

CRS 600 Series: Warning and Response

The 600 series of activities within the Community Rating System (CRS) is focused on linkages between a community's emergency management mission and its voluntary CRS activities. These credited activities focus on the life safety aspect of a community's floodplain management program, particularly its emergency management flood warning programs, and can result in additional CRS discounts for your citizens. For more information:

http://www.youtube.com/watch?v=R_UiWz2Ogu8 = Link to 'YouTube' webinar 'CRS: Credits for Flood Warning.'

Catalyst of Change. Even though flood preparedness and response operations frequently rest within the purview of the community's (or county's) emergency management office, the emergency manager's role in advancing public safety, property protection, and disaster resiliency and sustainability through the National Flood Insurance Program and the CRS is sometimes overlooked by the community. The community CRS Coordinator typically coordinates with the county or community emergency management staff to document activities that are credited under the 600 Series. The daily emergency management mission of prevention, preparedness, response, recovery, and mitigation can successfully be integrated with the CRS. Activities 610, 620 and 630 evaluate the community emergency management program in regard to flood warning, levees and dams.

Background. Activities under the 600 Series encourage and promote the development and use of community-based flood detection systems, warning dissemination programs, coordinated flood response activities, and critical facility planning. These are the activities that help reduce the threat to life safety, health, and property damage. The emergency manager is the identified catalyst of this effort.

Three activities make up the 600 Series. Activity 610 (Flood Warning and Response) forms the building block of the series, because all communities must have these basic services. **Activity 620 (Levees)** and Activity 630 (Dams) are for more specific threats that are not present in every community, namely levees and dams. All three activities are organized in a similar fashion, with pertinent credit criteria, and require some actions for

- Advance notification of an impending flood (threat recognition);
- Warnings issued to the threatened population (warning);
- Steps taken to protect life and reduce losses (operations), and;
- Coordination with critical facilities (critical facilities planning).

All three activities have a public information prerequisite to educate residents and businesses concerning safety measures before, during, and after a flood. All three activities require the annual completion of a drill, a flood exercise, or documentation of an actual response to an emergency. The latter also requires the submittal of an after-action report or lessons-learned document, including any recommendations for changes to the adopted plan. A flood, levee failure, dam failure, or hurricane exercise qualifies as an exercise for all three activities.

Focus of this checklist. Activity 620 (Levees) credits locally coordinated inspection and maintenance of levees and identification of impending levee failure areas, combined with a flood warning response plan that recognizes the hazards of levee failure. The possible 235 points are spread among five elements, which are similar to the first four elements of Activity 610.

- Levee maintenance (**LM**) is focused on the proper maintenance of the levees (up to 95 points);
- Levee failure threat recognition system (**LFR**) looks at the system used to advise local emergency managers of a potential levee failure or overtopping (up to 30 points);
- Levee failure warning (**LFW**) credits the warning system for people on the landward side of the levee (up to 50 points);
- Levee failure response operations (**LFO**) credit is based on the plan of action to minimize the threat to life and property during the flood (up to 30 points), and;
- Levee failure critical facilities planning (**LCF**) considers the coordination with critical facility operators (up to 30 points).

Credit can be provided to accredited and non-accredited levees. Documentation of annual inspection and maintenance for LM credit is required, however, LM is not provided for accredited levees or levees owned and operated by a federal agency. The community must receive some credit in the four levee failure warning and response elements in order to receive any credit under Activity 620. For more details, refer to the 2013 *CRS Coordinator's Manual*.

In summation, for Activity 620 credit criteria is as follows:

- a. Credit is limited to levee systems that were designed and constructed as levee systems and are operated and maintained by a public agency;
- b. The community must submit a map showing the location of each levee and the areas that would be flooded if the levee were to fail or be overtopped;
- c. Annual inspections of the levee system must be conducted according to a written maintenance plan;
- d. The community must implement an outreach project to the residents and businesses in the area(s) that would be inundated if a levee were overtopped;
- e. There must be a levee flood warning and response plan that has been adopted by the community's governing body, and;
- f. There must be an annual exercise of the plan and a lessons-learned report (discussed on pages 620-4 and 620-5 of the CRS Coordinator's Manual).

If you have any questions concerning the following checklist, please contact Al Goodman at Al@awgconsulting.comcastbiz.net or by phone at 769-251-5356.

The community reports with its documentation checklist:

- There is one levee affecting the community and it is operated and maintained by a public agency. Documentation submitted: 1) A map which depicts the location of the levee and the areas that would be flooded if the levee were to be overtopped; 2) A list of the addresses of all 56 properties with insurable buildings that could be affected by a failure or by the overtopping of the levee; 3) A list of the critical facilities that would be flooded or otherwise affected by a failure or by the overtopping of the levee; 4) The levee maintenance plan and emergency action plan; 5) The community annually implements one or more outreach projects to the residents and businesses in the area(s) expected to be inundated by a flood that overtops the levee; 6) The community conducted a tabletop exercise within the past year which exercised its levee failure warning and response plan. The After Action Report is attached; 7) A Completed and signed CC-620EHP.
- The total number of buildings in the community affected by possible levee failure as shown on the affected area map is 56. **bLF= 56.**
- The community has a levee maintenance program and an emergency action plan thereby qualifying for 95 points. **LM = 95, bLM = 56.**
- The levee failure threat recognition system which monitors river flood conditions and the condition of the levee itself is scored as 15 points of credit for monitoring upstream flood conditions and for monitoring flood conditions along the levee itself. **LFR = 15, bLFR = 56.**
- The community’s levee failure warning procedures uses scripted messages, an outdoor voice system and siren system, the EAS using pre-scripted messages and a telephonic warning and notification system is used. This results in 35 points of credit. **LFW = 35, bLFW = 56.**
- The levee failure response plan contains scenarios for levee failure and describes the tasks to be taken and identifies the responsible staff. This results in 25 points of credit. **LFO = 25, bLFO = 56.**
- There are six critical facilities in the mapped affected area; the plan lists the names and phone numbers of only three of these facilities. One facility requires special warning and notification. None had their own levee failure response plan. **LCF = 7.5 (partial credit).**

$$LM = 95 \quad rLM = \frac{bLM}{bLF} = \frac{56}{56} = 1.0$$

$$LFR = 15 \quad rLFR = \frac{bLFR}{bLF} = \frac{56}{56} = 1.0$$

$$LFW = 35 \quad rLFW = \frac{bLFW}{bLF} = \frac{56}{56} = 1.0$$

$$LFO = 25 \quad rLFO = \frac{bLFO}{bLF} = \frac{56}{56} = 1.0$$

$$LCF1 = 7.5 \quad LCF2 = 0$$

$$c620 = (LM \times rLM) + (LFR \times rLFR) + (LFW \times rLFW) + (LFO \times rLFO) + LCF1 + LCF2$$

$$c620 = (95 \times 1.0) + (15 \times 1.0) + (35 \times 1.0) + (25 \times 1.0) + 7.5 + 0 = 177.5 = \mathbf{178} \text{ (rounded)}$$

Activity 620 (Levees) Documentation Checklist

	Emergency Manager	CRS Coordinator
Name		
Title		
Address		
Phone		
E-mail		

Form Completed By: _____ Date: _____

Comments:

Please provide the five totals requested below. The credit points for the four levee failure warning and response elements (LFR, LFW, LFO and LFO) are adjusted based on the number of buildings affected by the element. Determining these adjustments requires identifying the area affected and then counting the buildings within that area. Identifying the affected area is described in Section 621.c, Map of Affected Area (CRS Coordinator’s Manual).

- (1) Total number of buildings in the community affected by levee failure as shown on the affected area map. _____
- (2) Number of buildings in the area affected by a flood resulting from a failure of the levee being maintained. _____
- (3) Number of buildings that benefit from the levee failure threat recognition system. _____
- (4) Number of buildings that benefit from the levee failure flood warnings. _____
- (5) Number of buildings that benefit from the levee failure response operations actions. _____

**Levee Failure Recognition (LFR), Levee Failure Warning (LFW), Levee Failure Operations (LFO) and Levee Failure Critical Facilities (LCF)
Credit Criteria and Documentation**

Credit criteria for this activity are described in more detail in Section 621.b of the *CRS Coordinator's Manual*. The community must receive some LM 1 and LM 2 credit and some credit for LFR, LFW, LFO, and LCF to receive any credit under this 620 activity.

(1) The levee system(s) for which the community requests credit (or qualification for credit) must have been designed and constructed as a levee (see Section 120 (Glossary)). Structures such as road and railroad embankments that divert flood waters are not considered “levees” for the purposes of this credit unless it can be documented that they were intended to be levees and were designed and constructed accordingly. Floodwalls are considered levees.

For an accredited levee: A statement signed by the owner of the community levee(s) or a by a licensed professional engineer that states that the levee(s) meets all the NFIP levee recognition requirements; and the community must provide documentation that verifies the inspection, maintenance, and emergency action plan criteria of the accredited levee(s).
[See Attachment _____ Pages _____.]

(2) The levee system(s) for which the community requests credit (or qualification for credit) must be operated and maintained by a public agency. This could be a federal or state agency, a levee district, an office or department of the community, or other public entity.

For the levee(s), being requested for credit, documentation that the levee(s) is operated and owned by a public agency and was designed and constructed using sound engineering practices to contain, control, or divert flood waters in accordance with a designated risk reduction level. [Also provide levee name(s) (e.g., “Salt Creek Levee”) and owner name(s).]
[See Attachment _____ Pages _____.]

(3) The community must submit a map showing the location of each levee and the areas that would be flooded if the levee were to be overtopped or fail and an inventory of the buildings and critical facilities that would be flooded upon overtopping or failure. For each levee, the following information must be submitted:

(a) The approximate protection level of the levee and the expected overtopping elevation, if different.
[See Attachment _____ Pages _____.]

(b) A map of the levee(s) and the area(s) affected should the levee(s) be overtopped or fail. If there are no detailed levee breach maps or levee failure studies, then the map would show the area below the expected overtopping elevation. Guidance for this mapping can be found in Section 621.c.

[See Attachment _____ Pages _____.]

- (c) A list of the addresses of all properties with insurable buildings in the inundated areas. This list is needed for the required outreach project and the impact adjustment (bLF).

[See Attachment _____ Pages _____.]

- (d) A list of the critical facilities that would be flooded or otherwise affected by a failure or by the overtopping of the levee.

[See Attachment _____ Pages _____.]

(4) The community [or levee owner] must have a **levee maintenance plan** that includes annual inspections and an emergency action plan for the levee system(s), and the plans must meet the credit criteria for LM1 and LM2.

(5) The community must implement one or more **outreach projects** to the residents and businesses in the area(s) expected to be inundated by a flood that overtops a levee. The project(s) must tell people about their risk of flooding, how they will be warned of a levee failure flood, the safety measures they should take during a flood (e.g., evacuation procedures and routes), and the benefits of purchasing flood insurance. This can be done by using one or more of the following approaches:

- (a) Sending an outreach project (e.g., a letter, brochure, or newsletter) each year to all properties with insurable buildings in the area(s) subject to a flood that overtops the levee, or

- (b) Developing an appropriate approach as part of a Program for Public Information credited Activity 330 (Outreach Projects).

- Documentation of outreach projects to the residents and businesses in the area(s) which will be inundated by a levee overtopping.

[See Attachment _____ pages _____.]

(6) The community must obtain some credit in all four levee failure warning and response elements (LFR, LFW, LFO, and LCF) to receive credit for its local levee failure and response planning.

(7) To receive LFR, LFW, LFO, and LCF credit, the community must have a **levee failure flood warning and response plan** [or emergency action plan] that has been adopted by the community's governing body. The plan should be part of, and must meet the same criteria as, the community's flood warning and response plan described in Section 611.b(4).

The plan or related document must be marked to show where the credited items appear and must: [See Attachment _____.]

Describe the levee failure threat recognition procedures (LFR), [pages _____.]

Describe the levee failure emergency warning procedures (LFW), [pages _____.]

Describe the levee failure operations and actions (LFO). For full credit for LFO, the plan needs to

(a) Describe the actions to be taken; [pages _____.]

(b) Identify the office or official responsible for the action; [pages _____.]

(c) Define the time needed to carry out the activity; and, [pages _____.]

(d) Contain other critical information that specified agencies and organizations need in order to perform their assigned responsibilities. [pages _____.]

(8) There must be at least one exercise or drill of the levee failure warning and response plan each year. This can be an exercise for a flood, levee failure, dam failure, or hurricane. This criterion can be met if the plan is implemented in response to an actual flood or threat of a levee failure. In either case, there must be an evaluation of the performance of the plan and recommended changes that may be needed, as is usually done in an After-Action Report.

Documentation of the annual levee flood warning and response plan exercise, to include an evaluation of the plan's performance and recommended changes. The exercise must include the procedures for monitoring levee conditions credited under LFW and the procedures for warning people credited under LFW.

[See Attachment _____ pages _____.]

Levee Maintenance (LM) Credit Criteria and Additional Documentation:

The maximum credit for this element is 95 points.

(1) The community must qualify for some LM1 and LM2 credit to receive any LM credit or to qualify for any Activity 620 credit. Levees that are credited by FEMA for mapping purposes are not eligible for credit points under LM, because they already are required to have an adequate maintenance program as a condition of accreditation. Also, there are no LM credit points for a levee owned or operated by a federal agency. All credit points for LM are limited to non-accredited and non-federal levees. (See page 620-7 of CRS Coordinator's Manual.

(2) To qualify for LM1 credit (50 points), the levee system maintenance must:

(a) Ensure that the levee system's stability, height, and overall integrity are maintained. Encroachments must be controlled to ensure that they do not compromise the levee's integrity, hinder operations and maintenance, and/or diminish the ability to engage in flood fighting activities. Maintenance programs must correct problems posed by existing encroachments.

[See Attachment _____ pages _____.]

- (b) Provide **written operations and maintenance procedures** that include:
- (1) Annual inspections of the condition of the levee system (i.e., the levee structure, pump stations, closure devices, etc.); [pages _____.]
 - (2) The maintenance activities to be performed; [pages _____.]
 - (3) The frequency of their performance, and; [pages _____.]
 - (4) The person responsible for their performance (by name or title). [pages _____.]

Copy of the community or levee owner written operation and maintenance procedures. [See Attachment _____ pages _____.]

(c) Perform and document **annual inspections and needed maintenance** of levees and floodwalls, as well as pumps, interior drainage systems, closures, penetrations, and transitions that provide for system integrity.

Documentation that all levees to be credited have been inspected during the previous year and are being maintained in accordance with the procedures and standards of the LM1 plan. [See Attachment _____ pages _____.]

(3) To qualify for LM2 credit (45 points), the [levee owner's] emergency action plan must have a written operations plan or manual that describes what must be done by the agency that owns the levee when a flood occurs.

Copy of the levee owner emergency action plan. [See Attachment _____.]

It must include:

(a) A list of all actions that need to be taken at different flood levels, including:

- (1) Procedures to notify the local emergency managers of a potential problem, [pages _____.]
- (2) All openings and closures that need to be closed and the location of the equipment and materials to effect the closure, [pages _____.]
- (3) Periodic patrols of the levee to detect problems such as erosion and seepage; [pages _____.]

(b) The person or office responsible for their performance (by name or title); [pages _____.]

(c) [Requirements for] Annual inspections of all equipment and material needed for the plan, such as vehicles and stockpiled sandbags; and [pages _____.]

(d) [Requirements for] Annual tests of all closures, pumps, and other equipment needed to implement the emergency action plan. Any equipment that is used routinely throughout

the year, such as vehicles and drainage pumps, do not need testing records for CRS credit. The plan may be in the same document as the LM1 maintenance plan.

[pages _____.]

- Copies of records showing the most recent annual inspection of all equipment and material needed for the LM 2 emergency action plan.

[See Attachment _____ pages _____.]

- (4) The levee maintenance program must be compliant with applicable federal environmental and historic preservation laws and executive orders (see Section 507). Credit is not provided if levee maintenance procedures are not compliant with applicable federal laws and executive orders.

- Completed and signed CC-620EHP, Certification of Compliance with Environmental and Historic Preservation Requirements for Levee Maintenance. CC-620EHP must be signed by each agency that is responsible for the levee maintenance program of each levee.

[Attach signed copy or copies of the CC-620EHP.]

Levee Failure Threat Recognition system (LFR) Credit Criteria and Additional Documentation:

The maximum credit for this element is 30 points.

- (1) The threat recognition procedures must be in the levee failure warning and response plan or a related document.

- (2) To receive LFR credit, some credit points must be obtained under both LFR1 and LFR2.

- (3) For monitoring flood conditions and LFR1 credit (up to 15 points):

- (a) The community and the levee owner must have a flood threat recognition system that monitors conditions. This would be a system that provides early notification of rising waters that may threaten the levee’s integrity. The system must meet the credit criteria of FTR in Activity 610 (Flood Warning and Response). A National Weather Service flood potential outlook or flood watch would also be sufficient.

[See Attachment _____ pages _____.]

- (b) Additional credit is provided for redundant or backup monitoring systems along a levee that send a signal to the emergency manager if water is rising on the landward side of the levee. This system could use automated flood alarms or automated flood warning systems, or it could rely on trained spotters.

[See Attachment _____ pages _____.]

- (c) The equipment used for the flood monitoring must be tested at least annually. For CRS credit, testing records are not needed for equipment that is used routinely throughout the year, such as radios and vehicles.

[See Attachment _____ pages _____.]

- Copies of records showing the most recent annual test of all equipment and material needed for the system.

[See Attachment _____ pages _____.]

(4) For LFR2 credit (up to 15 points), the community and/or the levee owner must initiate the monitoring of levee conditions when certain, pre-defined flood conditions are present, and

(a) The monitoring procedures must cover:

- (a) Levee patrol staffing and assigned sections of the levee system; [pages _____.]
- (b) How and when the patrol teams are activated; [pages _____.]
- (c) What the patrols are to look for in the different sections; [pages _____.]
- (d) Methods and frequency for reporting; and, [pages _____.]
- (e) How the community’s emergency managers are kept posted on the situation. [pages _____.]

(b) The procedures for monitoring levee conditions must be exercised at least once each year.

[See Attachment _____ pages _____.]

- Copy or link to the impact adjustment map showing the area(s) affected by each element and documentation showing how the numbers of buildings used in the calculations were determined.

[See Attachment _____ pages _____.]

Levee Failure Warning (LFW) Credit Criteria and Additional Documentation:

The maximum credit for this element is 50 points.

(1) The warning procedures must be included in the levee failure warning and response plan or a related document.

[See Attachment _____ pages _____.]

(2) The warning must reach people in a timely manner, especially because there may not be much lead time between a sudden levee failure and the moment when water reaches homes and businesses. For example, television or radio announcements are not credited if they are the only approach used because the failure may occur during the night.

[See Attachment _____ pages _____.]

(3) For those warning systems requiring specialized equipment, such as sirens, the equipment and procedures must be tested at least annually. Equipment that is used routinely throughout the year, such as television notices and message boards, does not need testing records for CRS credit.

Records showing the most recent annual test of all equipment and material needed for the system.
[See Attachment _____ pages _____.]

- (4) LFW1 (5 points): If the plan includes pre-scripted messages and guidance for staff to quickly issue appropriate warnings keyed to specific triggers, such as when the river reaches a certain level, or when sand boils appear. [See Attachment _____ pages _____.]
- (5) LFW2 (5 points): If the public messages include information on the expected elevation of the flood waters and instructions on when to evacuate. [See Attachment _____ pages _____.]
- (6) LFW3 (10 points): If an outdoor voice-sound system or fixed siren system is used. [See Attachment _____ pages _____.]
- (7) LFW4 (either 2 points or 10 points): Two points if the plan identifies the primary and support agencies responsible for door-to-door or mobile public address warnings, or ten points if the plan identifies the routes, procedures, staff, and equipment necessary for door-to-door or mobile address warning. [See Attachment _____ pages _____.]
- (8) LFW5 (10 points): If the Emergency Alert System through all channels/stations with pre-scripted draft messages is used. [See Attachment _____ pages _____.]
- (9) LFW6 (10 points): If telephone warnings to residents and businesses are used. [See Attachment _____ pages _____.]
- (10) LFW7 (10 points): If all schools, hospitals, nursing homes, prisons and similar facilities that need special flood warning have NOAA Weather Radio receivers and at least one other automated backup system for receiving flood warnings, provided that the community has coordinated with NOAA and there are arrangements for issuing warnings about levee failures. [See Attachment _____ pages _____.]

Levee Failure Operations (LFO) Credit Criteria and Additional Documentation:

The maximum credit for this element is 30 points.

- (1) The levee failure response operations actions must be in the levee failure warning and response plan or a related document. [pages _____.]
- (2) Levee protection operations actions must be closely coordinated with the levee emergency action plan credited under Section 622.a (LM2). [pages _____.]
- (3) Credit is based on the extent and level of detail that the levee failure warning and response plan provides for the response operations. General statements or an assignment of

responsibilities with no specifics about what is done are not credited. For full credit for LFO, the plan needs to:

- (a) Describe the actions to be taken; [pages _____.]
 - (b) Identify the office or official responsible for the action; [pages _____.]
 - (c) Define the time needed to carry out the activity; and, [pages _____.]
 - (d) Contain other critical information that designated agencies and organizations need in order to perform their assigned responsibilities. [pages _____.]
- (4) Credit is provided in LFO4 if there is a list of the personnel, equipment, facilities, supplies, and other resources needed to complete each task in the levee failure warning and response plan. For full credit, the list must identify what is available within the community and what is needed from private suppliers or other jurisdictions.
- Provide a copy of list(s) of the personnel, equipment, facilities, supplies, and other resources needed to complete each task in the levee failure warning and response plan. [See Attachment _____ pages _____.]
- (5) LFO1 (10 points): If the community has developed scenarios that review what could happen if the levee were to fail or be overtopped by a flood. [See Attachment _____ pages _____.]
- (6) LFO2 (10 points): If the plan identifies response tasks and responsible community staff and other public and private organizations with responsibilities related to the response tasks in the plan. [See Attachment _____ pages _____.]
- (7) LFO3 (5 points): For maintaining a data base of people with functional/special needs who require evacuation assistance when a levee failure warning is issued and for having a plan to provide transportation to secure locations. [See Attachment _____ pages _____.]
- (8) LFO4 (up to 10 points): If the plan includes a summary of estimated staff, equipment, supplies and time required for each response task and if the plan identifies the sources of necessary resources. [See Attachment _____ pages _____.]

Levee failure Critical Facilities planning (LCF) Credit Criteria and Additional Documentation:

The maximum credit for this element is 30 points.

- (1) LCF1 is a prerequisite for any LCF credit.
- (2) For LCF1 credit (up to 15 points), the community’s levee failure response plan must list the facilities considered critical in a levee failure emergency. The community must contact the facilities to determine whether they need any special warning arrangements. The community

does not need to provide a special warning to all critical facilities, only to those identified in the levee warning and response plan as needing one. There is no impact adjustment for LCF1. The community must include all critical facilities affected by a levee failure on its list.

Provide a list of all public and private critical facilities affected by levee failure or needed to be operational during a levee failure flood.

[See Attachment _____ pages _____.]

Provide the contact information, email addresses, phone numbers and names of the operators of all public and private critical facilities affected by levee failure.

[See Attachment _____ pages _____.]

Provide documentation of arrangements for issuing special warnings or early notifications directly to those critical facilities that need advance warning.

[See Attachment _____ pages _____.]

(3) For LCF2 credit (up to 15 points) if critical facilities listed under LCF1 have their own levee failure response plans that have been developed, reviewed or accepted by the community. The credit is prorated based on the percentage of affected critical facilities that have creditable plans.

Copies or list of levee failure warning and response plans accepted by the community for individual critical facilities.

[See Attachment _____ pages _____.]
