Reclamation Manual

Directives and Standards

Subject: Emergency Management

Purpose: To provide for the safety of the public and protect environmental resources from incidents at our facilities by (1) taking reasonable and prudent actions necessary to ensure timely notification to potentially affected jurisdictions of such incidents so that warning and evacuation of the public can be accomplished; and (2) defining program needs and requirements essential to maintain self-regulation by line managers, be responsive to public safety, and satisfy legal requirements during operations or emergency incidents at our facilities.

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.

Contact: Facilities & Operations Support, D-5500

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1. **Emergency Action Plans (EAP).** Area/Regional Offices will:

   A. Ensure that EAP's are developed and implemented at all significant and high hazard dams.

   B. Ensure that EAP's are reviewed annually and revised or updated in a timely manner. Reviews will include both the specific procedures contained in the EAP's as well as the names, telephone numbers, radio frequencies, and organizations contained in the Communications Directory.

   C. Ensure that EAP's contain complete descriptions of available communication capabilities and related notification procedures. Appropriate communication directories will also be included.

   D. Ensure that EAP's contain initiating conditions (including hydrologic and nonhydrologic events), emergency response levels, expected actions for each response level (operating personnel and Reclamation offices), and hazard specific appendices with procedures to follow.

E. Ensure that EAP's contain descriptions of potentially affected areas in the flood plain with inundation maps wherever appropriate, and tables showing travel times and other pertinent information that may be needed by local emergency management officials.

F. Additional guidance to assist in the preparation and revision of EAP's is contained in the following documents (or subsequent revisions to these documents):

(1) *Emergency Planning and Exercise Guidelines*, March 1995, U.S. Bureau of Reclamation. These replace the "Emergency Preparedness Plan" guidelines contained within the *Guide for Preparation of Standing Operating Procedures for Dams and Reservoirs*, January 1986, U.S. Bureau of Reclamation.

(2) *Federal Guidelines for Dam Safety*, *FEMA 93/October 1979*, Federal Emergency Management Agency (FEMA).

(3) *Emergency Action Planning Guidelines for Dam Owners*, 1996, (supersedes FEMA 64/February 1985), Federal Emergency Management Agency.

2. **Inundation Mapping.** Reclamation prepares dam failure inundation studies and maps for several purposes. The following directives will apply when the purpose is emergency action planning where the maps and information will be used in Reclamation's EAP's and local warning and evacuation plans. Guidelines for scientific and technical methods of developing the inundation study results can be found in technical literature from the National Weather Service and others. Conditions that warrant reviewing, revising, or developing new inundation studies and maps include: implementation of Safety of Dams corrective actions, implementation of early warning systems (EWS), revision or preparation of EAP's, requests from downstream jurisdictions for more inundation information for their warning and evacuation plans, or identification of significant deficiencies in current inundation studies or maps. When it becomes necessary to prepare or revise a study, the following criteria will apply:

A. Mapped flood boundaries representing the dam failure condition will reflect a failure assumed to occur with the water surface at the crest of the dam or at the maximum water surface elevation reached while routing the most recent probable maximum flood, whichever is less.

B. Mapped flood boundaries, representing a life-threatening operational release condition, will be prepared to indicate flooding that would result from spillways and/or other appurtenant structures operating at design capacity. Local conditions may warrant mapping boundaries for other levels of flooding smaller than the design capacity flood.

Mapping of operational release flood boundaries would generally only be done in reaches where dam-failure floods are mapped.

C. Inundation studies and associated descriptions of flooded areas will be terminated only when the point of adequate floodwater disposal is reached and the flood no longer poses a significant risk to life.

D. Mapping of flood boundaries will be completed for populated areas (vs. rural areas with very sparse or no homesites) within the lessor of (1) a dam-failure flood travel time of about 48-hours after the initial dam failure or (2) to the point of adequate floodwater disposal. Downstream jurisdictions beyond the point where mapping is discontinued would only be provided Reclamation's estimates of flood depths and flood travel times for use in their warning and evacuation plans.

E. Any maps prepared will be at a scale and quality that enables a person familiar with the area to clearly comprehend an aerial view of the extent of flooding. In most cases, U.S. Geological Surveys 7.5-minute topographical quadrangles are adequate to use as a base for the inundation maps.

F. A table will accompany the inundation maps providing information on river miles from the dam, travel times for arrival of the leading edge of the dam failure flood wave, travel times for arrival of the crest of the dam failure flood, and maximum flood depths and flows for the events mapped including any operational release conditions. This is a specific example of technical information that may need interpretation by Reclamation staff to make it usable by local jurisdictions.

G. The results of the inundation study are generally depicted on maps and associated tables. For various reasons, including the ability to convey the extent of flooding to people that are not adept at using maps or do not have access to maps, the inundation area will be described in generalized sentence form. This type of description is also valuable in preparing warning and evacuation messages issued by the downstream jurisdictions and the National Weather Service.

3. **Exercising/Personnel Training.** Area/Regional Offices will:

A. Ensure that all Reclamation and operating entity personnel who have assigned responsibilities during emergency operations at dams and other pertinent facilities acquire professional emergency management training. Recommended training includes:

(1) Exercise Design Course (FEMA sponsored, State conducted).
(2) Emergency Management Orientation Seminar (Reclamation).

(3) Integrated Emergency Management Course (FEMA).
(4) Exercise Evaluation Methodology (FEMA).
(5) Dam Operator's Training (Reclamation).
(6) Other similar and appropriate training.

B. Members of each exercise design team (one or more staff personnel assigned to coordinate the exercises) are required to attend one of the first two training sessions listed above or other equivalent training. Attendance at both courses is recommended. All dam operating personnel will attend Dam Operator's Training every 3 years. It is also recommended that, at some time, operating personnel attend an Emergency Management Orientation Seminar. Refresher training will be attended by appropriate personnel on an as-needed basis.

C. Develop and conduct an emergency exercise program to evaluate emergency response capabilities of those Reclamation employees that would be involved in the emergency operations at our dams or facilities. Guidance on developing and implementing an emergency exercise program may be found in Reclamation's *Emergency Planning and Exercise Guidelines*.

D. According to the Federal Emergency Management Agency's "Exercise Design Program," an emergency exercise program process includes five components or levels which include the orientation seminar, drill, tabletop exercise, functional exercise, and full-scale exercise. FEMA's definitions of those five levels of exercises have been revised to reflect Reclamation's needs and are as follows:

(1) **Orientation Seminar.** An activity designed to introduce, discuss, and update emergency planning documents; organization structure; or EWS component to familiarize key personnel with the emergency procedures and their responsibilities. This may be through a lecture, panel discussion, or general discussion and can include visual presentations. This will involve all personnel with a role in the plan, problem, or procedure. It will also include a review of past cases, if any, for lessons learned.

(2) **Drill.** An activity designed to evaluate a single emergency response function. This involves an actual field response such as making contacts to check the information included in the communication directory. A drill's effectiveness lies in the focus on a single or relatively limited portion of the overall response system in order to evaluate and improve that function.

(3) **Tabletop Exercise.** An informal activity involving discussions of actions to be taken based on described emergency situations. A tabletop exercise is done

without time constraints, which allows the participants to practice emergency situation problem solving, evaluate plans and procedures, and to resolve questions of coordination and assignment of responsibilities. A series of messages are issued to participants in the exercise, and they respond verbally to the simulated incident in a nonstressful atmosphere. This exercise will involve management, key agency staff, and personnel from outside organizations as appropriate.

(4) **Functional Exercise.** An activity in which participants respond in a coordinated manner to a timed, simulated incident that parallels a real operational event as closely as possible. This exercise is generally conducted in an emergency operations center or incident command post and messages are passed to the participants in written form, by telephone, radio, FAX, computer, or other method of communication. The functional exercise uses information such as emergency plans, maps, charts, and other information available in a real event and creates stress by increasing the frequency of messages, intensity of activity, and complexity of decisions and/or requirements for coordination. It does not involve actual mobilization of emergency response forces in the field. Participants will include management, key agency staff, and personnel from outside organizations as appropriate.

(5) **Full-Scale Exercise.** An activity in which emergency preparedness officials respond in a coordinated manner to a timed, simulated incident but includes the mobilization of field personnel and resources and the actual movement of emergency workers, equipment, and resources required to demonstrate coordination and response capability. This exercise is intended to evaluate the entire emergency organization or its major parts in an interactive manner over a substantial period of time. It mobilizes emergency officials in an emergency operations center plus the activation of one or more emergency functions outside of the center. Reclamation will not generally conduct this level of exercise, but will participate in exercises conducted by others when our facilities are involved.

E. Emergency exercises will be developed and conducted in an ascending order of complexity from the above list. Orientation seminars will be conducted prior to conducting any tabletop exercises. Likewise, one or more tabletop exercises, along with appropriate orientation seminars leading up to each tabletop exercise, will be conducted prior to conducting a functional exercise. Local jurisdictions or others may conduct full-scale exercises, which include implementation of field elements of a plan. This level of exercise will be considered as an optional emergency exercise activity where Reclamation would participate if others were to conduct the exercise.

F. Exercise type and frequency will be determined on the basis of site-specific conditions. As a minimum:

(1) Annually, each dam will have a communications drill to evaluate its effectiveness and ensure information is up to date in the Communications Directory associated with that EAP and/or Standing Operating Procedures (SOP).

(2) The EAP for each significant- and high-hazard dam will be subject to a tabletop exercise every 3 years. When possible, this exercise will coincide with the downstream jurisdiction's frequency of exercising their dam-specific Emergency Operations Plans (EOP).

(3) A functional exercise will be conducted at high-hazard dams every 6 years. When possible, it will coincide with the downstream jurisdiction's exercise of their dam-specific EOP's. Depending on its extent and involvement with affected parties as outlined in the EAP, an actual emergency event may satisfy this exercise requirement.

G. To attain the greatest economic efficiency, several dams may be covered by a single seminar, drill, or exercise where it is determined to be geographically and functionally feasible.

H. Key personnel from State and local emergency management agencies will be invited to participate in any training and exercise. Reclamation and/or the operating entity personnel will participate in exercises conducted by the downstream jurisdictions, or others, when our facilities are involved.

I. Each exercise conducted or participated in will be documented with identified strengths, deficiencies, and recommended corrective actions, including a planned course of action to implement and track the recommended actions. Guidance is provided in the *Emergency Planning and Exercise Guidelines* as to the content and format of such documentation.

4. **Downstream Warning and Evacuation.** Area/Regional Offices (or where appropriate, the Reclamation Service Center) will work with the dam operating entity to:

A. Maintain a redundant means to timely communicate (e.g., primary telephone with backup radio) with emergency management officials.

B. Provide inundation maps and other appropriate information and offer technical assistance, specifically staff support for interpretation of technical information, to local

emergency management officials for their development of or revisions to their dam-specific EOP's.

C. Coordinate annually with appropriate Federal, State, and/or local emergency management officials to:

(1) Support local efforts to attain and maintain the capability to effectively warn and evacuate persons placed at risk by operational releases or dam failure.

(2) Ensure that the local dam-specific EOP response procedures are properly linked to the corresponding notification procedures in Reclamation's EAP's.

(3) Encourage and participate in joint exercises involving Reclamation dams, when such occur.

(4) Document all coordination efforts with emergency management officials for future reference purposes.

(5) Ensure that responsible operating entities carry out these activities similar to other delegated O&M activities.

D. If appropriate, provide a copy of Reclamation's Local Warning and Evacuation Plan Prototype, which is in the *Emergency Planning and Exercise Guidelines*, to local emergency management officials to support their efforts in development of their dam-specific EOP's.

5. **Information Database.** The Commissioner's Office will be provided with an annual update of the coordination activities each Regional and Area office performs with all of the jurisdictions downstream from Reclamation dams. To minimize the reporting effort, this will be done to the extent possible using the Reclamation computer network. The information will be stored in the Dam Safety Information System located in Reclamation's Denver Office.