

## **How Schools Can Become More Disaster Resistant<sup>1</sup>**

During Hurricane Andrew, Florida schools were blown to pieces. During the Northridge Earthquake, California schools were damaged. And after the Red River flooded in the spring of 1997, North Dakota and Minnesota schools were inundated by mud and made uninhabitable. Federal, state and local governments have spent millions repairing or replacing schools after disasters. Further, students have been left anxious, uprooted, out of classrooms for long periods of time or relocated to other facilities - disrupting their education and increasing their stress. And no state, no location, no school district is invulnerable.

As gloomy as this picture is, there is much that can be done by school officials to plan for disaster, to mitigate the risk, to protect the safety of students and educators, and to ensure that schools recover quickly. The key, though, is timing. While the Federal Emergency Management Agency stands ready to mobilize when necessary to help communities pick up the pieces and recover, it's preferable to expend energy BEFORE the disaster. FEMA cannot undo the damage of an earthquake on an unprepared school or push back the clock after a flood has swept away a child's school year. Under its new Project Impact initiative, FEMA is encouraging city officials, businesses, schools, residents and others within communities to work together before disaster strikes. Prevention is always the best disaster action.

"The Northridge earthquake really motivated us and had a positive effect of raising awareness about the need for community preparedness," said Peter Anderson, director of emergency services for the Los Angeles Unified School District. "It raised awareness on the part of the teachers and the staff that we have to be prepared - not because it's mandated, but because it's real."

Many states now require specific disaster preparedness activities in their school systems. In California, for example, schools are required to have a disaster plan, to hold periodic drop, cover and hold drills and to hold educational and training programs for students and staff. In Kentucky, a 1992 bill mandated disaster plans, drills and training in the schools. Disaster drills in schools are required in Oregon, Montana and Missouri, and Idaho and Arkansas mandate earthquake resistant design for all public buildings, including schools.

In support of the growing awareness of the need for disaster preparedness in schools, FEMA offers a course several times each year at our Emergency Management Institute in Emmitsburg, Maryland. Called the Multi-Hazard Safety Program for Schools, the week-long course outlines a specific plan of action for all schools. As discussed in this class, FEMA recommends the following actions for all school officials:

Identify hazards likely to happen to your schools

---

<sup>1</sup> The article was published in the \* and has been included at the suggestion of Pamela Dalton-Arlotti.

Mitigate against the hazards

Develop a response plan, including evacuation route

Plan for coping after a disaster

Implement drills and family education

## **Hazard Identification**

When beginning your disaster preparedness planning and hazard assessment it's important to realize that past experience shows that most people will survive even the worst disaster. Most of the injuries and deaths related to natural disasters are caused by falling objects, fires, the release of hazardous materials, flying debris and roof collapse. Be sure, then, to look for such hazards when doing your assessment.

Begin with a determination of which natural and technological disasters are possible in your area. For help, visit the FEMA Web site at [www.fema.gov](http://www.fema.gov) or contact your state or local emergency management office. Don't assume you know all the risks. You may be surprised to learn that your area is subject to natural disasters you hadn't anticipated. For example, earthquake risk is not restricted to the Pacific Coast. Such states as New York also are at some risk. The New Madrid fault affects such states as Kentucky and Missouri. Also, remember that disasters can have a cascading effect - forest fires can bring mudslides; earthquakes cause fires, tornadoes cause downed power lines. Think about how transportation routes or other external factors may also affect your schools: Are you near a major highway where hazardous chemicals are transported, putting your school in danger of a chemical spill?

Once you find out what disasters are possible in your area, assess your structures. If you are in a wildfire area - do you have bushes trimmed back from the buildings and non-flammable roofs? If you are located in a hurricane-prone area, do you have the roof securely attached using hurricane straps. And if you are in earthquake areas, have you walked through the schools to ensure that bookcases and heavy appliances are securely bolted to the walls? Fluorescent lights not properly secured fell on students during the 1983 Coalinga, CA, earthquake. Libraries are particularly hazardous areas since unsecured bookshelves are extremely dangerous for both students and staff. Science classrooms and custodian closets are another intrinsically dangerous area, where hazardous chemicals on open shelves can break or fall during a tornado or earthquake, causing toxic fumes and compounding a disaster. During the Coalinga earthquake, chemicals burned through two floors of a high school.

Conduct your survey in a systematic manner, making an inventory of all items that require attention. It may be possible to enlist volunteers from among your parents or emergency management community. This is no paper exercise. You and your staff must personally walk the halls and classrooms to determine what risks exist. Peter Anderson, of the Los Angeles Unified School District, saw many of his schools severely damaged by the Northridge Earthquake. He said the principal and plant manager of each of his schools walk together through every classroom at the beginning of the school year, with checklist in hand. Hazards are corrected immediately. He also noted that before a

disaster, schools should document their property, something which can be done as part of the hazard assessment. Schools that took photos and videos prior were far ahead in recovery with less hassle and more quickly restored than the schools where files were missing and records were not kept," he said.

### **Mitigate Against Hazards**

Based on your assessment and using information on mitigation from the FEMA Web site, it's best to prioritize your needed mitigation measures by degree of life safety, cost, frequency of identified potential hazard and potential number of people exposed. Unfortunately, it's unlikely that you will have the unlimited resources necessary to make all mitigation measures that you might like, but many important measures are reasonably priced for the protection they offer - a good cost/benefit ratio. Many measures are simply common sense and will cost almost nothing - like moving chemicals to lower shelves or placing electronic equipment and computers on higher floors if you have a flood risk. Some examples of inexpensive mitigation measures include using lockdown devices or threaded washers and nuts to strap computers down in earthquake prone areas. Approved storage cabinets for hazardous materials cost about \$500 and shatter resistant plastic film covering glass cases cost \$2 to 7\$ per square foot. Some schools have a bucket in each classroom, stenciled with the room number, that include immediate first aid and rescue tools. Higher ticket items such as strapping buildings to foundations and installing hurricane straps should be seen as a long-term investment in the safety of your students.

Anderson reiterated that his Los Angeles Unified School District schools must look at disaster preparedness and mitigation as important as the traditional reading, writing and 'rithmetic - regardless of tight school budgets.

"You can't teach in an unsafe, potentially dangerous situation. If you aren't taking steps for mitigating you are morally and legally at fault," he said. "If you're not prepared to expect the unexpected, you're rolling the dice."

In the New Hanover school district in North Carolina, where Hurricane Fran closed schools for seven days, mitigation efforts in the future may even include moving some schools that are in particularly risky locations, said Harris McIntyre, the district's director of Education, Training and Safety.

### **Developing A Response Plan**

It is important to remember that while your focus is planning how to safeguard your school and students during and immediately following a natural disaster, your plan must incorporate the larger issues that will be facing the community at such times. For example, any large disaster will result in widespread telephone outages, damage to roads and bridges, loss or damage of utility systems, fires, release of hazardous materials and possibly flash flooding relating to dam damage or damage to sewer and water systems.

Even medium-sized disasters will quickly push your community's normal emergency response forces to the limits. During the 1987 Whittier Narrows earthquake, which was only moderate in size, all of the Los Angeles fire department's ambulances and half of its fire engines were committed within the first 40 minutes. Citizens,

businesses and others had to depend on their own resources for hours and days. School disaster plans must take this into account with the goal of being able to survive on your own - food, water and power - for 72 hours after a catastrophic disaster.

It's important to have a school-based emergency plan that includes an incident commander, search and rescue team, hazardous materials, security, utilities, assembly area, first aide, reunion gate for students and fire suppression team. FEMA also recommends keeping good records and logs before and after a disaster and to keep a tab on money spent for supplies and equipment damaged to make it easier for schools to receive reimbursements they might be entitled to.

It's important that your plan address safe evacuation routes, keeping in mind your potential hazards, including the location of gas and power lines, chain link fences, transportation routes of vehicles carrying hazardous material, clay or slate tiles on the roof etc. Obviously, select an evacuation route that minimizes exposure to hazards, and have a back-up route in case of debris. The advantage of using the same evacuation route for a fire is that it is easier for students and staff to remember; the disadvantage is that different disasters may block evacuation routes in different ways.

Your plan should also address the needs of students and staff with disabilities and the possibility of debris covering the floor. Consider keeping a push broom in every room with mobility impaired people or consider having a buddy system to assist persons with disabilities. Be sure to practice this during disaster drills. Also consider evacuation plans for any animals that may live at the school, including those in science classrooms. They should be evacuated as well since it is often impossible to know how long you will need to be away from the school. Your local humane society or animal welfare organization can assist with animal disaster planning.

Your disaster planning should also include an onsite shelter because disasters may occur that require you to keep students overnight. Your plan should focus on such issues as where students will sleep and which rooms are the safest. It's important each school has sufficient supplies for use during an emergency, including: food, blankets, stored water, flashlights with batteries, first aid kits, blankets, battery-powered radio and other supplies.

Each school should develop plans that include teaching students and staff what to do during disasters that are likely to occur in their area - whether those occur while they are at school or at home. Schools in earthquake risk areas should teach drop, cover and hold to their students. Even kindergartners can understand the importance of getting under a desk or table and covering their head if the earth starts shaking. Children in tornado country should know to get away from windows. Teachers can incorporate disaster preparedness into lessons of science, geography, art and reading and other subjects. The FEMA for Kids Web site ([www.fema.gov/kids](http://www.fema.gov/kids)) includes curriculum that teachers can use, as well as stories, activities and games to make disaster preparedness appealing to youngsters.

Jim Miller, superintendent of the Wishkah Valley school district in Washington State, said his teachers are instructing students to deal with the aftermath of disaster, not

just the immediate occurrence. "We want them to understand what to do later," he said. "How to prepare for the aftershocks, for example. You don't just flip a button and go back to normal."

Schools also need to plan ahead to determine when and whether they will release students. Children should not be let out to wait for the bus during lightning storms, for example. During heavy rain with flashflood watches or warning, schools should have written guidelines about the release of students. School buses can be swept away by as little as 6 inches of water, thus releasing students may put them at greater risk than keeping them in the safety of your buildings. School staff can monitor weather conditions better if each school has a NOAA weather radio, which costs only about \$30 or \$40.

Superintendent Jim Miller attended FEMA's Multi-Hazard Safety Program for Schools in 1996. Upon his return from Washington, he immediately formed committees to address the preparedness and mitigation issues raised in the course. One of their first innovations was changing their drills by putting up barriers to test new routes for students. They also halted their original use of codes to describe various emergency situations in the school, on FEMA's advice. In reality, Miller said, the codes can be confusing to staff, who forget what they refer to, and are confusing to substitute teachers. Instead, they now are honest when there is a situation at the school, such as an intruder.

Miller said his long-term disaster planning will focus on both volcanoes - Mount St. Helens is nearby - and earthquakes.

"It's inevitable that we're going to have an earthquake," he said. "If it happens, you're going to wish you had a plan in place."

Miller emphasized the importance of bringing parents into the planning process. They will feel more comfortable if they know you have a plan and understand how it works. It's also important for them to understand such emergency actions you may take, such as restricting to whom students are released and where following a disaster. Reminders should be sent out at the beginning of each school year. Parents with special skills may also be recruited as emergency volunteers - particularly if they live within walking distance. Parents who are doctors, nurses, telecommunications experts, machinists or electricians may be particularly helpful. And don't forget to also include members of your surrounding community. Schools don't exist in a vacuum, and during a disaster, they may be looked upon as a vital recovery element by the community. Your plan should take into account this possibility.

After a disaster, your school may serve as the gathering place for hundreds of people who live or work nearby. Your plan should address how school personnel are released and in what order. Some staff, for example, may live nearby and may be able to stay while others have small children and will need to get home in the case of an emergency. All staff, however, must have back-up family plans in case they cannot return home or must remain at the school following a major disaster. This responsibility to students in a disaster should be covered in each individual's contract.

While planning can be an overwhelming process, it may help to sketch out a

chronology of what to do immediately following a disaster. Often the first decision will be to evacuate or to stay put. Your plan will address both options. Your plan must then address what actions to take if there are people who will remain in the buildings. Damage must be assessed and damaged portions of the building sealed off. Injured students and staff must be attended to. All people in the buildings must be accounted for and searches initiated for the missing. Small fires must be extinguished and utilities assessed and shut off, if necessary. Hazardous spills must be contained and sealed off. And, of course, students need to be kept calm and reassured. Staff must be responsible for establishing contact with the outside and for handling media questions. Someone - the principal or designee, should be identified as the Incident Commander and in charge of the disaster scene. Individual schools may use the term campus commander to differentiate from the top school district level incident commander.

### **Coping After A Disaster**

Psychological trauma after a disaster is very real. Reactions of children to disaster are affected by five factors: their perception of the adult's reaction; the direct exposure they've had to the destruction; child's developmental age; existence of problems prior to the event; prior experience in another disaster. It is important that schools plan ahead of time to deal with the inevitable psychological aftermath. The FEMA for Kids Web Page includes information for teachers on identifying at-risk children and for conducting classroom exercises that help students voice their fears and overcome them.

Identifying at-risk students is one of the most important things your staff can do after a disaster. Signs to look for include withdrawn/quiet students, those acting overly responsible or parental, hyperactive children with little focus, children who are edgy, jumpy or quick to anger, vying for attention, out of control or with an attitude of non-caring. Work done after the Loma Prieta Earthquake, which struck Northern California in 1989, is helpful for schools developing such aftermath plans. Classroom exercises that can help include discussions of the disaster, temporarily reducing academic performance expectations, encouraging involvement in school recovery efforts and resuming social activities. Student artwork and essays can be posted on the FEMA for Kids Web site. Information on how to do this is found on the FEMA Web site.

Planning for a future disaster may seem overwhelming - and it is difficult. But it is not impossible and by using the resources of FEMA and those within your local communities and within your school districts, you can all be better prepared. Finally, it's important to realize that even if disaster strikes, your community will recover. It's an important lesson to remember. Even communities as hard hit as those hit by spring floods in 1997 are coming back. As Kaitlan Deikson, of Manvel School, in North Dakota, writes: It all started when my mom woke me up and said we have to evacuate. So I got dressed and brushed my teeth and packed my stuff. We were ready to go. Then we drove to Manvel to stay with my grandparents. So here I am at Manvel School. I like it. It is kind of fun being at a new school. There are many new kids and lots of other new people. Everyone here has been very nice. Everything is OK. The flood is going away and soon we'll be back home. But this will be my new school for the rest of second grade.

### **Sidebar:**

FEMA offers a one-week course, Multi-Hazard Safety Program for Schools, which is designed to help the school community plan for all types of disasters. Topics include risk reduction techniques, drills, immediate response exercises, post-disaster recovery and mitigation opportunities, school violence and crisis counseling. In addition to this course, FEMA offers an Earthquake Safety Program for Schools course that is intended to help the school community prepare to be self-sufficient in the aftermath of a destructive earthquake. FEMA also offers K-12 hands-on workshops that introduce earthquake-related topics to teachers who train others in their school districts. For more information about FEMA's school program, contact Dawn Warehime at (301) 447-1309 or [dwarehime@FEMA.gov](mailto:dwarehime@FEMA.gov).