Catalog of FEMA Dam Safety Resources

FEMA P-732 / August 2008

FEMA

NDSP
National Dam Safety Program

Table of Contents

Publications

Federal Guidelines for Dam Safety 1

Technical Manuals and Reports 4

Dam Owner Guides 7

Policy Papers and Guidelines 8

National Dam Safety Program 9
Research Needs Workshop Reports

Brochures 13

Training Aids, Videos, and Software 15

Resource List 17

Note: A legend will appear on the bottom of alternating pages.

Available Online Available in Print

Available on CD-ROM or DVD Available in Video

Please visit
http://www.fema.gov/plan/prevent/damfailure/publications.shtm
to view or download publications.

Ordering Information

To order publications from this catalog, please call
1-800-480-2520 or fax 301-362-5335.

Cover Photo Courtesy of:

International Boundary and Water Commission
Amistad Dam, Texas

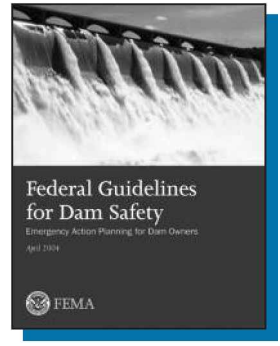
Publications

Federal Guidelines For Dam Safety

In June 1979, the *ad hoc* interagency committee on dam safety (ICODS) issued the first guidelines for federal agency dam owners (*Federal Guidelines for Dam Safety, FEMA 93*). To supplement the *Federal Guidelines for Dam Safety*, ICODS has prepared and approved federal guidelines in the areas of emergency action planning; earthquake analyses and design of dams; selecting and accommodating inflow design floods for dams; and hazard potential classification system for dams. ICODS also has published a glossary of terms to accompany the guidelines.

Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners (FEMA 64)

There are many types of emergency events that affect dams. Whenever people live in areas that could be flooded from a dam failure, there is the potential for loss of life and damage to property. The purpose of these guidelines is to encourage thorough and consistent emergency action planning for dams to help save lives and reduce property damage. The guidelines cover basic considerations for preparing an Emergency Action Plan (EAP); the six basic elements of an EAP; and the suggested format for an EAP.



FEMA 64

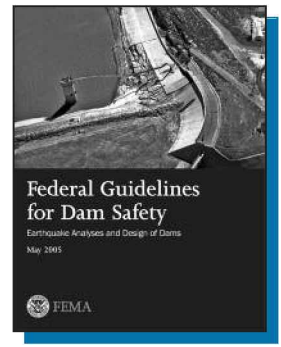
The CD-ROM, FEMA 93CD, 2005, contains all of the Federal Guidelines for Dam Safety: FEMA 64; FEMA 65; FEMA 93; FEMA 94; FEMA 148; and FEMA 333.

Available Online

Available on CD-ROM or DVD

Available in Video

Federal Guidelines for Dam Safety: Earthquake Analyses and Design of Dams (FEMA 65)



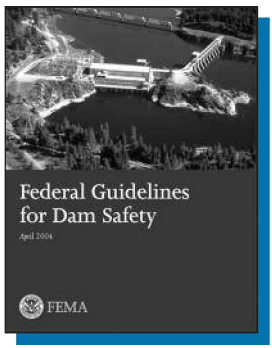
FEMA 65

These guidelines provide the basic framework for the earthquake design and evaluation of dams. The general philosophy and principles for each part of the framework are described in sufficient detail to achieve a reasonable degree of uniform application among the federal agencies involved in the planning, design, construction, operation, maintenance, and regulation of dams. This document includes general guidelines for specifying design earthquake loadings (for design or safety evaluation) and for performing seismic analyses for the design of new dams (for evaluating the safety of existing dams or modifying existing dams). The guidelines are presented in four parts: selection of design or safety evaluation for earthquakes; characterization of ground motions; seismic analyses of the dams and foundations; and evaluation of structural adequacy for earthquake loading.

The CD-ROM, FEMA 93CD, 2005, contains all of the Federal Guidelines for Dam Safety: FEMA 64; FEMA 65; FEMA 93; FEMA 94; FEMA 148; and FEMA 333.

Federal Guidelines for Dam Safety (FEMA 93)

These guidelines encourage strict safety standards in the practices and procedures employed by federal agencies or required of dam owners regulated by the federal agencies. The guidelines provide the most complete and authoritative statement available of the desired management practices for promoting dam safety and the welfare of the public. The guidelines apply to federal practices for dams with a direct federal interest; the guidelines do not attempt to establish technical standards and are not intended to supplant or conflict with state or local government responsibilities for the safety of dams under their jurisdiction.

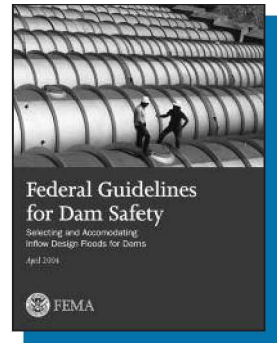


FEMA 93

The CD-ROM, FEMA 93CD, 2005, contains all of the Federal Guidelines for Dam Safety: FEMA 64; FEMA 65; FEMA 93; FEMA 94; FEMA 148; and FEMA 333.

Federal Guidelines for Dam Safety: Selecting and Accommodating Inflow Design Floods for Dams (FEMA 94)

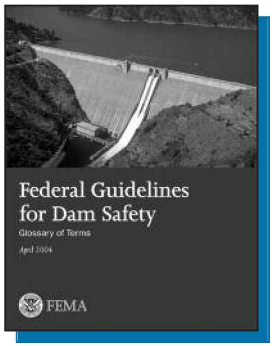
These guidelines provide thorough and consistent procedures for selecting and accommodating inflow design floods (IDFs), the flood flow above which the incremental increase in water surface elevation downstream due to the failure of a dam or other water retaining structure no longer presents an unacceptable additional downstream threat. These guidelines are not intended to provide a complete manual of all procedures for estimating IDFs; the selection of procedures is dependent upon available hydrologic data and individual watershed characteristics.



FEMA 94

The CD-ROM, FEMA 93CD, 2005, contains all of the Federal Guidelines for Dam Safety: FEMA 64; FEMA 65; FEMA 93; FEMA 94; FEMA 148; and FEMA 333.

Federal Guidelines for Dam Safety: Glossary of Terms (FEMA 148)



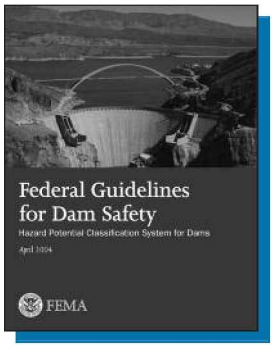
FEMA 148

This glossary provides a common terminology for dam safety for use within and among federal agencies. The terms are generic and applicable to all dams, regardless of size, owner, or location.

The CD-ROM, FEMA 93CD, 2005, contains all of the Federal Guidelines for Dam Safety: FEMA 64; FEMA 65; FEMA 93; FEMA 94; FEMA 148; and FEMA 333.

Available Online
Available on CD-ROM or DVD
Available in Video

Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams (FEMA 333)



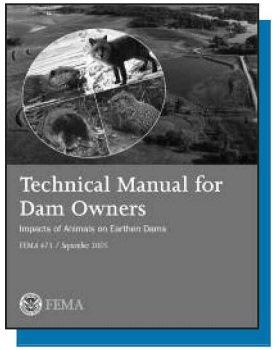
FEMA 333

Existing hazard potential classification systems are numerous and vary within and between the federal and state sectors. These guidelines set forth a hazard potential classification system for dams that is simple, clear, concise, and adaptable to any agency's current system. The intent is to provide straightforward definitions that can be readily understood by the public and applied uniformly by all federal and state dam safety agencies. The guidelines do not establish how the system will be used, such as prescribing specific design criteria or prioritizing inspections. Those responsibilities remain with the responsible regulatory authority.

The CD-ROM, FEMA 93CD, 2005, contains all of the Federal Guidelines for Dam Safety: FEMA 64; FEMA 65; FEMA 93; FEMA 94; FEMA 148; and FEMA 333.

Technical Manuals and Reports

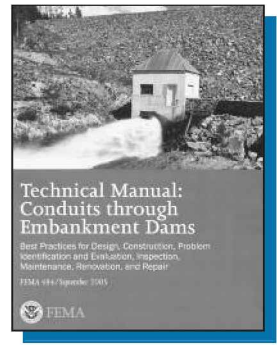
Technical Manual for Dam Owners: Impacts of Animals on Earthen Dams (FEMA 473)



FEMA 473

Safe dam operation includes comprehensive, state-of-practice guidance on timely inspection and observation of wildlife damages, accurate wildlife identification and mitigation, and appropriate dam design, repair, and preventive measures. This technical manual provides guidance to dam specialists, including dam owners, operators, inspectors, state dam officials, and consulting engineers, in the following areas: (1) the impacts wildlife can have on earthen dams; (2) habitat, range, description, and behavior of common nuisance wildlife to aid in the proper identification at the dam; (3) state-of-practice methods to prevent and mitigate adverse wildlife impacts on earthen dams; and (4) state-of-practice design guidance for repair and preventive design associated with nuisance wildlife intrusion.

Technical Manual: Conduits through Embankment Dams (FEMA 484)

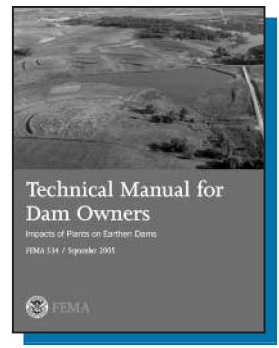


FEMA 484

Today, tens of thousands of conduits through embankment dams in the United States are aging and deteriorating. Many of these conduits were poorly constructed and are not frequently inspected, if at all. With each passing year, deteriorating conduits pose an increasingly greater risk for developing defects that can lead to embankment dam failure. This technical manual provides procedures and guidance for "best practices" for the design, construction, problem identification and evaluation, inspection, maintenance, renovation, and repair associated with conduits through embankment dams. The technical manual is intended for use by personnel familiar with embankment dams and conduits, such as designers, inspectors, construction oversight personnel, and dam safety engineers. The technical manual includes more than 280 illustrative figures, 34 case histories, and an extensive glossary.

The technical manual is also available in CD-ROM (FEMA 484CD) and DVD (FEMA 484DVD). The DVD format includes an extensive collection of "additional reading" references. PDF copies of these references are provided to further the user's understanding of topics related to conduits and embankment dams.

Technical Manual for Dam Owners: Impacts of Plants on Earthen Dams (FEMA 534)

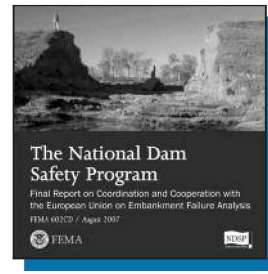


FEMA 534

Tree and woody vegetation penetrations of earthen dams and their appurtenances can cause serious structural deterioration and distress, resulting in the failure of earthen dams. This technical manual provides the dam owner, operator, inspector, dam safety regulator, engineer, and consultant with the fundamental understanding and technical knowledge associated with the potential detrimental impacts of tree and woody vegetation growth on the safety of earthen dams. The manual also provides the user with an understanding of the methods, procedures, and benefits of maintaining a growth of desirable ground cover of vegetation on the embankments of earthen dams.

Available Online
Available on CD-ROM or DVD
Available in Video

Final Report on Coordination and Cooperation with the European Union on Embankment Failure Analysis (FEMA 602)

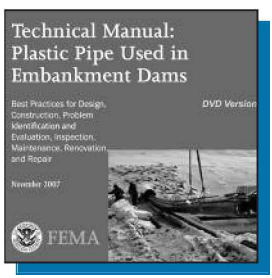


FEMA 602CD

There has been an emphasis in the European Union (EU) community on the investigation of extreme flood processes and the uncertainties related to these processes. Over a 3-year period, the EU and the U.S. dam safety community (1) coordinated their efforts and collected information needed to integrate data and knowledge with U.S. activities and interests related to embankment overtopping and failure analysis; (2) used the data to improve embankment failure analysis methods; and (3) disseminated the results to the U.S. dam safety community. This final report integrates EU and U.S. research findings and results related to earthen embankment overtopping failure over the 3-year period.

6

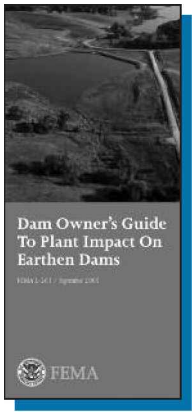
Technical Manual: Plastic Pipe Used in Embankment Dams (FEMA P-675)



FEMA P-675DVD

This technical manual provides the procedures and guidance for "best practices" concerning the design, construction, problem identification and evaluation, inspection, maintenance, renovation, and repair associated with plastic pipe used in embankment dams. The manual provides in-depth analyses of loading conditions, structural design, and hydraulic design of plastic pipe, and is intended for use by personnel familiar with embankment dams, drains, siphons, and conduits, such as designers, inspectors, construction oversight personnel, and dam safety engineers.

Dam Owner's Guide to Plant Impact on Earthen Dams (FEMA L-263)

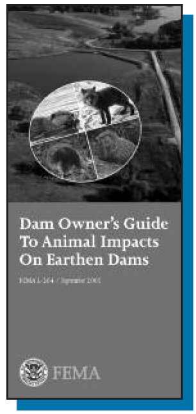


FEMA L-263

The dam owner is the first line of defense in the appropriate maintenance and safe operation of dams. This brochure describes the dangers presented by problem vegetation on earthen embankment dams and discusses how to identify problem vegetation. A quick quiz is included for dam owners to determine whether their dam may be at risk for problems related to inappropriate vegetation.

Dam Owner's Guide to Animal Impacts on Earthen Dams (FEMA L-264)

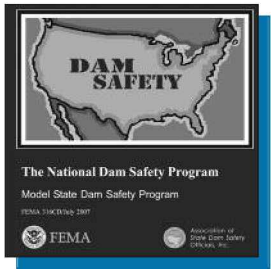
This brochure is designed to help the dam owner manage and reduce nuisance wildlife and wildlife damages at earthen dams. The brochure provides information on the types of nuisance wildlife damages, wildlife observation during routine inspections, wildlife identification, and basic damage repair.



FEMA L-264

Available Online
Available on CD-ROM or DVD
Available in Video

Model State Dam Safety Program (FEMA 316CD)

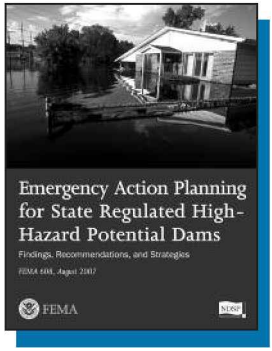


FEMA 316CD

There is great variance in the effectiveness of state dam safety programs. Although some of this variance may be appropriate as each state must address its dam safety needs and responsibilities in its own way, some state programs are not considered adequate. Many unsafe dams also have been identified and required remedial action has not been implemented. The Model State Dam Safety Program was first developed in 1987, updated in 1997, and updated again in 2006 to assist state officials in initiating or improving their state programs. The document outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to eliminate the risks created by unsafe dams.

Emergency Action Planning for State Regulated High-Hazard Potential Dams: Findings, Recommendations, and Strategies (FEMA 608)

Preventing loss of life from dam failure is the paramount concern of the National Dam Safety Program. This concern has intensified as a result of recent disasters that have focused attention on the state of the critical infrastructure in the United States and raised questions on the safety of dams nationwide. As part of a recent initiative to promote the implementation of Emergency Action Plans at all high-hazard potential dams across the United States, FEMA has asked all of the states to adopt the applicable recommendations contained in this paper.

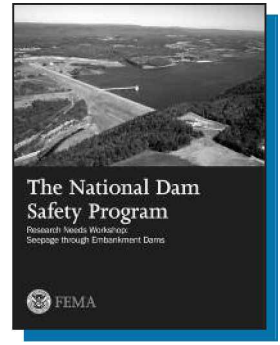


FEMA 608

National Dam Safety Program Research Needs Workshop Reports

Research conducted under FEMA's National Dam Safety Program addresses a cross-section of issues and needs, all in support of ultimately making dams in the United States safer. Since 1999, research funding under the National Dam Safety Program has been allocated to hold workshops in nine priority areas. The following National Dam Safety Program Research Needs Workshop reports are now available online and in CD-ROM format:

National Dam Safety Program Research Needs Workshop: Seepage through Embankment Dams (FEMA 535) 💻 ⊙



FEMA 535

This workshop report documents expert consideration of (1) potential seepage problems and solutions associated with penetrations through embankment dams, e.g., outlet works conduits; (2) filter design criteria and observed performance; (3) inspection of dams for detection of seepage problems, failure modes associated with seepage and internal erosion, and analysis of risks associated with seepage and internal erosion; (4) investigation of seepage problems and concerns at dams, including the use of geophysical techniques, and instrumentation and measurements for evaluation of seepage performance; (5) remediation of seepage problems through cutoff, reduction of flow, and collection and control of seepage, including the use of geosynthetics; and (6) impacts of the aging of seepage control and collection system components on seepage performance.

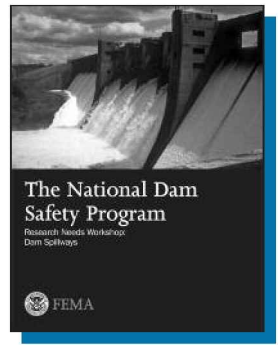
💻 Available Online

⊙ Available on CD-ROM or DVD

📼 Available in Video

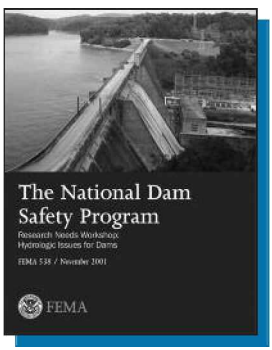
National Dam Safety Program Research Needs Workshop: Dam Spillways (FEMA 536)

This workshop report documents the state of practice concerning cost-effective techniques for the enlargement, modification, inspection, monitoring, and maintenance of dam service and emergency spillways. The report discusses dam safety research needs related to dam spillways, i.e., the short-term and long-term needs of the federal and non-federal dam safety community, and recommends a course of action to address those research needs.



FEMA 536

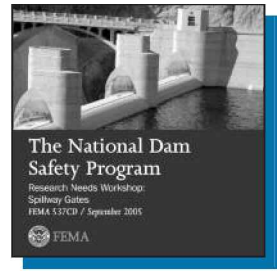
National Dam Safety Program Research Needs Workshop: Spillway Gates (FEMA 537)



FEMA 538

One of the outcomes of the Folsom tainter gate failure was the recognition of the need to revisit the issues related to gate performance and safety. This workshop report documents lessons learned from the Folsom tainter gate failure and applies those lessons across the broad spectrum of spillway gates. The report provides recommendations for future action and serves as a reference for regulatory agencies as they refine their requirements in this area.

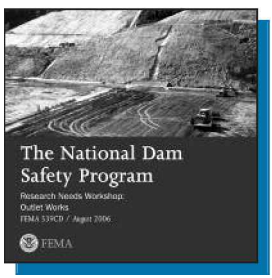
National Dam Safety Program Research Needs Workshop: Hydrologic Issues for Dams (FEMA 538)



FEMA 537CD

This workshop report documents expert findings in three areas: risk analysis, standards, and meteorological needs. Risk analysis focuses on items relating to uncertainty factors that influence reservoir inflow values and the computation of the Annual Exceedance Probability (AEP) of extreme floods. Standards issues include physical factors that influence the methodology for the computation of extreme floods, including the Probable Maximum Flood (PMF). Meteorological needs focus on rainfall analysis from both the standards base analysis and a risk-based analysis, including precipitation analysis, rainfall frequency analysis, and real-time storm analysis.

National Dam Safety Program Research Needs Workshop Report: Outlet Works (FEMA 539)

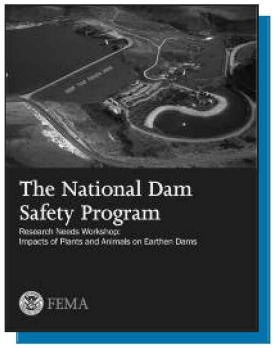


FEMA 539CD

This report addresses (1) outlet works failure modes, including failure by seepage and piping along the outlet works conduit; (2) conduit materials, selection criteria, and construction methods, including pipe material types and their advantages, disadvantages, and appropriate applications; (3) gates, valves, and controls, including types of gates and valves and their applications; (4) energy dissipaters, including stilling basins and energy dissipating valves; (5) rehabilitation of conduits, including in-place rehabilitation and replacement; and (6) outlet works inspection, including the determination of appropriate frequency; systems, methods, and techniques; and consideration of design criteria to accommodate inspection.

Available Online
Available on CD-ROM or DVD
Available in Video

National Dam Safety Program Research Needs Workshop: Impacts of Plants and Animals on Earthen Dams (FEMA 540)

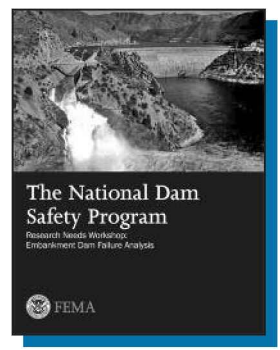


FEMA 540

Several areas for future development related to the impacts of plants and animals on earthen dams are documented in this report, including (1) the development of tools to educate dam owners and engineers on how to spot problems caused by plant and animal penetrations, how to prevent these problems from occurring, and how to mitigate or repair existing problems; (2) the analysis of tools and methods for repairing animal burrows on dams; and (3) collaboration with other groups, such as federal wildlife agencies that have research programs in place.

National Dam Safety Program Research Needs Workshop: Embankment Dam Failure Analysis (FEMA 541)

For this workshop, 35 national and international experts participated in discussions on research and new technology related to risk assessment, embankment dam failure, and flood routing. The experts identified 14 priority areas for research, including the updating, revision, and dissemination of the historic data set/database of dam failures; development of forensic guidelines and standards for dam safety expert use when reporting dam failures or dam incidents; creation of a forensic team that would be able to collect and disseminate valuable forensic data; identification of critical parameters for different types of failure modes; and basic physical research to model different dam parameters, such as soil properties and scaling effects, with the intent to verify the ability to model actual dam failure characteristics and extend dam failure knowledge using scale models.



FEMA 541

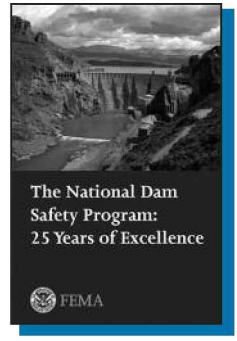
National Dam Safety Program Research Needs Workshop: Risk Assessment for Dams

This workshop report presents the detailed discussions of federal, state, and private sector experts on the three areas of risk assessment applications for dam safety: failure modes identification (qualitative approaches); portfolio risk assessment and index prioritization approaches (prioritization and portfolio approaches); and detailed quantitative approaches. The workshop participants recognized that stakeholders will have different information needs for their dam safety decisions. As a result, information that may play an essential role in a dam owner's decision-making process may not be needed by a regulator who oversees the dam owner's decision outcomes. Because the information needs of organizations vary widely, the workshop report acknowledges that it is not feasible for a single risk assessment approach to meet the needs of all organizations.

Brochures

The National Dam Safety Program: 25 Years of Excellence (FEMA L-262)

FEMA has provided leadership of the National Dam Safety Program for over 25 years. This brochure provides the general public with an overview of FEMA's role as lead agency and the responsibilities of the federal agencies that own, regulate, operate, and maintain dams. The brochure also describes the benefits of dams, including irrigation, electric power generation, flood control, and water storage.

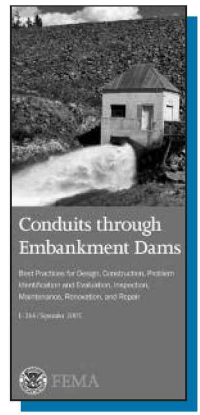


FEMA L-262

Available Online
Available on CD-ROM or DVD
Available in Video

Conduits through Embankment Dams: Best Practices for Design, Construction, Identification and Evaluation, Inspection, Maintenance, Renovation, and Repair (FEMA L-266)

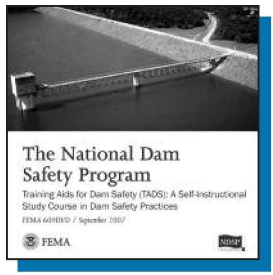
This brochure provides a summary of the information presented in *FEMA 484, Technical Manual: Conduits through Embankment Dams*, including the effects of conduits on embankment dams, internal erosion and backward piping erosion, the factors that can lead to embankment dam failure, and best practices for conduits through embankment dams.



FEMA L-266

Training Aids, Videos, and Software

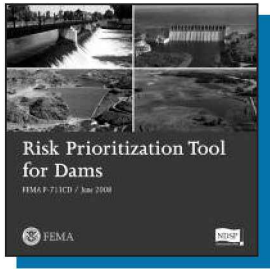
Training Aids for Dam Safety (TADS): A Self-Instructional Study Course in Dam Safety Practices (FEMA 609DVD) ⊙



FEMA 609DVD

The TADS program, one of the most successful training initiatives of the National Dam Safety Program, is a self-contained, self-paced training course consisting of 21 modules (workbooks and videos) for engineers, technicians, dam owners, water resource managers, public officials, and the public. In this 6-DVD set, the 21 TADS modules are organized into 3 components. The Dam Safety Inspection component includes 10 modules designed for engineers with little or no inspection experience and for technicians with some familiarity with dams. The Dam Safety Awareness, Organization, and Implementation component includes five modules designed primarily for dam owners and operators, including a module on how to develop and implement an Emergency Action Plan Users of the modules in the Data Review, Investigation, Analysis and Remedial Actions for Dam Safety component include dam safety program managers, dam owners and operators, and experienced engineers.

Risk Prioritization Tool for Dams (FEMA P-713) 💻 ⊙



FEMA P-713CD

The Risk Prioritization Tool for Dams is a simple, flexible, easy to implement decision-making tool which allows users to identify and prioritize dams within a large inventory. It provides an enhanced understanding of key contributors to risk at each dam and a systematic, unbiased, and logical framework for prioritizing and committing often limited resources. The tool, which is applicable to any type or number of dams, also provides an effective way to communicate dam safety risk to decision-makers and a consistent national methodology for regulators to evaluate dam safety. The Risk Prioritization Tool for Dams consists of two Microsoft Excel spreadsheets and a user's manual.

💻 Available Online

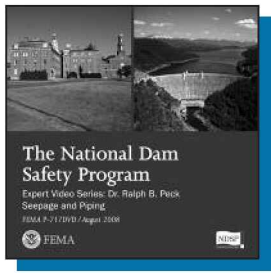
⊙ Available on CD-ROM or DVD

📼 Available in Video

Expert Video Series (FEMA P-717DVD through FEMA P-722DVD) ⊙

The Expert Video Series was developed for the National Dam Safety Program by the Interagency Committee on Dam Safety and the Department of the Interior, Bureau of Reclamation. The six videos present the following experts and topics:

- Dr. Ralph B. Peck: Seepage and Piping (FEMA P-717DVD)
- Dr. Don U. Deere: Dam Foundations (FEMA P-718DVD)
- Dr. John Lowe, III: Filters and Sinkholes and Rapid Drawdown Stability (FEMA P-719DVD)
- Dr. James K. Mitchell: Ground Improvement for Dam Safety (FEMA P-720DVD)
- Dr. I.M. Idriss: Behavior of Embankment Dams During Earthquakes (FEMA P-721DVD)
- Dr. Danny L. Fread: Dam Breach and Flood Wave Modeling (FEMA P-722DVD)



FEMA P-717DVD

Emergency Action Planning ⊙ 📼

This videotape presents the discussion of federal and state dam safety experts on the various aspects of emergency action planning for dams, including the components of an Emergency Action Plan (EAP) and how to assess whether a dam requires an EAP. An audiotape of the expert discussions is available in CD-ROM format.

Dam Seepage Monitoring System, Version 2 💻

The Dam Seepage Monitoring System is an interactive tool designed to help owners and operators store instrument data on their personal computers and plot the data for evaluation, thereby improving the safety of their dams. Version 2 of the Dam Seepage Monitoring System software, which is available at no cost to state dam safety officials and dam owners and operators, offers improved data entry, plotting, reporting, and installation features. The new desktop version 2.0 can be downloaded from the Association of State Dam Safety Officials web site at **www.damsafety.org.**

Resource List

Publications

FEMA 64, Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners. Interagency Committee on Dam Safety, 1998. Reprinted by the Federal Emergency Management Agency. Washington, D.C., 2004.

FEMA 65, Federal Guidelines for Dam Safety: Earthquake Analyses and Design of Dams. Interagency Committee on Dam Safety, 1985. Revised by the Interagency Committee on Dam Safety and reprinted by the Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA 93, Federal Guidelines for Dam Safety.
Interagency Committee on Dam Safety, 1979. Reprinted by the Federal Emergency Management Agency. Washington, D.C., 2004.

FEMA 94, Federal Guidelines for Dam Safety: Selecting and Accommodating Inflow Design Floods for Dams. Interagency Committee on Dam Safety, 1998. Reprinted by the Federal Emergency Management Agency. Washington, D.C., 2004.

FEMA 148, Federal Guidelines for Dam Safety: Glossary of Terms.
Interagency Committee on Dam Safety, 2003. Reprinted by the Federal Emergency Management Agency. Washington, D.C., 2004.

FEMA L-262, The National Dam Safety Program: 25 Years of Excellence. BRI Consulting Group. Federal Emergency Management Agency. Washington, D.C., 2004.

FEMA L-263, Dam Owner's Guide to Impacts of Plants on Earthen Dams. Dan Marks, P.E., Bruce Tschantz, P.E. Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA L-264, Dam Owner's Guide to Impacts of Animals on Earthen Dams. URS Corporation. Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA L-266, Conduits through Embankment Dams: Best Practices for Design, Construction, Identification and Evaluation, Inspection, Maintenance, Renovation, and Repair. Chuck Cooper, P.E., et al. Department of the Interior, Bureau of Reclamation. Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA 316CD, Model State Dam Safety Program. Association of State Dam Safety Officials. Federal Emergency Management Agency. Washington, D.C., 2007.

FEMA 333, Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams. Interagency Committee on Dam Safety, 1998. Reprinted by the Federal Emergency Management Agency. Washington, D.C., 2004.

FEMA 473, Technical Manual for Dam Owners: Impacts of Animals on Earthen Dams. URS Corporation. Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA 484, Technical Manual for Dam Owners: Conduits through Embankment Dams. Chuck Cooper, P.E., et al. Department of the Interior, Bureau of Reclamation. Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA 534, Technical Manual for Dam Owners: Impacts of Plants on Earthen Dams. Dan Marks, P.E., Bruce Tschantz. P.E., Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA 535, National Dam Safety Program Research Needs Workshop: Seepage through Embankment Dams. Association of State Dam Safety Officials and URS Greiner Woodward Clyde, October 17-19, 2000, Denver, Colorado. Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA 536, National Dam Safety Program Research Needs Workshop: Dam Spillways. Department of the Interior, Bureau of Reclamation, August 26-27, 2003, Denver, Colorado. Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA 537, National Dam Safety Program Research Needs Workshop: Spillway Gates. Association of State Dam Safety Officials and the Electric Power Research Institute, January 5-6, 2000, Palo Alto, California. Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA 538, National Dam Safety Program Research Needs Workshop: Hydrologic Issues for Dams. U.S. Army Corps of Engineers, Hydrologic Engineering Center, November 2001, Davis, California. Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA 539, National Dam Safety Program Research Needs Workshop Report: Outlet Works. URS Corporation, May 25-27, 2004, Denver, Colorado. Federal Emergency Management Agency. Washington, D.C., 2006.

FEMA 540, National Dam Safety Program Research Needs Workshop: Impacts of Plants and Animals on Earthen Dams. Association of State Dam Safety Officials, November 30-December 2, 1999, Knoxville, Tennessee. Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA 541, National Dam Safety Program Research Needs Workshop: Embankment Dam Failure Analysis. U.S. Department of Agriculture, Agricultural Research Service, June 26-28, 2001, Oklahoma City, Oklahoma. Federal Emergency Management Agency. Washington, D.C., 2005.

FEMA 602, Final Report on Coordination and Cooperation with the European Union on Embankment Failure Analysis. U.S. Department of Agriculture, Agricultural Research Service. Federal Emergency Management Agency. Washington, D.C., 2007.

FEMA 608, Emergency Action Planning for State Regnlated High-Hazard Potential Dams: Findings, Recommendations, and Strategies. Federal Emergency Management Agency. Washington, D.C., 2007.

FEMA P-675, Technical Manual: Plastic Pipe Used in Embankment Dams. Department of the Interior, Bureau of Reclamation; U.S. Department of Agriculture, Natural Resources Conservation Service; U.S. Army Corps of Engineers; Mine Safety and Health Administration; and Association of State Dam Safety Officials. Federal Emergency Management Agency. Washington, D.C., 2008.

National Dam Safety Program Research Needs Workshop: Risk Assessment for Dams. Association of State Dam Safety Officials and Utah State University, March 7-9, 2000, Logan, Utah. Federal Emergency Management Agency. Washington, D.C., 2005.

Training Aids, Videos, and Software

FEMA 609DVD, Training Aids for Dam Safety (TADS): A Self-Instructional Study Course in Dam Safety Practices. Interagency Committee on Dam Safety and the Department of the Interior, Bureau of Reclamation. Federal Emergency Management Agency. Washington, D.C., 2008.

FEMA P-713, Risk Prioritization Tool for Dams. URS Corporation. Federal Emergency Management Agency. Washington, D.C., 2008.

FEMA P-717DVD, Expert Video Series: Dr. Ralph B. Peck, Seepage and Piping. Interagency Committee on Dam Safety and the Department of the Interior, Bureau of Reclamation. Federal Emergency Management Agency. Washington, D.C., 2008.

FEMA P-718DVD, Expert Video Series: Dr. Don U. Deere, Dam Foundations. Interagency Committee on Dam Safety and the Department of the Interior, Bureau of Reclamation. Federal Emergency Management Agency. Washington, D.C., 2008.

FEMA P-719DVD, Expert Video Series: Dr. John Lowe, III: Filters and Sinkholes and Rapid Drawdown Stability. Interagency Committee on Dam Safety and the Department of the Interior, Bureau of Reclamation. Federal Emergency Management Agency. Washington, D.C., 2008.

FEMA P-720DVD, Expert Video Series: Dr. James K. Mitchell: Ground Improvement for Dam Safety. Interagency Committee on Dam Safety and the Department of the Interior, Bureau of Reclamation. Federal Emergency Management Agency. Washington, D.C., 2008.

FEMA P-721DVD, Expert Video Series: Dr. I.M. Idriss: Behavior of Embankment Dams During Earthquakes. Interagency Committee on Dam Safety and the Department of the Interior, Bureau of Reclamation. Federal Emergency Management Agency. Washington, D.C., 2008.

FEMA P-722DVD, Expert Video Series: Dr. Danny L. Fread: Dam Breach and Flood Wave Modeling. Interagency Committee on Dam Safety and the Department of the Interior, Bureau of Reclamation. Federal Emergency Management Agency. Washington, D.C., 2008.

Emergency Action Planning. Federal Emergency Management Agency. Washington, D.C., 1999.

Dam Seepage Monitoring System, Version 2. URS Corporation. Federal Emergency Management Agency. Washington, D.C., 2005.

Please visit
http://www.fema.gov/plan/prevent/damfailure/publications.shtm
to view or download publications.

Ordering Information

To order publications from this catalog, please call 1-800-480-2520 or fax 301-362-5335.