

Complete Text of Commissioner Merritt's Planned Remarks submitted as part of a power point presentation to the fourth and final public hearing along the High Water Inspection during the 393 Session of the Mississippi River Commission aboard Motor Vessel Mississippi at River Mile 230 (Baton Rouge City Dock) on March 27, 2015.

Mississippi River Commission

Public Hearing Comment

by

Hon. Mike Merritt, SLFPA-W Commissioner

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**Aboard Motor Vessel Mississippi
River Mile 230 in Baton Rouge, LA**

March 27, 2015

Good Morning. My name is Mike Merritt.

I was appointed to the SLFPA-W Bank Board of Commissioners because I am an expert on geology and geophysics.

I would like to thank the Mississippi River Commission for this chance to speak on the record.

Respectful Request:

•Please direct staff to field test geophysical methods of testing levee stability.

•Please report cost/benefits of using geophysical tests to assure levee safety and avoid waste.

**Aboard Motor Vessel Mississippi
River Mile 230 in Baton Rouge, LA**

March 27, 2015

I stand before you today to ask for this Commission's consideration in **surveying, studying** and **field testing** the suitability of modern geophysical and earth science methods, such as:

- seismic,
- electromagnetic analysis and
- fundamental physical geology studies,

In order to weigh the potential costs and benefits of applying these methods to assure public safety and avoid waste of resources when building or operating levees.



Southeast Louisiana has been working on flood protection for a while. After the French Quarter was developed with a 3 foot high levee, there were many hurricanes but the worst flood before Katrina was caused by a levee failure.

In 1849 a split in a levee allowed escaping water to drop its sediment near the breach in a geological process, illustrated here by Dr. Nelson's dramatic photograph of an example provided by Katrina.



Photo used by permission for 2015 MRC hearing

Last May 21, I testified to a Louisiana Senate Committee about the principal lesson of the 2005 disasters. The following is an excerpt of that testimony:

“If confirmed to complete my four year term, the next challenge I hope to confront with the help of the Legislature and our stakeholders is to prevent another flood, this time by finding and strengthening any areas of weakness within or underneath the levees.”

Last Time: The Weakest Link



My testimony went on to state in detail this gist of a principal lesson of the 2005 disasters:

Like links in every good log chain, levee reaches in a flood defense system are forged one at a time and some are stronger than others. The whole “chain” of defenses is only as strong as the weakest link.

Next Time: The Next-To-The-Weakest Link

Undetected flaws causing levees to breach, were the Weakest Links in the system, but have now been repaired.



Next, how can stake holders work together to identify and strengthen the Next-To-The-Weakest Links that are now the greatest threat?

We can find anomalies indicating unhealthy levee foundation soils rapidly with relatively inexpensive geophysical surveys.

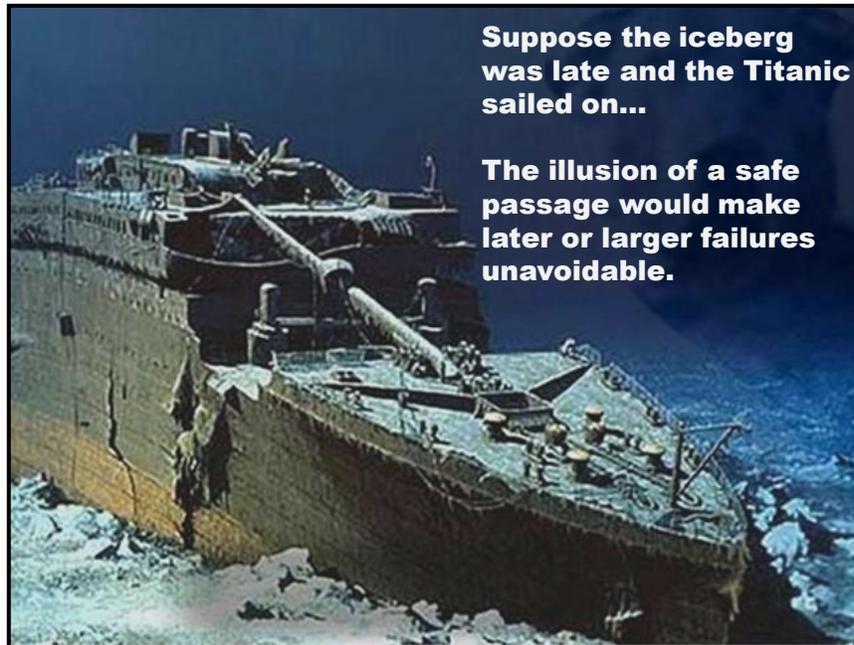
– Mike Merritt

Each additional levee problem indicates a principal, overlooked, lesson of the 1849 levee break disaster is this:

To play offense and prevent levee breaches from happening, instead of waiting to play defense, we must now be concerned with hidden or subtle defects such as the:

“NEXT-TO-THE-WEAKEST-LINKS”;

They are the areas that did not fail previously when the stress on them was relieved in a last urgent moment by failures that did occur at the weakest links.



**Suppose the iceberg
was late and the Titanic
sailed on...**

**The illusion of a safe
passage would make
later or larger failures
unavoidable.**

Titanic the forgotten passengers 10-638 by D Keener published September 10, 2013
<http://www.davidkeener.org/2013/09/titanic-the-forgotten-passengers/>

Suppose the iceberg was late and the Titanic sailed on.

The illusion of a safe passage, in spite of hidden defects, would make later or larger failures unavoidable.

How can we recognize the risk of these hidden defects, these “Next-To-The-Weakest Links” if things appear to be going well?

Geophysical methods, in this case, radar had it been available, would have helped manage risk aboard the Titanic.

Fort Proctor

Built five (5) feet above sea level and 130 feet from shore in 1865.

Foundation is submerged, four (4) feet, and sinking

On weak area easy to detect with geology and geophysics.



[LSU researchers investigate ruins of Fort Proctor | WBRZ News 2 ...www.wbrz.com](http://www.wbrz.com)

What about managing risk on the levees? When things are going well, how can we recognize these long term risks of geologic hazards, these Next-To-The-Weakest links?

In 1865, Fort Proctor was built at Proctor's Landing, near New Orleans, at a site five (5) feet above sea level and 130 feet from water at the shoreline.

In its first five (5) years, this sturdy Fort withstood nine (9) tropical storms or hurricanes and appeared to be a success. However, there were hidden defects and today, the roof is gone and the two story walls stand in water.

Fort Proctor

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On weak area easy to detect with geology and geophysics.



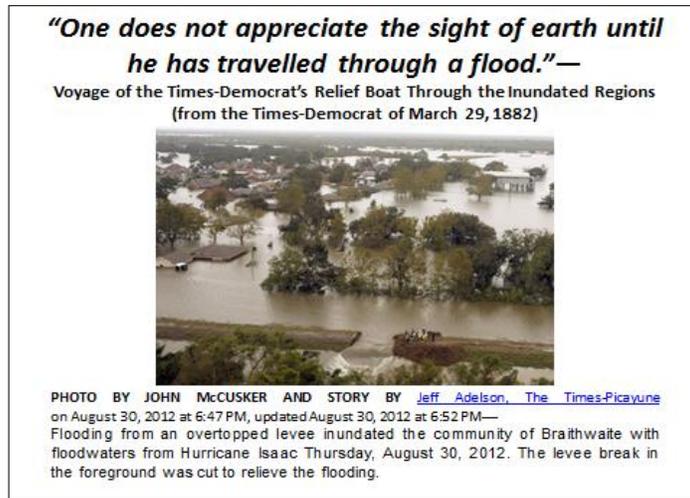
[LSU researchers investigate ruins of Fort Proctor | WBRZ News 2 ...www.wbrz.com](http://www.wbrz.com)

The foundation of the Fort is submerged four (4) feet and sinking due to geologic hazards that could easily be defined by modern geology and geophysics methods.

The “slow motion descent and flooding” of Fort Proctor since 1865 is a warning we may not be aware of future elevation drops along levee rights of way passing over terrain with similar physical geology hazards.

Geophysical tests and detailed physical geology studies will locate and define subtle hazards.

Simple and cheap...



...the riskiest way.

Once, I was advised the simplest and cheapest thing to do, instead of geophysical testing, is just spread uniform layers of clay along levees.

I think this Commission realizes how deceptively dangerous this, without more, would be. It means wasting tax money and resources to overcorrect stable areas while leaving geo-hazard concerns intact or unrecognized.

**Geophysical tests make us safer:
unhealthy levees will be strengthened.**



**This will also help with
levee recertification.**

I urge stakeholders to work smarter to make us safe. Geophysical tests of levee stability will target weak, or unhealthy, areas for improvement.

Also, finding and removing threats will help with levee recertification.

The use of modern geophysical and earth science methods such as seismic, electromagnetic analysis and fundamental physical geology studies would help all of us understand the Next-To-The-Weakest-Link.

Respectful Request:

- Please direct staff to field test geophysical methods of testing levee stability.**

- Please report cost/benefits of using geophysical tests to assure levee safety and avoid waste.**

**Aboard Motor Vessel Mississippi
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Thank you for hearing me.

In closing I respectfully request the Mississippi River Commission carefully consider my remarks and recommendations to survey, study and field test the suitability of modern geophysical and earth science methods, for our levees up and down the Mississippi Valley, to assess their suitability for assuring public safety and avoiding waste.