

# New Study of Levees Faults Design and Construction

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NEW ORLEANS, May 21 — Most of the major breaches in the New Orleans levee system during Hurricane Katrina were caused by flaws in design, construction and maintenance — and parts of the system could still be dangerous even after the current round of repairs by the Army Corps of Engineers, according to a long-awaited independent report to be published Monday.

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"People didn't die because the storm was bigger than the system could handle, and people didn't die because the levees were overtopped," said Raymond B. Seed, a professor of engineering at the [University of California](#), Berkeley, and the chief author of the report, in a weekend briefing for reporters here.

"People died because mistakes were made," he said, "and because safety was exchanged for efficiency and reduced cost."

The report differs in significant ways from the findings of the Army Corps' own investigation.

That inquiry will produce its report June 1, but interim findings the corps has issued describe a hurricane protection system that failed in some places because of unanticipated design flaws and in other places was simply overwhelmed.

A corps spokesman, Lt. Col. Stan Heath, said in an e-mail message that "it would be inappropriate for the corps to comment" on the Berkeley-led report since it had not had time to review it thoroughly.

The language of the new report, which was created by a group of three dozen engineers and disaster experts led by a team from Berkeley and was supported by grants from the National Science Foundation, tends toward arcane geotechnical details.

But the message, delivered in some 500 pages, is blistering: The design and construction of the New Orleans hurricane protection system, a project spanning more than 40 years that remains incomplete, was inadequate to protect hundreds of thousands of people in an urban setting.

Dozens of factors contributed to the disaster, the authors state, including political decisions that caused the corps to squeeze miles of floodwalls on too-narrow levees along the city's drainage canals, with sheet piles, the interlocking sheets of steel that anchor the levees, driven to a depth too shallow to block water or the shifting of the mucky New Orleans soil.

All of the factors, they concluded, add up to a culture of inattention that put safety lower on the scale than cost.

The Berkeley study finds fault across the complex web of public and private organizations that should have kept New Orleans safe, from Congress to local levee boards.

"There's plenty of blame to go around," said J. David Rogers, a professor of engineering at the University of Missouri, Rolla, who teaches flood control courses for the corps and is one of the report's authors.

The group recommended extensive changes for the corps, along with a transformation of the nation's approach to flood protection.

The authors applauded the corps' efforts to put in new canal gates, which have taken the riskiest floodwalls in the system out of the front lines, and the use of good construction materials and methods used to rebuild the St. Bernard Parish levees.

But, they warned, the parts of the system with sheet piles that were too short before the storm and which are built on weak soil are still very much at risk in a future storm. Under similar circumstances in another storm, Professor Seed said, "It may still be a very dangerous system."

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