

Reclamation Manual

Directives and Standards

Subject: Early Warning System

Purpose: To provide for the safety of the public and protect environmental resources that could be at risk from flooding associated with large operational releases or dam failure. This is accomplished by implementation and maintenance of an effective five component system designed to ensure timely recognition of a threatening event and provide for a reliable and timely warning and evacuation of the population at risk. These five system components are detection, decisionmaking, notification, warning, and evacuation.

Authority: Reclamation Project Act of 1902 and Supplementary Acts, Reclamation Safety of Dams Act of 1978 and Amendments of 1984, National Environmental Policy Act of 1969 (as amended), Department of the Interior – Departmental Manual Part 753 (or subsequent replacement documents), and Reclamation Manual FAC P01.

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1. **General.** An early warning system (EWS) provides for detection and decisionmaking concerning a threatening event and ensures notification of local authorities in sufficient time to allow them to warn and evacuate populations placed at risk by either large operational releases or dam failure. The ultimate measure of effectiveness of an EWS is that all the components (detection, decisionmaking, notification, warning, and evacuation) work in an integrated and effective manner to bring about a safe evacuation of the affected public. The operating office/entity of a dam is responsible for the daily operation, maintenance, and replacement (OM&R) activities associated with the detection, decisionmaking, and notification components of the EWS.
2. **Emergency Action Plans (EAP).** Area/Regional Offices will ensure that Emergency Action Plans (EAP) are updated/revised to reflect the effective implementation of an EWS.
3. **Detection/Decisionmaking/Notification Criteria.** Area/Regional Offices will:
 - A. **Detection.** Ensure that descriptive information on the types, locations, and the operational design of specific detection equipment installed or used as part of the EWS's implementation is contained in the Standing Operating Procedures (SOP) and/or EAP and coordinated with applicable local dam-specific Emergency Operations Plans (EOP). Ensure that detection equipment has adequate redundancy (backup) to provide a timely notification to responsible local emergency management officials for them to effectively warn and evacuate the population at risk.

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- B. **Decisionmaking.** Ensure that a summary of pertinent decisionmaking criteria (and assigned responsibilities), based on the design of the EWS is included as part of each dam's EAP and SOP and coordinated with applicable local dam-specific EOP's.
 - C. **Notification.** Ensure that communication facilities and equipment have adequate redundancy so timely passage of information to local emergency management officials occurs.
4. **Operation, Maintenance, Replacement, and Testing of EWS Equipment** (installed as part of the detection, decisionmaking, and notification components). Area/Regional Offices will:
- A. Review, revise, and maintain all applicable SOP's to provide current information on:
 - (1) Proper operating instructions and procedures of each item of equipment to be used in the detection, decisionmaking, and notification components of an EWS.
 - (2) Regularly scheduled (preventive) and emergency maintenance procedures and activities to ensure proper and reliable operating equipment.
 - (3) Information relative to the scheduled frequency of replacing key, critical components or items of equipment, as well as the location of spare parts.
 - (4) Regularly scheduled testing procedures to ensure the operational reliability of the equipment.
 - B. Ensure redundancy (backup) in critical EWS components/equipment and in personnel to adequately respond to operation and maintenance (O&M) problems, specifically:
 - (1) Replacement parts for critical equipment will be maintained at a location to ensure rapid delivery to the field site to minimize outage times.
 - (2) For each EWS installation, adequate personnel (either in-house or by contract) who are trained and experienced in the O&M of EWS related equipment will be made available for troubleshooting and servicing to minimize outage times.
 - C. Ensure adequate documentation is provided on the accomplishment of maintenance (including periodic inspection), replacement, and operational testing of all equipment associated with detection, decisionmaking, and notification components of an EWS.

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- D. Make available to operating offices and responsible operating entities a copy of Reclamation's Guidelines for Proper OM&R and Equipment Testing for Early Warning Systems located in the *Emergency Planning and Exercise Guidelines*, with the understanding that applicable portions can be helpful in developing site-specific O&M practices and procedures relative to EWS.
- E. Ensure the effectiveness for the life of the EWS, by entering into a memorandum of agreement with critical parties involved in the OM&R activities of an EWS that addresses the following:
 - (1) Jurisdiction of each party.
 - (2) Operational responsibility of each party.
 - (3) Maintenance responsibility of each party.
 - (4) System testing and exercising procedures.
 - (5) Updating of system procedures, plans, and agreements.
 - (6) EWS's financial responsibilities.
 - (7) Term of agreement.
 - (8) Remedy for noncompliance with agreement provisions.

5. **System Exercising/Training of Personnel.**

- A. Participation in Reclamation's Emergency Management Orientation Seminar or other equivalent training is a prerequisite for all Reclamation and responsible operating personnel involved in the emergency response operations of an EWS.
- B. As part of completion of the implementation of an EWS (and following required training of involved personnel), a minimum of one tabletop exercise, involving both Reclamation and local emergency management organizations, is required to ensure the operational effectiveness of an EWS.
- C. An annual orientation meeting is required and will include all EWS participants, including representatives from impacted downstream jurisdictions that are determined to be essential participants in an EWS. If orientation meetings are not held annually, appropriate justification is required.

6. **Downstream Warning and Evacuation.** Area/Regional Offices will:

- A. Ensure that a local dam-specific EOP, annex, or stand-alone warning and evacuation plan contains emergency response procedures that are properly linked to the corresponding notification procedures in Reclamation's EAP.

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- B. Verify that local jurisdictions who are essential participants in the EWS have the capability to reliably and effectively carry out the functions of the two downstream components of an EWS (downstream warning and evacuation) and that they are fully integrated with other components of the EWS (detection, decisionmaking, and notification). Their capability will be evaluated further through their participation in tabletop or functional exercise.
7. **Completion of EWS Implementation.** Prior to notification of completion of the implementation of an EWS, Reclamation will undertake the following actions:
- A. Ensure complete implementation of all EWS components.
 - B. Complete revisions to EAP's according to standards outlined in these directives. Necessary changes to the SOP will also be complete.
 - C. Verify existence of an adequate dam-specific EOP.
 - D. Document successful completion of an exercise of the EWS.
 - E. Complete a memorandum of agreement (signed and distributed) with all parties involved in an EWS.
 - F. Provide written notification from the Regional Director to the Director, Operations (Dam Safety Office) and to the Director, Program Analysis Office (Facilities and Operations Support) outlining important activities/steps accomplished in order to show the EWS to be fully implemented and operational.
8. **EWS Funding.**
- A. **Design/Installation Costs.** One of the following funding sources will normally be used to pay the EWS design and installation costs:
 - (1) **SOD Funded.** Design and installation costs are to be allocated between the Federal Government and authorized project beneficiaries based upon current SOD legislation.
 - (2) **Operation and Maintenance Funded.** Design and installation costs are to be expended in the year(s) that the funds are appropriated and allocated annually to project purposes the same as any other OM&R cost.

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- B. **OM&R Costs.** The Reclamation Safety of Dams Act does not authorize expending SOD funds for OM&R costs. The OM&R costs are to be included in the operating projects' budget and be allocated to project purposes based on current Reclamation OM&R policy and procedures and applicable repayment contracts. Project beneficiaries will share OM&R costs as allocated and are expected to pay 100 percent of their portion of the EWS OM&R costs.
- (1) Cost sharing of EWS OM&R costs by Reclamation may be considered when an EWS is determined to be the least cost SOD corrective action to the Government, and the project irrigators lack of financial capability to pay the EWS OM&R costs may compromise its effectiveness. Cost sharing will be considered to ensure a competent system but not to enhance its features beyond what is necessary. This policy permits Reclamation to enter into a cost-sharing agreement with the irrigation entity for EWS OM&R only if a finding shows that the entity does not have the financial capability to pay 100 percent of their share of the OM&R costs and that the lack of financial capability may jeopardize the future of the EWS. The irrigation entity must supply documentation as to why they could not pay all of their allocated OM&R costs considering all revenue sources and rate structures. A basis for negotiations must be prepared by the region and approved by the Commissioner's Office before negotiations begin. The basis for negotiations will be supported by an analysis of the entity's financial situation which may include an update of the entity's payment capacity (farm budget analysis). Irrigation entities will pay OM&R costs at least equivalent to 100 percent of their ability to pay, and every effort will be made to collect as much of their allocated OM&R costs as possible without jeopardizing the financial integrity of the entity. Reclamation will fund its agreed upon portion of the EWS OM&R costs from the associated operation and maintenance program specifically identified for EWS OM&R.
 - (2) When the EWS OM&R cost-sharing agreement expires, a determination will be made as to the irrigation entity's capability to pay their full allocated OM&R costs before entering into a new or extended agreement.
- C. **Cost Sharing With Other EWS Beneficiaries.** Integration of an EWS with other planned or existing systems or the use of the collected data by others will be accomplished, where possible. Cost sharing will be actively pursued with nonproject entities receiving a significant benefit from the EWS.