

# NCMA EAP

A Brief Summary



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# DAMS

## Safety is Essential

- ◆ 1977 - President Carter mandated a requirement for Federal Dam Safety Regulations
- ◆ 1994 – Interagency Committee of Dam Safety created the current dam classifications
- ◆ 1996 – National Dam Safety Program Act was established
- ◆ 1998 – Federal Guidelines for Dam Safety officially established
- ◆ Dam failures can and do happen even now
- ◆ Smaller dams actually pose a greater threat than larger ones
- ◆ However, only 4 people have died in North Carolina since 1967
  - ◇ NC Dam Safety Law
- ◆ Due to successful implementation of Emergency Action Plans (EAPs)



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# WHAT IS AN EAP?

## Emergency Action Plans in General

- ◆ Formal Document
- ◆ Identifies the potential issues/conditions with a dam
  - ◇ Potential problems that might occur over time/during storms
- ◆ Can help both members of the NCMA staff, consulting engineers, and emergency personnel
- ◆ Assist everyone involved with coordinating emergency management effort







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# HOW DO THEY HELP?



- ◆ Discussion of potentially dangerous conditions that can occur
- ◆ List of the correct actions to take in the event of an emergency
- ◆ Lists who to contact in the event of an emergency to aid in warnings and evacuations

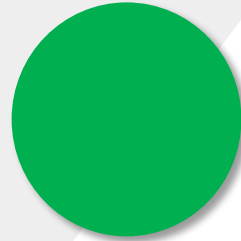


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# LEVELS OF EMERGENCIES

Level 3: Green



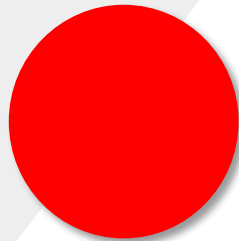
Unusual Event. Pose no current threat, but should be acknowledged. Slowly developing

Level 2: Yellow



Emergency Event. A rapidly developing situation. Potential dam failure

Level 1: Red



Urgent Emergency Event. A dam failure is either imminent or occurring. There is no prevention possible. Emergency action is necessary



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# LEVEL 3 EMERGENCIES

## Unusual Event

- ◆ Not yet a threat to the operation or structural integrity of the dam
  - ◇ Dam still must be monitored, particularly during storms, to make sure there is no further development
- ◆ Best to contact the NC Dam Safety Office as well as the consulting civil engineer to look over the situation and recommend any additional actions
- ◆ Refer to figure 2.1 (page 11) for the list of steps to take in Level 3 Events.
- ◆ Examples include new cracks or erosion that are starting to appear in a previously intact area and new water seepage in or even close to the dam



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# LEVEL 2 EMERGENCIES

## A Rapidly Developing Situation

- ◆ Level 2 indicates a situation that is rapidly developing, but it is not yet a dam failure
- ◆ The situation needs to be carefully monitored and reported on
  - ◇ If this situation continues to get worse, evacuation may be necessary
- ◆ If there is time, consulting engineer will evaluate the situation and recommend ways to prevent dam failure
- ◆ Refer to figure 2.2 (page 12) for the list of steps to take in Level 2 Events.
- ◆ Examples include piping of water along an outlet pipe, tree roots, and utility conduits which could lead to the undermining of the dam



# LEVEL 1 EMERGENCIES

## An Urgent Emergency Event

- ◆ An extremely urgent situation
    - ◆ Dam failure imminent or in progress
  - ◆ At this point, there are no preventative measures are possible
  - ◆ Evacuation of any potential flooding area is necessary
    - ◆ Use Table 5.1 as a list of residents who should be contacted for evacuation (page 49)
  - ◆ Refer to figure 2.3 (page 13) for the list of steps to take in Level 1 Events.
- ◆ Examples: a sinkhole that is appearing quickly, the dam is overtopping or a spillway is starting to erode







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# USING YOUR EAP

# YOUR NEW EAP TEMPLATE

- ◆ The NC template has been edited to meet the needs of the NCMA dam
- ◆ It's designed to help you through the four-step process of an Emergency Action Plan

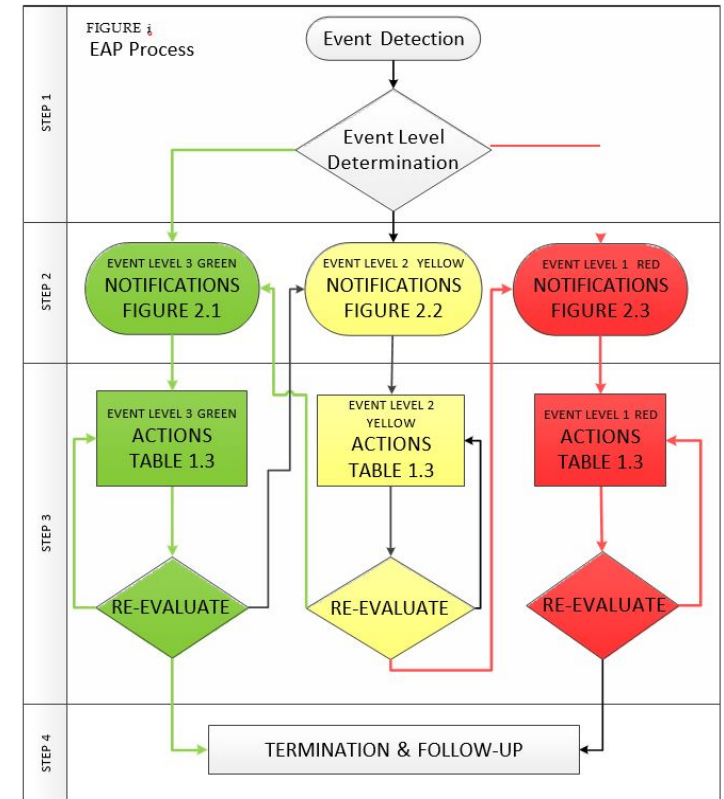




# THE FOUR STEPS OF AN EAP

The steps we use to detect and respond to any dam abnormalities

- ◆ Step 1: Detection and Determination
  - ◇ Noting an event
  - ◇ Determine the level of threat that it represents
- ◆ Step 2: Notification and Communication
  - ◇ Inform the proper channels
  - ◇ If this is a new development of an existing situation, communicate changes
- ◆ Step 3: Actions
  - ◇ Take the recommended actions in the EAP
- ◆ Step 4: Termination and Follow Up
  - ◇ End the actions and follow up on any revisions to the EAP that need to be made
  - ◇ If a Level 1 situation, de-brief





# HOW ARE EMERGENCIES DETECTED?

- ◆ Observations around the dam and from previous inspection
- ◆ Instrument data
- ◆ Any earthquakes that can be felt around or near the dam
- ◆ Severe weather or flashflood warnings







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# STEP 1: DETECT AND DETERMINE

What do to when something is noticed

- ◆ When an event is detected or determined. It must be reported to the owner (Katherine White)
  - ◇ Her information can be found in Figure 2.1, 2.2., and 2.3 (pages 11-13)
- ◆ If necessary, reference Table 1.3 (page 8) for a list of possible issues and the level of threat that they represent
- ◆ If the event you've noticed is not something on the list, then consider most similar event





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# STEP 2: COMMUNICATION

## Who to speak to



- ◆ Depending on the evaluated level of threat, different messages are recommended
  - ◇ Level 3 problems can usually wait until regular business hours
  - ◇ Level 2 and 1 are more urgent
- ◆ When calling in a Level 3 or Level 2 threat, the Civil Engineer (Ted Bartelt) should be contacted so preventative steps can be taken
  - ◇ If the threat reaches Level 1, only emergency services should be reached
- ◆ Appendix B and C contain different local emergency resources
- ◆ If required, a broadcasted phone message must be sent out to people at risk referenced in Table 5.1. (page 49)





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# STEP 3: ACTIONS TO TAKE

## What to do in a given situation

- ◆ Your EAP has multiple Action Sheets and Emergency Event Logs that can be used in a given situation
  - ◇ The action sheets are to be used as guidance
  - ◇ If something isn't listed, use the most similar event
- ◆ At least two people should act in an Emergency
  - ◇ One person to handle on-site actions
  - ◇ One person to make proper notifications
- ◆ The event log on Form 3.2 (page 41) must also be filled out and kept as a record

<b>LEVEL 3 GREEN</b>		<b>EARTH SPILLWAY FLOW</b>	<b>Sheet A3</b>
Defined as: "Spillway is flowing with no active erosion" (Link to Table 1.3 Level GREEN "Conditions").			
<b>RECOMMENDED ACTIONS</b>			
<i>Owner/EAP Coordinator: Katherine White</i>			
<ol style="list-style-type: none"> <li>1. Make sure Level 3 GREEN notifications in Figure 2.1 have been made.</li> <li>2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected without compromising the safety of anyone performing these tasks. Monitor water levels and spillway area for erosion every two hours.</li> <li>3. Monitor Off-site areas to include instrumentation. (Applicable to all Action Data Sheets with reference to Instrumentation)</li> <li>4. Record all information, observations, and actions on an Event Log Form (Form 3.2).</li> <li>5. Contact the <u>Ted L. Bartelt, PE</u> at least daily to report the latest observations and conditions. If conditions change significantly, go to re-evaluation/decision section and follow relevant steps immediately.</li> </ol>			
<i>Owners Engineer: Ted L. Bartelt, PE</i>			
Review all pertinent information to recommend appropriate actions to the <u>Katherine White</u> in conjunction with <u>NC Dam Safety Staff</u> . Provide oversight to corrective actions or work as required. Observe conditions in site periodically and provide decision support as appropriate.			
<u>NC Dam Safety Staff</u>			
Provide decision and technical support to <u>Herbert Griffin – Fire Chief</u> as appropriate.			
<b>RE-EVALUATION / DECISION Based upon Table 1.3</b>			
Evaluate conditions at least daily, or when conditions change significantly. <u>Using Table 1.3</u> , determine whether:			
A. The event can be terminated when spillway flows cease.			
B. The event remains at the current Event Level 3 (No change in situation).			
C. The event warrants escalation (when spillway flows produces active erosion of channel or spillway flow that may result in flooding of people downstream if water continues to rise (Link to Table 1.3 Level Yellow "Conditions").			
D. Notify all contacts on the Notification Flow Chart to advise of current situation and anticipated strategies.			
<b>Based on this determination, follow the appropriate actions</b>			
<b>A) TERMINATION</b>	<b>B) EVENT LEVEL 3 (NO CHANGE)</b>	<b>C) EVENT LEVEL ESCALATION</b>	
Go to Termination and Follow-Up (Step 4)	Continue recommended actions on this sheet	Go to Event Level 2 or Event Level 1 Steps 2 & 3	



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# STEP 4: TERMINATION

## What to do after an Event



- ◆ Termination can only happen after action during Level 3
- ◆ If Level 2 was declared, situation must be recorded as a level 3 before it can be terminated
- ◆ If Level 1, the dam must be inspected and repair plans made so that the situation that caused Level 1 does not repeat





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# STEP 4: FOLLOW UP

## Moving forward

- ◆ Levels 3, 2, and 1
  - ◇ Owner contacts all involved parties no later than a week after the event
  - ◇ Evaluate the EAP procedures and how effective they were
  - ◇ Owner inserts recommendations for revisions and updates to the EAP within 30 days of follow up
- ◆ In case of injury or loss of life
  - ◇ Independent review of the event and EAP will be necessary
    - ◆ Performed by a professional engineer





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# APPENDIX A: ROLES AND RESPONSIBILITIES



- ◆ Quick guide to what is expected of each person involved in the EAP
  - ◇ Also an indication of who should be contacted during different events
- ◆ Should be used to make sure there is no confusion about duties





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# APPENDIX B: EMERGENCY SERVICES CONTACTS

- ◆ Who to contact in various emergencies that might occur
- ◆ Should be contacted in the event of an emergency, depending on the Action Sheet
- ◆ Should be readily available and kept up to date



# APPENDIX C: LOCAL RESOURCES



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- ◆ Equipment, labor, and materials that are available to the NC Museum of Art
  - ◇ Able to be used in preventative measures
- ◆ Contact information and information regarding the kind of service provided





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# APPENDIX D: REVIEW AND REVISIONS

- ◆ Annual Review
  - ◇ There to verify/update all who might be impacted and their contact info
  - ◇ See if conditions have changed
  - ◇ Update information on emergency services and resources.
  - ◇ Performed by Owner's Engineer
- ◆ EAP Periodic Test
  - ◇ Recommended every 5 years
  - ◇ Test of Level 2 event situation
  - ◇ Determine the effectiveness of the EAP
  - ◇ Note any ways to improve
  - ◇ Create and submit revisions
- ◆ Revisions
  - ◇ All revisions should be sent to NC Dam Safety and all other share holders listed in Appendix F
  - ◇ Most recent version of the EAP should be in possession of the Museum's Safety Director
  - ◇ Appendix E contains a record of all revisions and updates.

# THANK YOU!

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