with a reported condition rating and a 19 percent increase—from 34 percent to 53 percent—in high-hazard potential dams with either a satisfactory or fair rating. The percentage of high-hazard potential dams with condition ratings of poor and unsatisfactory (i.e., those in need of remediation) also increased from 7 percent to 14 percent as more dams were rated.



Concrete deterioration

State Assistance Grants: Success Stories

Many States use NDSP State Assistance Grants to:

- +Hire staff or consultants to complete inspections of high-hazard potential dams; prepare EAPs, dam failure analyses, and inundation maps; develop database applications; and populate the condition assessment field in the NID.
- +Purchase equipment to facilitate periodic inspections, such as in-pipe cameras, all-terrain vehicles (ATVs) and four-wheel-drive vehicles, computers, and Global Positioning Systems (GPSs).
- +Conduct owner education and outreach workshops, many of which focus specifically on EAP development.

The following describe several State successes with their NDSP State Assistance Grants:

Ohio. Ohio dam safety staff trained eight county Soil and Water Conservation District (SWCD) offices on writing EAPs for significant- and low-hazard potential dams using a “fillable EAP” template. When writing an EAP, SWCD staff members met with the dam owner and county emergency management agency. Dam owners in each of the eight counties that needed an EAP were contacted by letter to remind them of the need for an EAP. The letter provided information regarding obtaining an EAP free of charge from the SWCD.

The Ohio Dam Safety Program has received several draft EAPs from these counties and has approved approximately 12 to date. With this program, Ohio has put more EAPs in place, while also increasing the involvement of county SWCD staff. Further, SWCD staff now have a better understanding of dam safety, Ohio’s requirements, and EAPs, which allows them to provide greater assistance in the event of an emergency.

Texas. Texas has used grant funds over the last 7 years to increase the number of inspections and EAPs for high-hazard potential dams in Texas. In 2004, the small staff was able to conduct only 65 inspections. To increase dam inspections, the State used grant funds to contract with consultants and the Natural Resources Conservation Service (NRCS) to inspect high- and significant-hazard potential dams. By 2010, the State was able to conduct 290 inspections of high-hazard potential dams. In 2011, 251 inspections were completed. The State dam safety program has now received State funds to hire staff to increase the number of inspections.

In 2008, only 17 percent of high-hazard potential dams had an EAP. In 2009, Texas passed rules requiring EAPs for all high- and significant-hazard potential dams; Texas used NDSP grant funds to retain a consultant to perform simplified breach studies for use in EAPs. Grant funds were also used to host workshops on EAPs and distribute mailings. As a result of these efforts, 65 percent of the State’s high-hazard potential dams had an EAP as of 2011.

Virginia. Virginia developed a process for estimating costs and prioritizing dam safety rehabilitation needs and then used the process to develop a report to the Governor titled, “Costs, Funding, and Prioritization of Virginia Dams to Meet Minimum Public Safety Standards.” The report identifies dams in need of repair and provides an estimate of the repair cost needed to meet public safety standards. As a result, the Governor recommended, and the Legislature approved, \$14 million for the repair of State-owned high-hazard potential dams.

Increasing Dam Safety Public Awareness

Living with Dams: Know Your Risks brochure.

This brochure, published in May 2012 and updated in February 2013, is the first NDSP publication targeted toward communicating dam safety risks to the general public. It provides information for the public on the benefits and risks associated with dams and how to prepare for and mitigate dam hazard risks.

Interagency and Scientific Community Collaboration

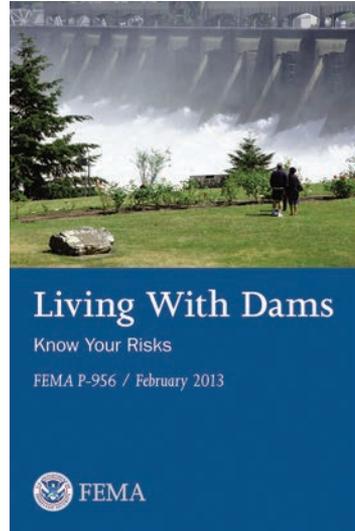
Pocket Safety Guide for Dams and Impoundments.

This pocket guide is the result of a partnership between FEMA and the U.S. Forest Service National Technology and Development Program to produce a communications tool that promotes and increases dam/impoundment safety in Federal land management agencies and private owners.

National Academy of Sciences Study on Dam and Levee Safety and Community Resilience. Through this study, published in 2012, the National Research Council examined the policy, economic, and human behavioral drivers that promote or inhibit the expansion of dam and levee hazard mitigation and safety programs to promote community resilience.

Training

Consequences of Dam Failure Workshop. This workshop, conducted at the Emergency Management Institute on May 7-8, 2012, was designed to enhance dam safety and emergency management officials' understanding of technologies and methodologies to estimate the impacts of dam failure on human life and property in downstream communities. The information presented during the workshop can be incorporated into State and local emergency preparedness plans, response planning, and recovery efforts.



Updated Policies and Guidance

Water Policy Collaborative Evaluation. FEMA funded an evaluation of all components of the NDSP performed by the Water Policy Collaborative, Department of Civil and Environmental Engineering, Clark School of Engineering, University of Maryland. The recommendations from the evaluation team are now being implemented to help guide the long-term direction of the Program.

FEMA P-919, Summary of Existing Guidelines for Hydrologic Safety of Dams. This summary publication documents the present state of the practice for evaluating the hydrologic safety of dams. It includes an inventory of current practices used by State and Federal agencies. This document also includes a review of hydrologic guidelines currently used by each State and Federal agency that owns or regulates dams.

GeoDam-BREACH Toolset. The NDSP developed a new GIS toolset named Geospatial Dam Break, Emergency Action Planning, Consequences and Hazards (GeoDam-BREACH). This tool enables users to develop simplified dam break inundation zones, facilitates the efficient development of EAPs, and supports the goals of FEMA's Risk MAP Program by facilitating the creation of non-regulatory Risk MAP datasets and consequence assessments for dam safety.

FEMA 64, Federal Guidelines for Dam Safety: Emergency Action Planning for Dams. The NDSP completed an update of FEMA 64 to bring the guidance into current emergency practice and DHS/FEMA language, including the use of the Homeland Security Exercise and Evaluation Program. The guidance emphasizes the importance of collaboration between dam owners and emergency management authorities in developing, exercising, and implementing EAPs. The updated FEMA 64 will be published in 2013.

FEMA 94, Selecting and Accommodating Inflow Design Floods for Dams Update. The main objectives of this document are to recommend appropriate procedures for selecting and accommodating the Inflow Design Flood for dams based on current and accepted practices and to promote a reasonable degree of consistency and uniformity among State and Federal agencies. The updated FEMA 94 will be published in 2013.

Filters for Embankment Dams: Best Practices for Design and Construction.

This document provides procedures and guidance for best practices concerning embankment dam filter design and construction. It represents an effort to collect and disseminate current information and experience where a technical consensus has been reached. *Filters for Embankment Dams* is a technical publication meant for those familiar with embankment dams, such as designers, inspectors, construction oversight personnel, and dam safety engineers.

National Dam Safety Review Board and Interagency Committee on Dam Safety: The Work Continues

The NDSRB and ICODS will continue to meet on a quarterly basis. Future activities it hopes to accomplish include:

- +Develop a playbook for use by State dam safety programs, FEMA Regions, and the FEMA National Flood Insurance Program. It will include conversations with professionals and present available products, including sample dam operation plans.
- +Share NID data with FEMA Regions, and State and local officials.
- +Work through partners and appropriate communications channels for information distribution.
- +Expand National Dam Safety Awareness Day activities in future years to more States, and eventually, all 50 States.
- +Deliver “Dam Safety 101” training to a wider audience, including dam owners, emergency managers, and the general public.
- +Support or participate in dam safety and awareness events (where feasible), such as International Commission on Large Dams (ICOLD) and other events to spread the dam safety awareness message.





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