All eyes are on N.O. levees

Despite some improvements, area still vulnerable, experts say

**By AMY WOLD**
Advocate staff writer
Published: May 28, 2006


That might as well be the slogan for the U.S. Army Corps of Engineers’ levee rebuilding effort in southeast Louisiana.

Since receiving federal authorization last year after Hurricane Katrina, the corps’ Task Force Guardian has been repairing levees in the New Orleans area to what they were before Hurricane Katrina. Researchers agree the work is in some cases making the repaired spots stronger than they were before the storm.

But the experts quickly add that doesn’t mean the entire system will indeed be safer. Their descriptions of the current state of the levees range from caution to outright alarm.

“There still will be a lot of miles of system that will be as they were prior to Katrina,” said Ed Link, chairman of the corps’ Interagency Performance Evaluation Task Force.

Some of those areas may have been strained during the storm, and others might face different patterns of force depending how the next storm moves into the area, he said.

“In general, the repairs that have been put in place are significantly stronger than what was there before,” Link said. “(But) if a big storm comes along this hurricane season, those other areas are still vulnerable and people need to get out of harm’s way.”

People need to be aware that a significant part of the system has not been fixed yet, he said.

“Now the rest of the system has to be brought up to the integrity of the repairs,” he said.

Robert Bea, one of the University of California Berkeley researchers looking into the levee failures, agreed.

“I know that’s not very comforting,” he said.

People rebuilding their homes and moving back to the New Orleans area need to be aware of the risks, he said.

“We’re still exposed,” Bea said.
Ivor van Heerden, deputy director of the LSU Hurricane Center and a civil and environmental engineering professor, has an even starker view.

“We’re as vulnerable now as we were before Katrina,” he said. “The only difference is some of the levees have been built stronger than before.”

Drainage canals
Katrina pushed storm surge across Lake Ponchartrain and into three New Orleans drainage canals, the 17th Street, London Avenue and Orleans Avenue canals.

The surge put pressure on “I” wall-design floodwalls that line each side of the canal, but it was the soil under the concrete-topped metal sheet pile that failed.

The canals were meant to drain rain water out of low-lying areas into Lake Pontchartrain.

All 50 or so miles of I-wall floodwalls in the levee system are now suspect, said van Heerden.

“Every one of those is potentially unsafe,” he said.

The corps is building floodgates and pumps at the Lake Ponchartrain edge of the three canals to keep out storm surge.

Two of the gates will not be completed in time for the June 1 start of hurricane season, though they’re scheduled to be ready before mid-June. In the meantime the corps will use sheet pile to close the canal openings if a storm approaches.

“Yes, those floodgates are our biggest challenges,” Col. Lewis Setliff, commander of the corps’ Task Force Guardian rebuilding effort.

When the gates are closed, only a limited amount of rain water can be pumped out of the city, so some areas are expected to flood. The corps is installing pumps to get some water out of the city into Lake Ponchartrain.

The rain flooding problem would be worst at the 17th Street Canal. Existing pumps can put almost 10,000 cubic feet of water per second into the canal. But the new pumps that send the water from the canal to Lake Pontchartrain can move only 1,000 cubic feet per second.

Jim Taylor, a spokesman for Task Force Guardian, said the corps wants to increase that capacity to 6,000 on the 17th Street Canal by mid-summer. The other two canals have much smaller pumps putting water into them, he noted.

The question of pumping capacity concerns van Heerden.
“Until you have 10,000 cfs at the gate, you have potential of flooding from rain, so you need to evacuate early because surface roads will flood,” he said.

A lot of people are living in trailers, which aren’t safe in big storms.

“You’ve got to get the people out earlier,” van Heerden said.

Experts generally agree the pump-and-gate combination should have been installed decades ago.

“The gates, together with the pumps, are absolutely the correct direction to take,” said Bea, the Berkeley researcher.

But questions remain, including how much water the canals can hold before they fail, he added.

The corps and the Orleans Sewage and Water Board — which operates the canals and pumping stations — are working out a plan on managing the canals in a storm, said Col. Richard Waganer, commander of the corps’ New Orleans District.

The temporary solution of using sheet pile to close the canals also raises concerns.

Van Heerden wonders how many times sheet pile can be used without weakening the soils and creating a flooding risk.

“Every time you drive the sheet pile in, you weaken the soil,” he said.

Other hazards — such as mechanical breakdowns or even debris — could keep the gates from closing correctly and again put the floodwalls at risk, he said.

“These are not failsafe systems. You can imagine any number of potential problems,” van Heerden said. “We have to recognize the frailties in this system, and we have to evacuate early.”

**Industrial Canal**

A corps investigation into breaches along Inner Harbor Navigation Canal, commonly called the Industrial Canal, found the floodwalls on the east side failed after water flowed over the top of them and eroded the supporting dirt.

The corps is installing stronger walls along the canal and adding a concrete backsplash on the landward side to prevent erosion. The work will help keep the floodwalls from collapsing — if they failed the way the corps contends.
The Berkeley-led team concluded the water coming over the levee didn’t cause the failure. The collapses occurred when water went under the levee, a problem erosion-control structures won’t solve, said team member Raymond Seed.

Seed said that while the splash pads are “impressive in appearance,” they don’t address the underlying engineering problems.

Seed recently told the state Legislature that sheet piling meant to keep water from traveling underground was “woefully” short all over the protection system.

The corps has declined to comment on the Berkeley-led team’s report until it has time to review it. The corps said it won’t be able to incorporate the information into its levee work before hurricane season, but will evaluate the recommendations for longer-term plans.

**Mr. Go and Pontchartrain**

At one point during Katrina, almost two million cubic feet per second of water flowed over and through the levees along the Mississippi River Gulf Outlet.

“That’s the Mississippi River in a very, very big flood,” van Heerden said. “MRGO is a very efficient conduit for water.”

The corps built the 76-mile long MRGO in the 1960s to provide a shorter route between the Gulf of Mexico and New Orleans.

During Katrina, water from Lake Borgne overtopped some spots of the dirt levees and poured through breaches, filled up a marsh area and then overwhelmed a levee designed to protect communities in St. Bernard Parish.

Van Heerden said that by the time the water started coming into the “bowl” between the MRGO levee and the parish levee — but before the levees were overtopped — waves had broken the MRGO levees. Before the water rose high enough to top that first line of defense, water was already pouring into the wetlands between the MRGO levee and the parish levee.

What happened there could just as easily happen on the south shore of Lake Pontchartrain, he said.

The corps is rebuilding the MRGO levees with stronger soils. But van Heerden said the levees could fail again because the underlying, foundation soil is sandy. Sandy soil could allow the levee structure to slide landward during a storm, he said.

Another concern is the lack of any hard structure to cover dirt levees to help prevent the wave damage seen during Katrina, he said.

“Those are brand new levees,” he said.
That means the dirt levees don’t even have a grass covering to help protect against waves, he said. Asphalt, rock or other hard materials would work, he said.

“Armoring is something that’s critical,” van Heerden said. “Ideally, we’d like to see the entire MRGO levee armored.”

If a storm comes through that puts 10 feet water into Lake Borgne, problems could recur.

“We could potentially chew those levees up very quickly,” van Heerden said.

Bea agreed, saying that even though the MRGO levees are being built with better clays and other material, they’re still vulnerable.

“Those levees still remain unarmored,” Bea said.

The corps has funding to armor some spots, such as areas near flood-control structures in the MRGO levee. Those “transition” areas were scoured out during the hurricane and needed to be rebuilt. The corps has asked Congress for money to armor more of the levee system.

The corps’ Setliff concedes St. Bernard Parish would flood this year if hit by a hurricane as strong as Katrina. Katrina overwhelmed the system in many spots, and the authorized design height hasn’t changed for most areas, he said.

### Future work

Some levees in the New Orleans area didn’t fail during Katrina, but could during the next storm.

Breaches in some spots relieved stress on others that were damaged and close to failing, van Heerden said.

“The critical thing is for any levee section, as soon as you get a failure it takes the pressure off the adjacent walls,” van Heerden said.

The corps is conducting a survey of levees that didn’t fail outright and will use it to prioritize future repairs, said Jerry Colletti, operations manager for completed works with the corps.

The inspection is focusing on the strength and height of the levees, he said. Any found to be below authorized height will be raised by September 2007, he said.

While the corps says “pre-Katrina” protection will be in place by June 1, finishing work will continue through the summer, Setliff said.

Some levee sections will still need to be raised above authorized levels to account for future subsidence, or the gradual sinking of the ground. Subsidence caused many levees
to be much lower during Katrina than when they were built, lessening the protection they provided.

Also, grass will be planted in some spots to help protect levees against waves. Along MRGO, getting grass to grow can be complicated — freshwater isn’t readily available, so contractors are barging it in for planted areas.

In the meantime, people living in southeast Louisiana are waiting to see what this hurricane season brings.

“I think folks had more confidence in the hurricane system pre-Katrina in part because it had never been tested,” Link said. “You get lulled into a false sense of security.”

Construction of that system started 40 years ago, after Hurricane Betsy, which may seem like a long time for humans, he said.

“Forty years on Mother Nature’s scale is kind of just a drop in the bucket,” Link said.

Setliff said the repair work should be substantially completed by June 1 and many of the levee systems will be stronger than they were before Katrina.

“I’m very confident that our repairs are better and stronger,” Setliff said.

That doesn’t mean work on the levees is finished.

“Guardian’s work is just one step,” Setliff said.