

# TAKE NOTE

## New Orleans levee performance assessed

Organizational and system issues need urgent attention

—by Joan Buhrman

Nearly six months after Hurricane Katrina's devastation of New Orleans and southern Louisiana, many important questions remain about the performance of the region's hurricane protection systems. Were the levees built as designed, and if so, did they perform as intended in their design; and how big a role did the interaction between the multiple independent local levee districts have on the system's overall performance?

A report by the American Society of Civil Engineers' (ASCE) External Review Panel (ERP) identifies four key areas that require urgent additional attention in the assessment of New Orleans levees.

"We have been, and will continue to provide the Interagency Performance Evaluation Task Force (IPET) with comments, questions, and suggestions based on their methodology, work product and conclusions," said David Daniel, chair of ASCE's review panel. "The ERP feels it has a responsibility to the citizens of New Orleans and the American people to comment on these fundamental issues and encourage their comprehensive assessment."

The first area of concern deals with the lack of organizational responsibility for the entire hurricane protection system—including the region's 350-plus miles of levees. Responsibility for the levees' construction and maintenance falls on multiple local levee districts, and the respon-

*Levees around New Orleans designed to keep water out of the city increased flooding because the massive amount of rain from Hurricane Katrina was too much for the levees to hold back. Electrical outages caused drainage pumps to fail—which would have sent water back into Lake Pontchartrain, the Intracoastal Waterway and the Industrial Canal—so the levees helped retain water in the below-sea-level city.*



### How levees work . . .

Levees are earthen dams, some 50 feet high, constructed to keep water from entering New Orleans. If water does flow over the flood walls, drainage pumping stations pump water back out.



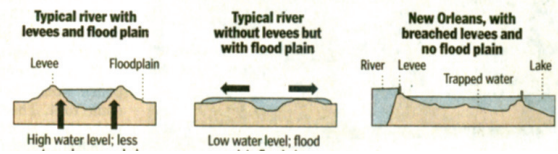
### . . . and fail . . .

In catastrophic occurrences such as Hurricane Katrina, levees may not be tall enough or strong enough to hold back rising water.



### . . . and how they can increase flood damage

Once floodwater enters the city, the levees hold it in, like a big bowl of water. Without levees, high water would normally dissipate over a surrounding flood plain, but because New Orleans is below sea level, the



sibility for the operation and maintenance of the individual pumping stations falls on individual parishes.

The end result is a piecemeal system that can only be as strong as its weakest link. The ERP views any future rebuilding and operation of the levees that does not address this issue as ineffective.

An equally important issue, and one also not addressed in the IPET's scope of work, is the lack of system-oriented strategy for hurricane protection within the region. The current system evolved over several decades as a series of individual pieces joined together in purpose; it is not a robust and resilient integrated system.

A system-wide strategy must provide protection for such critical elements as hospitals, electrical generation facilities,

and emergency shelters. It also needs to incorporate a level of redundancy that could protect the community from complete loss should the levee system fail. The ERP believes the absence of this type of strategy in the current system deserves serious additional consideration.

The panel further identified accommodation for the overtopping of the levees as being fundamental to the security of the system. Once the levees in New Orleans were overtopped, the destruction was catastrophic and the devastation was complete. The ERP feels protection against overtopping must play a major role in the levees' reconstruction, if similar catastrophes are to be prevented in the future.

Lastly, the panel strongly recommends that the approach to protecting the entire region

Source: The Washington Post, August 2005

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— Robert Wick, Thales Navigation

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The Thales GPSDifferential Module is a business partner and software integrator tool that includes MobileMapper Office software for post-processing. When GPSDifferential Module is integrated into a GIS application, raw data collection, functions can be accessed that store data in a separate raw data field which will later be recognized by MobileMapper Office. This affects neither real-time data collection storage nor the structure of the real-time data format. The raw data file stored by GPSDifferential can be post-processed using MobileMapper Office. Post-processed data are exported with

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Software Integrators find that GPSDifferential Module easily merges with their own solutions without the need to change the data structure to support post-processing or create office-based post-processing software.

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MobileMapper CE is a handheld GPS receiver for GIS and many other data collection applications. It sets a new standard for performance and affordability. MobileMapper CE offers an impressive array of high-performance features, including real-time, sub-meter GPS positioning, embedded Microsoft Windows CE.NET, Bluetooth wireless technology, removable SD card memory and an all-day removable battery that make it attractive for a wide variety of demanding GIS data collection and mapping applications.

### About MobileMapper Office

Thales MobileMapper Office is powerful office software that enables viewing, editing and exporting GIS data collected on the MobileMapper CE. MobileMapper Office enables map updates, post processing of GPS data and storage of GIS information for analysis.

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from hurricanes is re-evaluated. The total failure of the hurricane protection system in New Orleans points to a fundamental flaw in its design and construction.

Questions remain about the development of a “standard project hurricane” and its affect on the project’s authorized level of protection; about the incorporation of new knowledge and technology into the design safety review processes over time; about adequate funding being provided to ensure the satisfactory implementation of design standards; and about how loss of life was factored into the decision-making process. There is much to learn from such planning and design questions, and we as a nation—not just the residents of New Orleans—will benefit from further investigation.

For more information on the ERP, or to read the full progress report, visit <https://www.asce.org/static/hurricane/whitehouse.cfm>. Information on the investigation and copies of previous reports and data can be found at <https://ipet.wes.army.mil/>. Final reports from both the IPET and ERP will be issued in June.

*ASCE is widely known for its infrastructure assessments, including Building Performance Assessments of the World Trade Center, Pentagon, and Murrah Federal Building, and its technical assessments following earthquakes, hurricanes and other natural disasters. Founded in 1852, ASCE represents more than 139,000 civil engineers worldwide and is America’s oldest national engineering society.*

