Rehabilitation of High Hazard Potential Dams
FEMA Grant Program

(Hazard Mitigation and Floodplain Management)

Association of State Floodplain Managers
Cleveland Ohio
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Presentation Overview

• The Enabling Legislation
• Program Objectives
• General Requirements
• Specific Requirements
  • Risk prioritization of projects
  • Hazard Mitigation Plan
  • Floodplain Management Plan
• 2019 rollout
The Legislation - The Act

• Water Infrastructure Improvements for the Nation Act” or the “WIIN Act,“

• Authorized a grant program under FEMA’s National Dam Safety Program

• For the “Rehabilitation of High Hazard Dams, provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of eligible high hazard dams”
The Legislation- Funding

• Authorized in 2016 for $445 M over 10-years

(j) Authorization of appropriations:
   (1) $10,000,000 for FY 2017 and 2018;
   (2) $25,000,000 for FY 2019;
   (3) $40,000,000 for FY 2020; and
   (4) $60,000,000 for each of FY’s 2021-26

• No funds were appropriated in 2017 and 2018

• In 2019 $10M was appropriated
Program Objectives

• Provide financial assistance for rehabilitation
• Encourage state, local, and territorial governments to consider all dam risks in mitigation planning
• Promote community preparedness by requiring recipients to develop and implement Floodplain Management Plans
• Reduce potential consequences to life and property
• Promote Emergency Action Plan (EAP) implementation, compliance, and exercise
• Incentivize the use of risk prioritization in state dam safety programs
• To be eligible for HHPD funding, the dam must:
  ✓ Be located in a State with a State dam safety program
  ✓ Be classified as “high hazard potential” by the State
  ✓ Have an approved Emergency Action Plan (EAP)
  ✓ Fail to meet minimum State dam safety standards and pose an unacceptable risk to the public (as determined by the State)

• Eligible dams do not include
  x Federally owned
  x Licensed hydroelectric dams
  x Dams built under the authority of the Secretary of Agriculture
Eligible Dams (continued)

• States define number of eligible dams

• States determine which dams meet the definition of “unacceptable risk to the public”

• Specific to the HHPD, FEMA has developed a minimum standard for “unacceptable risk to the public”

• The number of eligible dams is part of the funding formula written in the Act
A dam poses **unacceptable risk to the public** when the dam requires remediation or risk reduction measures due to deficiencies caused by inadequate dam design, construction methods, or the results of inadequate operation and maintenance.

For a dam to be considered an **unacceptable risk to the public** for funding under the HHPD Grant Program, it must meet all the following conditions:

1. Does not meet the minimum dam safety standards of the state (not including operations and maintenance actions)
2. State dam safety program has documented the deficiencies at the dam that must be reduced, eliminated, or mitigated
3. Official notice of the determination of the documented deficiency (s) has been communicated to the dam owner to address the **unacceptable risk to the public** to implement interim risk reduction measures until permanent risk reduction measures are implemented in a manner that is acceptable to the state. **Official documentation must be on official state or state dam safety program letterhead and may include official citations issued from the state dam safety program to the dam owner.**
Eligible Dams- eligible activities

Eligible activities include:
- Repair
- Removal
- Any other structural or nonstructural measures to rehabilitate an eligible high hazard potential dam

Ineligible activities include:
- Rehabilitation of a Federal dam
- Routine operation or maintenance
- Modification to produce hydroelectric power
- Increasing water supply storage capacity
- Any other modification to a dam that does not also improve the safety of the dam

Projects must be approved by the relevant State dam safety agency.
For FY2019, the HHPD will provide assistance for planning and other preconstruction activities toward the repair, removal or structural / nonstructural rehabilitation of eligible high hazard potential dams.

- Preliminary Engineering Studies
  - Dam risk and consequence assessments
  - Feasibility studies
  - Alternatives analyses and preliminary engineering
  - Mapping, survey, and inundation modeling
- Engineering Design and Development of Specifications
- Outreach
  - Public education and awareness of flood risk
  - Training and Exercises to prevent or respond to dam incidents
Eligible Dams - Sponsors

• Non-Federal sponsor is defined as:
  • a governmental organization
  • a nonprofit organization

• Sponsors must be able to meet the cost-sharing requirement of not less than 35 percent

• States will always be the recipient and can be the sponsors or may act as pass-through entities to other non-Federal sponsors
Grant funding will be allocated based on a formula:

- $\frac{1}{3}$ shall be distributed equally among the States in which the projects for which applications are submitted.
- $\frac{2}{3}$ shall be distributed based on the proportion of:
  - the number of eligible high hazard potential dams in the State
  - the number of eligible high hazard potential dams in all such States

- Not to exceed the lesser of 12.5% of the total amount of funds made available, or $7,500,000.

- There is a non-Federal cost-sharing requirement of not less than 35 percent (may be in-kind contributions).
Key Requirements of the Act

• **Key Requirements outlined in 467f-2:**
  - Risk prioritization of projects to receive grants
  - Hazard Mitigation Plan requirement
  - Floodplain Management Plan requirement
  - Operations & Maintenance Plan requirement

• **FEMA is developing specific guidance for each of the key requirements**
  - Consistent with the language of the Act
  - Consistent with other FEMA guidance and grant programs
(f) Priority system

The Administrator (FEMA), in consultation with the Board (National Dam Safety Review Board), shall develop a risk-based priority system for use in identifying eligible high hazard potential dams for which grants may be made under this section.

- **States will prioritize grant sub-applications**
- **States with existing risk-based prioritization methodology can use their methodology if it meets minimum FEMA requirements**
- **FEMA will provide new guidance consistent with FEMA P-1025 for states that need a methodology**
## Example (Failure Modes)

<table>
<thead>
<tr>
<th>Static Failure Mode Criteria</th>
<th>Hydrologic Failure Mode Criteria</th>
<th>Seismic Failure Mode Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>~AEP &lt; 1:1000</td>
<td>Dam can pass between a 1,000-year and a PMP storm without overtopping (unless dam is designed to overtop)</td>
<td>Seismic Factor of Safety &gt; 1.1 for maximum design earthquake OR 2% Probability of Exceedance in 50 years peak ground acceleration (PGA) &lt; 0.2</td>
</tr>
<tr>
<td><strong>Moderate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:100 – 1:1000 AEP</td>
<td>Dam can pass between a 100-year and 1,000-year storm without overtopping (unless dam is designed to overtop)</td>
<td>Seismic Factor of Safety &gt; 1 for operating basis earthquake but &lt; 1 for maximum design earthquake OR 0.2 &lt; 2% Probability of Exceedance in 50 years peak ground acceleration (PGA) &lt; 0.3</td>
</tr>
<tr>
<td><strong>High</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:10 – 1:10 AEP</td>
<td>Dam can pass between a 10-year and a 100-year storm without overtopping (unless dam is designed to overtop)</td>
<td>Seismic Factor of Safety &lt; 1 for operating basis earthquake OR 0.3 &lt; 2% Probability of Exceedance in 50 years peak ground acceleration (PGA) &lt; 0.6</td>
</tr>
<tr>
<td><strong>Very High</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>~AEP &gt; 1:10</td>
<td>Dam can pass less than a 10-year storm without overtopping (unless dam is designed to overtop)</td>
<td>Seismic Factor of Safety &lt; 1 for ground motions with an annual probability of exceedance of 1 in 10 years OR 2% Probability of Exceedance in 50 years peak ground acceleration (PGA) &lt; 0.6</td>
</tr>
<tr>
<td><strong>Additional Considerations</strong></td>
<td>persistent dam safety issues noted in past inspections that have not been addressed over the years, past seepage history, instrumentation readings, known design and/or construction deficiencies, and non-routine operational issues</td>
<td>whether the embankment and/or foundation is comprised of liquefiable materials</td>
</tr>
</tbody>
</table>

**Risk-Based Priority System**

- **Static Factor of Safety**
  - **1.5 > SFS > 1.2**
  - Most recent inspection indicates no significant deficiencies related to dam condition
  - OR

- **1.2 > SFS > 1.1**
  - Most recent inspection indicates one or more significant deficiencies related to dam condition
  - OR

- **1.1 > SFS > 1**
  - Most recent inspection indicates one or more major deficiencies related to dam condition
  - OR

- **SFS < 1**
  - Most recent inspection indicates severe deficiencies that are likely to cause failure of the dam in the short-term (within the next 10 years)
  - OR

### Risk-Based Priority System

- **Low**
  - ~AEP < 1:1000

- **Moderate**
  - 1:100 – 1:1000 AEP

- **High**
  - 1:10 – 1:10 AEP

- **Very High**
  - ~AEP > 1:10

- **Additional Considerations**
  - persistent dam safety issues noted in past inspections that have not been addressed over the years, past seepage history, instrumentation readings, known design and/or construction deficiencies, and non-routine operational issues
  - OR

### Risk-Based Priority System

- **Spillway Redundancy**
  - Condition of the spillways, whether the dam has previously overtopped, and non-routine operational issues
  - OR

- **Embankment and/or Foundation**
  - Whether the embankment and/or foundation is comprised of liquefiable materials
  - OR
## Example (Consequences)

<table>
<thead>
<tr>
<th>Population At Risk (PAR) and Warning Time</th>
<th>Economic Losses</th>
<th>Environmental Losses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAR 1-10 and warning time is considered sufficient to evacuate most persons from the inundation area</td>
<td>Less than $10 Million</td>
<td>losses could be sustained as a result, but remediation is possible</td>
</tr>
<tr>
<td><strong>Moderate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAR 10-100 and warning time is considered sufficient to evacuate the majority of persons from the inundation area</td>
<td>$10 Million - $100 Million</td>
<td>losses could be remediated, but would take several years</td>
</tr>
<tr>
<td><strong>High</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAR &gt; 100 and warning time is considered sufficient to evacuate some of the persons from the inundation area</td>
<td>$100 Million - $1 Billion</td>
<td>losses are expected to be significant and could be remediated, but would take many years</td>
</tr>
<tr>
<td><strong>Very High</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAR &gt; 100 and warning time is not sufficient to evacuate the majority of the persons from the inundation area</td>
<td>Exceed $1 Billion</td>
<td>losses would likely be severe and permanent</td>
</tr>
<tr>
<td><strong>Additional Considerations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of critical facilities (such as hospitals, fire stations, police stations, emergency operation centers, and schools) within the inundation zone and whether the EAP is current and has been recently exercised</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Risk-Based Priority System

- D = Dam, P = Project
- Each dam has one project except for Dam 2, which has two projects.
- Dam 2 project 1 involves capital improvements.
- Dam 2 project 2 involves capital improvements in addition to purchasing a large residential area in the dam breach inundation zone.
Hazard Mitigation Plans

(b) Hazard Mitigation Plan

have in place a hazard mitigation plan that-
(i) includes all dam risks; and
(ii) complies with the Disaster Mitigation Act of 2000 (PL 106-390; 114 Stat. 1552) aka DMA 2K

• To receive the grant the non-Federal sponsor must:
  • Participate in, and comply with all applicable Federal flood Insurance Programs
  • Have a hazard mitigation plan that includes “all dam risks” and complies with DMA 2K

• FEMA is developing guidance specific to including dams in Disaster Mitigation Act of 2000 plans
Hazard Mitigation Plans

• Applicant’s state and Sub applicant's local hazard mitigation plan will be assessed against 44 CFR Part 201:
  • Does the plan describe how the state dam safety agency participated in the **planning process** and contributed expertise, data, information, etc. relative to high hazard potential dams?
  • Does the plan address the high hazard potential dams in the risk assessment, including a description of the **risk-based priority system**?
  • Does the plan include **mitigation goals** to reduce long-term vulnerabilities from high hazard potential dams that pose an unacceptable risk to the public?
  • Does the plan prioritize **mitigation actions** to reduce vulnerabilities from high hazard potential dams that pose an unacceptable risk to the public?
Hazard Mitigation Plans

- Applicant’s state hazard mitigation plan will be assessed against 44 CFR Part 201 will be checked for these additional elements:
  - Does the plan identify current and potential sources of funding to implement mitigation actions and activities for high hazard potential dams that pose an unacceptable risk to the public?
  - Does the plan generally describe and analyze the effectiveness of local mitigation policies, programs, and capabilities that address high hazard potential dams that pose an unacceptable risk to the public?
  - Does the plan describe the criteria for prioritizing funding for high hazard potential dams that pose an unacceptable risk to the public?
Hazard Mitigation Plans

- FEMA may grant an extension for extraordinary circumstances when justification is provided and approved prior to the application deadline.
- The mitigation plan must include all dam risk and be approved by FEMA within twelve (12) months of the award.
- Extraordinary circumstances may exist when:
  - The jurisdiction meets the definition of small impoverished community.
  - The jurisdiction has been determined to have had insufficient capacity due to a lack of available funding, staffing, or other necessary expertise to satisfy the mitigation planning requirement prior to the application deadline.
(e) Floodplain management plans

(1) In general As a condition of receipt of assistance under this section, the non-Federal sponsor shall demonstrate that a floodplain management plan to reduce the impacts of future flood events in the area protected by the project-

   (A) is in place; or
   (B) will be-

      (i) developed not later than 1 year after the date of execution of a project agreement for assistance under this section; and
      (ii) implemented not later than 1 year after the date of completion of construction of the project.
Floodplain Management Plans (continued)

• The Floodplain Management Plan must address
  • Potential measures, practices, and policies to reduce:
    • Injury and loss of life
    • Damage to property and facilities
    • Public expenditures
    • Other adverse impacts of flooding in the project area
  • Plans for flood fighting and evacuation
  • Public education and awareness of flood risks
What is Planned for 2019

• Available funding: $10,000,000
• Year 1 projects will focus on planning level studies and designs not requiring NEPA approvals for construction
• On May 22, 2019, the Notice of Funding Opportunity (DHS-19-MT-041-00-01) is scheduled to be published to provide instructions on how to apply
• Application period open for 60-days
• Grants will be awarded by September 30, 2019
• Grants will have a 3-year (36 month) Period of Performance (POP)
Questions