



# Guidelines for State Dam Safety Office Implementation of a Dam Security Program



## Introduction

The Nation's infrastructure is divided into 16 critical infrastructure sectors, which constitute the basic building blocks for national coordination efforts. The fundamental responsibility of coordinating and facilitating prioritization and protection efforts for each critical infrastructure sector has been assigned to a corresponding Sector-Specific Agency (SSA) within the Federal Government. The Office of Infrastructure Protection (IP) within the National Protection and Programs Directorate in the U.S. Department of Homeland Security (DHS) has been designated as the SSA for the Dams Sector. At the national level, coordination of dam security issues is conducted through a Government Coordinating Council (GCC) comprised of representatives from across various levels of government, including federal owners and operators, and state and federal regulators of sector assets. The GCC coordinates with their private sector counterpart, the Sector Coordinating Council (SCC), which is an organized, self-run, and self-governed organization that consists of members from the private sector. The Dams GCC and SCC provide a forum in which government and private sector partners can engage in a broad spectrum of activities to support and coordinate critical infrastructure protection programs and activities.

The National Inventory of Dams (NID) currently lists over 84,000 dams, most of which are regulated by state dam safety agencies. A number of these state-regulated dams are high-consequence structures that could potentially cause sudden downstream flooding with very severe casualties and catastrophic economic impacts if failure were to occur. The consequences of a deliberate attack on a dam could be wide-ranging and depend heavily on a number of variables, including: the type of dam, its function, what lies downstream, the nature of the failure, and the state of reservoirs above and below the dam. Even if a given attack is not immediately successful in inducing catastrophic dam failure, the resulting partial damage would limit the use of the project with significant regional consequences. It is important to protect dams because they constitute a vital component of the Nation's infrastructure, continuously providing a wide range of economic, environmental, and social benefits.

## Purpose

Dam security is the degree of protection for a dam against damage or loss caused by criminal or terrorist acts. Currently, many states have no clear authority in their statutes, or the resources, to regulate dam security. However, since the tragic events of September 11, 2001, many state dam safety agencies have begun to play an important role in the security of this critical infrastructure sector. Individual states have varying responsibilities and inventories of dams; therefore, each state will have varying degrees of participation in protecting their critical infrastructure from security threats. The purpose of this document is to make dam safety officials aware of potential opportunities to assist owners in improving the security of their dams.

The following actions can be utilized by state dam safety officials in implementing a dam security program depending on their authority, inventory of dams, overall responsibilities, priorities and resources:

1. Develop Awareness of Dam Security Issues and Responsibilities	1.1 Stay Informed and Develop a Basic Understanding of Security Issues
	1.2 Encourage Information Sharing and Outreach
2. Collaborate with State, Federal and National Organizations with Dam Security Responsibilities	2.1 Encourage State and Local Coordination and Collaboration
	2.2 Encourage Federal and National Coordination and Collaboration
3. Identify, Prioritize, and Evaluate Security Risks on State-Regulated Dams	3.1 Identify High-Priority State-Regulated Dams
	3.2 Conduct Risk Assessments for High-Priority State-Regulated Dams
	3.3 Support and Coordinate Development of Security Plans
	3.4 Monitor Status and Progress
4. Conduct Security Exercises and Participate in Related Activities	4.1 Conduct Security Exercises for High-Priority State-Regulated Dams
	4.2 Participate in Related Exercise Activities Relevant to Dam Security

## **1. Develop Awareness of Dam Security Issues and Responsibilities**

### **1.1 Stay Informed and Develop a Basic Understanding of Security Issues**

**Conduct Periodic Security Briefings and Provide Security Training to Dam Safety Personnel** - Focus on current dam security developments, Dams Sector activities and collaborative efforts, input from dam owners, and other potential tools or resources. A multitude of helpful references and training opportunities regarding dam security can be obtained through many sources, including the U.S. Department of Homeland Security (DHS) National Protection and Programs Directorate, Office of Infrastructure Protection; the Federal Emergency Management Agency; the Association of State Dam Safety Officials (ASDSO); and other federal and state agencies.

**Access the ASDSO's Security, Protection and Risk Mitigation for Critical Infrastructure Dams Website** - This website provides owners/operators, State dam safety officials, and other sector stakeholders with a variety of helpful information, resources and reference material regarding security, protection and crisis management issues focused on improving understanding of dam-related security and protection concepts. A link to the website is provided in the References and Resources listed in Appendix A.

**Access and Monitor the Homeland Security Information Network - Critical Sector (HSIN-CS) Dams Portal** - The HSIN-CS Dams Portal provides members with access to a variety of helpful references and guides regarding dam security, protection, and crisis management-related information, receipt of special notifications regarding dam safety and security incidents, events, training opportunities, etc. Owners/operators, State dam safety officials, and other sector stakeholders greatly benefit from access to this resource. To become a member of the HSIN-CS Dams Portal, contact the Dams Sector-Specific Agency (SSA) at [damsportal@hq.dhs.gov](mailto:damsportal@hq.dhs.gov). State dam safety officials must provide information to DHS personnel to be used for the purpose of processing requests for access to the HSIN-CS Dams Portal.

**Access the Dams Sector Analysis Tool (DSAT)** - DSAT is a Web-based platform jointly developed by the DHS National Protection and Programs Directorate, Office of Infrastructure Protection, and the U.S. Army Corps of Engineers (USACE), Headquarters, Office of Homeland Security. DSAT provides Dams Sector partners with secure access to a series of modules and applications covering a wide range of analytical capabilities. DSAT contains a powerful Web-based viewer with user-specific access that supports geospatial mapping, visualization, and analytical functions. In addition, the DSAT Viewer provides access to pre-processing capabilities to support automated dam-break flood simulations. The various analysis tools and data collection mechanisms within DSAT support the screening, prioritization, characterization, and analysis of critical assets. To gain access to DSAT, contact the Dams SSA at [dams@hq.dhs.gov](mailto:dams@hq.dhs.gov).

**Develop a Consolidated Reference Library of Dam Security Documents** - Examples of helpful documents include the following:

- Inventory of dams requiring elevated security scrutiny with contact names, telephone numbers, and e-mail addresses
- Consequence-Based Top Screen (CTS) data summaries
- Security-related correspondence to select dam owners
- Inundation maps (MapPoint & Google Earth overlays, or shapefiles to be viewed with the Dams Sector Analysis Tool (DSAT) Viewer)
- Meeting notes for the various state and federal coordination meetings/events
- Strategic documents and templates produced by DHS and/or other agencies related to dam security
- Records of HSIN-CS Dams portal requests from dam owners
- Records of suspicious activity reports posted on the HSIN-CS portal
- Logs for on-site security assessment visits, special security incidents, etc.
- Tools, brochures, fact sheets, general references, guides, handbooks, copies of monthly open source digest materials

## 1.2 Encourage Information Sharing and Outreach

**Enhance Dam Owner/Operator and First Responder Awareness of Dam Security Issues** - Owners, operators, and employees can be trained to observe, assess, and report potential asset vulnerabilities and suspicious incidents. Emergency response and law enforcement agencies will also benefit from increased awareness of Dams Sector assets in their jurisdictions. Provide basic verbal advice to dam owners directing them to useful reference materials or available tools including security related guidance documents posted on the State Dam Safety Program's website.

**Encourage Reporting of Suspicious Activities** - The reporting of suspicious activity at and around dams is a responsibility of everyone. To assist in the reporting of suspicious activities, DHS has prepared a "Dams Sector Suspicious Activity Reporting Poster/Flyer" which contains information on what to look for and how to report any such activity. In addition, a Dams Sector Suspicious Activity Reporting (SAR) Tool was developed to provide owners and operators with a mechanism to report and retrieve information pertaining to suspicious activities. The Dams SAR Tool, available via the HSIN-CS Dams Portal, is not intended to replace existing agency or organization reporting mechanisms, but rather enhance them by providing a broader, horizontal approach to reporting suspicious activities. The SAR tool offers users the opportunity to better understand the implications of incidents that occur throughout the Nation by examining reports from a broad range of sector stakeholders and subsequently determine any need to implement protective measures.

## **2. Collaborate with State, Federal and National Organizations with Dam Security Responsibilities**

### **2.1 Encourage State and Local Coordination and Collaboration**

**Coordinate and Collaborate with State and Local Agencies** - Meet with personnel from state and local emergency management agencies and state offices of homeland security on an annual or more frequent basis to stay apprised of dam security related activities, formulate inter-agency strategies, and coordinate important follow-up activities. In particular, establish a working relationship with the relevant state and major urban fusion centers. The fusion centers serve as focal points within the state and local environments for the receipt, analysis, gathering, and sharing of threat-related information.

**Coordinate and Collaborate with Dam Owners** - Establish coordination and collaboration mechanism such as a State-level Dam Security Working Group consisting of State Dam Safety representatives and owners of critical dams to discuss current issues, challenges, and needs.

**Coordinate and Collaborate with State Agency Dam Owners** - Security at state-owned dams, such as State Parks and Fish and Game Agencies, offers a different set of challenges and the State Dam Safety representatives should meet with these different agencies to develop a State-owned dam security plan.

### **2.2 Encourage Federal and National Coordination and Collaboration**

**Participate in National Dam Security Meetings and Committees** - Participate in meetings such as the Dams GCC and the ASDSO Committee on Security and Risk Mitigation for Critical Infrastructure Dams. These venues provide a means for maintaining and fostering beneficial working relationships with individuals involved in dam security matters, effectively working with other members on GCC working group assignments, and staying apprised of the government sector's overall approach toward dam security.

**Support Federal Requests for Information Regarding Dam Security** - Participate in the annual Consequence-Based Top Screen (CTS) program coordinated by DHS. Compile and submit data pertaining to select dams and the downstream areas at risk from their potential failure. DHS requests this information to support the identification of those critical facilities within the Dams Sector whose failure or disruption could potentially cause the most significant impact among sector assets and individual portfolios.

**Meet and Collaborate with DHS Protective Security Advisors** - Coordinate with the State Office of Homeland Security to participate in site visits conducted by DHS Protective Security Advisors (PSAs), who are critical infrastructure and vulnerability assessment specialists deployed in 50 states and Puerto Rico. They coordinate vulnerability assessments and training, support incident management, and provide a vital communication channel between state and local officials, private sector owners and operators, and DHS. They also assist law

enforcement and state homeland security advisors with ongoing state and local critical infrastructure security efforts such as local exercises and planning initiatives.

### **3. Identify, Prioritize, and Evaluate Security Risks on State-Regulated Dams**

#### **3.1 Identify High-Priority State-Regulated Dams**

**Conduct Consequence-Based Prioritization of State-Regulated Dams** - The potential downstream impacts from a failure of a dam along with the function/purpose of a facility must be evaluated to determine which dams should be considered critical. This should include a review of available dam breach inundation mapping to estimate the population at risk (PAR) and critical facilities located downstream of the impacted area. The critical services provided by the facility including but not limited to such functions as water supply and power generation should also be considered. This prioritization can be conducted using the CTS screening and prioritization methodology available through DSAT. This methodology is based on characterizing potential consequences through a number of parameters that quantify impacts or effects associated with a worst reasonable case scenario. The CTS approach enables the systematic identification of high-priority dams that reach critical importance based on the potential consequences resulting from severe damage or disruption.

#### **3.2 Conduct Risk Assessments for High-Priority State-Regulated Dams**

**Complete Security Inspection** - A security inspection involves the evaluation of the current state and appropriateness of the on-site security system/procedures and what needs to be completed at a project or facility to address concerns regarding security. A complete security system must address deterrence, detection, delay, assessment, and response. This evaluation identifies whether any security enhancements are needed, and if so, specifically what those enhancements consist of. The security inspection must also address the state of maintenance and readiness of the existing security systems/procedures. A sample security inspection checklist that can be used as a tool to help evaluate overall security is included in Appendix B.

**Complete Vulnerability Assessments** - A vulnerability assessment is the product or process of identifying physical features or operational attributes that render an entity, asset, system, network, or geographic area susceptible or exposed to hazards. This type of an assessment ultimately leads to recommended changes to the physical security or operational procedures that will serve to decrease overall risk. State dam safety agencies should have procedures in place to complete vulnerability assessments or require completion of the assessments by the dam owners through the regulatory process.

**Complete Risk Assessments** - A comprehensive risk assessment methodology - Common Risk Model for Dams (CRM-D) - has been developed and implemented on DSAT. The CRM-D assists in quantifying vulnerabilities

based on standard security configuration attributes and pre-selected attack vectors. It is used as an objective self-assessment tool that supports the consistent identification of scenario-based vulnerabilities and associated conditional risk estimates. The methodology is based on the definition of defensive layers, used to systematically characterize the security posture of critical components within the facility. The corresponding vulnerability assessment is conducted based on pre-selected attack vectors, which effectively streamlines the security assessment process and the determination of conditional risk values. State dam safety agencies should have procedures in place to complete risk assessments or require completion of the assessments by the dam owners through the regulatory process.

### 3.3 Support and Coordinate Development of Security Plans

**Develop a State Dam Security Implementation Plan** - Coordinate with the State Office of Homeland Security to develop a work plan that outlines the processes, procedures, and inter-agency coordination mechanisms related to dam security. This will include asset identification, priorities and responses to security threats.

**Oversee the Development of Plans for Individual Dams** - Plans could include emergency action plans, security plans, recovery plans or continuity plans. Planning is an essential component of the preparedness cycle. Planning provides a methodical way to think through the entire lifecycle of a potential crisis, facilitates the rapid exchange of information, and may shorten the time required to gain control of an incident. Using a team or group approach to the planning process helps organizations define their perception of the role they will play during an operation. Security plans should include procedures which reflect increasing security measures and procedures during periods of heightened terrorist threat as determined by the DHS National Terrorism Advisory System (NTAS). These plans can be modeled using guidance from the *Dams Sector Protective Measures Handbook* which highlights the different NTAS levels and suggested protective measures. The Federal Energy Regulatory Commission (FERC) has also developed a Security Plan Template which may be used as a guide by dam owners to develop their respective plans. Additionally, the *Dams Sector Crisis Management Handbook* includes templates for developing emergency action plans, recovery plans, and continuity plans.

### 3.4 Monitor Status and Progress

**Oversee Implementation of Protective Measures on Dams** - State dam safety personnel should perform periodic site visits with the owners/operators of high-priority dams to confirm that the upgrades recommended in their security assessments and plans are implemented. State personnel may also communicate with owners/operators during changes in the NTAS levels to confirm appropriate increases in security measures.

**Monitor Effectiveness of Protective Measures on Dams** - After the measures are in place, the state dam safety personnel should monitor the effectiveness and condition of the measures and recommend modifications and technology advances to the measures.

**Track General Status/Progress of Dam Security for State-Regulated Dams** – Conduct periodic security inspections of high-priority dams to evaluate completed security enhancements and procedural changes. Develop and maintain a document management system for security-related documents. Submit consolidated data regarding security issues as part of the National Inventory of Dams data call.

## **4. Conduct Security Exercises and Participate in Related Activities**

### **4.1 Conduct Security Exercises for High-Priority State-Regulated Dams**

**Encourage a Periodic Security Exercise Program for High-Priority State-Regulated Dams** - Establish a program for periodic security exercises at high-priority dams in coordination with the relevant state and local agencies. Effective exercises are an essential element of the preparedness cycle. Exercises help to raise the general awareness of potential crisis situations, ensure that key staff members are familiar with the plans and understand their roles and expected actions. Exercises are available in two basic forms, discussion and functional-oriented, which can vary in complexity based on the prior exercise experience of the participants. There are several types of exercises including seminars, workshops, tabletops, games, drills, functional, and full scale.

**Take Advantage of Existing Exercise-Planning Tools** - DHS has developed a sector-specific resource entitled “Dam Sector Tabletop Exercise Toolbox” (DSTET) to assist in the development and implementation of security exercises. DSTET provides dam owners and operators with basic planning resources to address sector-specific threats, issues and concerns related to the protection of dams. DSTET allows exercise participants to address key issues through a series of facilitated discussions. The intent of the toolbox is to enhance effective information sharing and coordination between owners and operators, first responders, and relevant stakeholders during various threat and incident phases as detailed in the corresponding scenarios. The toolbox is compliant with the “Homeland Security Exercise and Evaluation Program (HSEEP),” which is a capabilities and performance-based exercise program that provides a standardized methodology and terminology. To gain access to DSTET, contact the Dams SSA at [dams@hq.dhs.gov](mailto:dams@hq.dhs.gov).

### **4.2 Participate in Related Exercise Activities Relevant to Dam Security**

**Participate in Federal, Cross-Sector, or Regional Exercises and Assessments** - Whenever possible, participate in exercises or assessments conducted by Federal dam owners. In addition, other critical infrastructure sectors (water, energy, maritime transportation, among others) exhibit important inter-dependencies with dams. Participation in their exercises may prove mutually beneficial. Finally, participation in regional critical infrastructure assessments such as those conducted through the Regional Resiliency Assessment Program

(RRAP) led by DHS. This interagency program focuses on identification of critical infrastructure dependencies, interdependencies, cascading effects, overall resilience characteristics, regional capabilities, and security gaps.

## **Appendix A: References/ Resources**

## **Handbooks**

**Dams Sector Crisis Management Handbook:** Provides an introduction to crisis management measures for dam owners. In addition, it provides information relating to emergency response and preparedness issues; includes recommendations for developing emergency action plans and site recovery plans.

**Dams Sector Protective Measures Handbook (FOUO):** Provides an introduction to protective measures for dam owners. It assists in selecting protective measures addressing the physical, cyber, and human elements; includes recommendations for developing site security plans.

**Dams Sector Security Awareness Handbook (FOUO):** Assists in identifying security concerns, coordinating proper response, and establishing effective partnerships with local law enforcement and first responder communities.

## **Guides**

**Dams Sector Active and Passive Vehicle Barriers Guide:** Assists dam owners and operators in understanding the need for vehicle barriers as part of an overall security plan and familiarizes security personnel with the various types of active and passive vehicle barriers.

**Dams Sector Consequence-Based Top Screen Methodology Guide:** The methodology is used to identify critical facilities within the Dams Sector (i.e., those high-consequence facilities whose failure or disruption could be potentially associated with the highest possible impact among Dams Sector assets). The guide provides information pertaining to the overall implementation process, description of the parameters used within the methodology, and the prioritization scheme.

**Dams Sector Personnel Screening Guide for Owners and Operators:** Provides information that assists in developing and implementing personnel screening protocols.

**Dams Sector Roadmap to Secure Control Systems:** Describes a plan and strategic vision for voluntarily improving the cybersecurity posture of control systems within the Dams Sector and highlights recommended strategies to address the sector's most urgent challenges, mitigation requirements, and long-term research and development needs regarding control system security.

**Dams Sector Security Awareness Guide for Levees:** Assists in identifying security concerns, coordinating proper response, and establishing effective partnerships with local law enforcement and first responder communities.

**Dams Sector Waterside Barriers Guide:** Developed to assist dam owners and operators in understanding the possible need for waterside barriers as part of their overall security plan. It provides information on waterside barriers, including their use and maintenance.

**Estimating Economic Consequences for Dam Failure Scenarios:** Provides information describing the economic consequence estimation approaches most commonly used in the U.S., and discusses their advantages and limitations.

**Estimating Loss of Life for Dam Failure Scenarios:** Provides information describing the loss of life estimation approaches most commonly used in the U.S. and Canada, and discusses their advantages and limitations.

**Emergency Preparedness Guidelines for Levees:** Aims to assist public and private stakeholders that have responsibilities as owners or operators in managing levees, floodwalls, pumping stations, and any other components of flood risk management systems. The intent of the document is to provide guidance in preparing for, and responding to, potential natural and manmade incidents at levees.

### **Web-Based Training**

**IS-870 Dams Sector Crisis Management:** Addresses crisis management activities as an important component of an overall risk management program, and provides dam and levee stakeholders with recommendations to assist in the development of various plans focused on enhancing preparedness, protection, recovery, and resilience capabilities. The training course describes the purpose and basic elements of emergency action plans, recovery plans, and continuity plans; and addresses the basic elements of an effective exercise program.  
<http://training.fema.gov/EMIWeb/IS/IS870.asp>

**IS-871 Dams Sector Security Awareness (FOUO):** Provides information to enhance the ability to identify security concerns, coordinate proper response, and establish effective partnerships with local law enforcement and first responder communities. The training course describes common security vulnerabilities; potential indicators of threats; surveillance detection; and reporting of incidents and suspicious activities.  
<http://training.fema.gov/EMIWeb/IS/IS871.asp>

**IS-872 Dams Sector Protective Measures (FOUO):** Addresses protective measures related to physical, cyber, and human elements, and describes the importance of these measures as components of an overall risk management program. The training course describes the basic elements of the risk management model, and discusses the steps required to develop and implement an effective protective program. \*\*Note that this module is currently being updated to reflect the changes associated with the replacement of the old color-coded Homeland Security Advisory System (HSAS) with the new National Terrorism Advisory System (NTAS).  
<http://training.fema.gov/EMIWeb/IS/IS872.asp>

To access any of the Dams Sector resources listed above, contact the Dams SSA at [dams@hq.dhs.gov](mailto:dams@hq.dhs.gov).

## **Websites**

### **Association of State Dam Safety Officials**

<http://www.damsafety.org>

### **Federal Energy Regulatory Commission**

<https://www.ferc.gov/industries/hydropower/safety/guidelines/security.asp>

### **Homeland Security Exercise and Evaluation Program**

<http://hseep.dhs.gov/>

### **U.S. Department of Homeland Security – Critical Infrastructure**

<http://www.dhs.gov/criticalinfrastructure>

### **U.S. Department of Homeland Security – Active Shooter Preparedness**

[www.dhs.gov/active-shooter-preparedness](http://www.dhs.gov/active-shooter-preparedness)

### **U.S. Department of Homeland Security – State and Major Urban Fusion Centers**

[http://www.dhs.gov/files/programs/gc\\_1156877184684.shtm](http://www.dhs.gov/files/programs/gc_1156877184684.shtm)

## **Appendix B: Sample Security Inspection Checklist**

## SAMPLE SECURITY INSPECTION CHECKLIST

**Project Classification:** \_\_\_\_\_ **Project Name:** \_\_\_\_\_ **Dam:** \_\_\_\_\_

**Owner:** \_\_\_\_\_ **Security Group:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Inspector:** \_\_\_\_\_ **Accompanied by:** \_\_\_\_\_

**Field Observations:** (Provide additional details on back of sheet, if necessary)

**A. Studies and Assessments:**

1. Is there a Risk Assessment? **Date:** \_\_\_\_\_
2. Is there a Vulnerability Assessment? **Date:** \_\_\_\_\_
3. Is there a Security Assessment? **Date:** \_\_\_\_\_
4. Have critical assets and vulnerabilities been identified?
5. Have potential threats been identified in the assessments?
6. Have the impacts and consequences been assessed if critical assets are compromised?

**B. Critical Assets:**

7. Are spillway/gate controls secured against unauthorized access?
8. Are tower house doors/windows locked?
  - a.) Are sensors/alarms and cameras present?
  - b.) Can sensors/alarms be easily bypassed?
9. Are Critical Dam Features vulnerable?
  - a.) Are there Surveillance sensors, cameras and/or patrols present?
  - b.) Is Access to vulnerable features restricted?
10. Is there HAZMAT/fuel storage on site?
  - a.) Is access controlled and secured?
  - b.) Is the material easily portable?
11. Are water distribution outlets vulnerable?
12. Does the structural safety record of the dam make it vulnerable to an attack?

**C. Access Control**

13. Is the dam site fenced with gates/access points locked?

YES	NO	N/A





SENSITIVE

**Long Term:**

49. Has security been considered and incorporated into dam safety modifications and rehabilitation work?

50. Does Management have a funding program to address and improve security shortfalls?

**K. Current State of Security:**

51. Have different response levels been identified and implemented based on the potential threat conditions?

52. Are the measures on the day of inspection consistent with the current threat level?

53. Security Measures appear to be reasonable:

If "No", determine what follow up actions/improvements will be required.

YES	NO	N/A