

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

STATEMENT OF:

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U.S. ARMY CORPS OF ENGINEERS

BEFORE

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COMMITTEE ON APPROPRIATIONS

UNITED STATES SENATE

ON

LESSONS FROM THE 2010 TENNESSEE FLOODS

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INTRODUCTION

Mr. Chairman and members of the Subcommittee, I am Major General John Peabody, Commander of the Great Lakes and Ohio River Division, U.S. Army Corps of Engineers. Thank you for the opportunity to testify about the Corps' response to the Cumberland River Basin flood event that occurred in May 2010. The Corps' intent has consistently been to objectively and dispassionately review the facts behind this event, transparently communicate our findings to the public, and work to improve our operations and processes for the future. One of the primary missions of the U.S. Army Corps of Engineers is to support flood risk management activities of communities in both urban and rural areas throughout the United States. To carry out this mission, the Corps operates projects that reduce flood risk and conducts emergency management activities. The Corps' priority during flooding is to protect human life and property. We perform this mission as part of an interagency team with our Federal, State, and municipal agency partners. The Corps is also responsible for providing timely, accurate flow release information from our flood risk management projects to the National Weather Service so that it can be used to make flood predictions and public notification.

WHAT HAPPENED

The weather forecast on April 28, 2010 predicted a significant rainfall event for the weekend of May 1-2, 2010. At that time, the Corps ran models that predicted the flood risk management projects in the Cumberland basin would minimize any flooding within their drainage areas. In order to increase confidence in our capacity to store stormwater runoff, the Corps proactively lowered pool levels at Cordell Hull and Old Hickory by a half foot and Cheatham Lake by one foot. The massive rain event over the next few days resulted in total rainfall nearly three times the maximum amount originally predicted and well beyond what we had modeled.

The historic and heavy rainfall was concentrated in the Nashville-Franklin area, with Nashville receiving more than 13 inches of rainfall in 36 hours, more than doubling the previous two-day rainfall record. Some areas exceeded 17 inches of rain - the highest amount in over 140 years of record and estimated to be well above a 1000-year rainfall event. The first round of storms on May 1 caused sharp rises in nearly all streams and rivers. The second round of storm activity on May 2 fell on already saturated ground and rapidly flowed into creeks and rivers already at flood stage, thereby causing large-scale severe flooding along the Cumberland and lower Tennessee Rivers and their tributaries.

Nashville District personnel responded proactively and in some cases heroically to this extremely dangerous weather event. Some personnel left their homes to be flooded while they worked to reduce flooding along the entire system. They managed water flow to within inches of overtopping three Corps projects – an extraordinarily dangerous situation, rapidly provided sandbags to prevent the loss of the Omohundro water treatment plant, and preliminary analysis indicates that operations of the Corps projects reduced the Cumberland River flood crest in Nashville by approximately five feet.

The Corps is responsible for ten multi-purpose projects in the Cumberland River Basin. Two of these projects, Martins Fork and Laurel, are located on small tributaries upstream of Wolf Creek Dam and only provide flood risk management benefits locally. The remaining eight projects consist of four flood risk management projects, three navigation projects, and one hybrid project that provides both flood risk management and navigation benefits. Wolf Creek, Dale Hollow, Center Hill, and J. Percy Priest are congressionally authorized, designed and primarily operated for flood risk management and hydropower. Wolf Creek is on the Cumberland River whereas Dale Hollow, Center Hill and J. Percy Priest are on tributaries. The Corps flood risk management projects do not capture all of the drainage within the basin. The multi-purpose project at Barkley provides valuable flood risk management benefits for the lower Ohio and Mississippi Rivers. Basin wide, approximately 56% of the watershed is located upstream of a Corps flood control project. The remaining 44% is referred to as uncontrolled drainage. Cordell Hull, Old Hickory, and Cheatham are congressionally authorized, designed and primarily operated for navigation and hydropower. These projects cannot store large volumes of water and do not make a meaningful contribution to flood risk management. Their local drainage areas are uncontrolled. Barkley supports navigation and provides flood risk management benefits for the lower Ohio and Mississippi Rivers.

Wolf Creek, Dale Hollow, Center Hill, and J. Percy Priest are the projects designed and operated for flood risk management that were able to have the greatest impact on reducing the flood crest. Unfortunately, the heaviest rainfall occurred in other drainage areas uncontrolled by flood risk management projects, where the Corps could not influence water flows. The Corps was not able to use the full storage capacity of Wolf Creek, Dale Hollow, and Center Hill because the storm's heaviest rainfall fell to the southwest of these projects. The reservoir at J. Percy Priest, located just upstream of Nashville, was completely filled during this event. On May 3rd, the flood storage capacity at J. Percy Priest was exceeded requiring operation of the spillway gates to avoid overtopping the dam and risking a catastrophic failure of the project.

Cordell Hull, Old Hickory, and Cheatham are designed and primarily operated for navigation. These projects were not designed to provide flood storage capacity. The Cheatham navigation project was overtopped and went to uncontrolled flow at 7:00 p.m. on May 1. Spillway gate operations were required at Cordell Hull and Old Hickory to prevent overtopping and losing control of water releases.

The Corps was in communication with and coordinated with the National Weather Service and state and local Emergency Management officials before, during and after this event.

AFTER ACTION REVIEW

The Corps recently conducted a comprehensive, internal after action review, in consultation with our partner agencies, including the NWS, USGS, TEMA, and TVA.

The report highlights 28 issues categorized in three key areas: water management, emergency management, and communications.

WATER MANAGEMENT

The weather forecast alerted the Corps to the upcoming rainfall event, allowing our water management professionals to evaluate potential system impacts. As a result of this evaluation the Corps took proactive measures to reduce pool levels and to alert Corps emergency managers.

An unprecedented amount of rainfall fell during this event, and was met by necessary actions on the part of all agencies involved to protect life and property. Corps continues to work progressively with the National Weather Service to improve joint operating models, implement new reservoir inflow forecasts, and capitalize on a long standing history of working together cooperatively, consistent with newer initiatives such as the Integrated Water Resources Science and Services (IWRSS). Project operations are guided by water control manuals which do not currently address our most extreme weather events. The enormous magnitude of this event has caused us to reconsider our worst case weather scenarios. The Corps will evaluate project operation plans for their capability to respond to such events. Specific to this flood event, the Corps is developing a post flood report designed to gain a comprehensive technical understanding of the engineering aspects of this flood.

EMERGENCY MANAGEMENT

The importance of communications and pre-event coordination with the Tennessee Emergency Management Agency cannot be overstated for this or any natural disaster event. Under Corps Authority, Public Law 84-99, pre-event staging of basic flood fight equipment such as sandbags, early identification of professional Corps personnel to provide technical assistance, coordination between the Corps and the Tennessee Emergency Management Agency (TEMA), and the well-timed deployment of a Nashville District Liaison to the state Emergency Operation Center, all combined to directly result in the efficient and effective response to all TEMA requests for flood fight assistance throughout the duration of this historic event.

COMMUNICATIONS

The Corps increased the frequency of interagency coordination calls to enable timely, disciplined, and documented contact during a rapidly changing event. Redundant communications systems between responding offices, projects and agencies are vital to an effective response. However, on Sunday, flood waters caused a loss of internet service at the Nashville District headquarters necessitating telephonic communications, slowing information exchange. A lack of common understanding of operations and terminology between the Corps and the National Weather Service impeded our collective ability to coordinate some issues during this dynamic situation. As a result, we are continuing to work closely with our agency partners to improve our interagency

processes and conduct periodic exercises so we are better prepared to act in a synchronized interagency manner. Given the nature of this unprecedented weather event, flooding was unavoidable. A more aggressive interagency effort is needed to educate the public about the risks of flooding as well as where and how to receive information, warnings, and predictions during an event. These are important lessons which the Corps will address, and in fact we are already moving forward to take corrective action.

CONCLUSION

Mr. Chairman, this concludes my remarks. Thank you again for allowing me to testify today. I look forward to answering any questions you or other Members of the Subcommittee may have.