TORNADO!
LIGHTNING!
FIRE!
I

t’s often in the news: pictures of horrific destruction due to fire and natural disasters, stories of heroic teachers, scenes of heart-wrenching personal loss. While some may have experienced such challenges firsthand, most of us only see these disasters on TV, hoping that it doesn’t happen at our school. As school administrators, faculty, and staff, we are tasked with the responsibility of providing the safest environment possible for the precious gifts entrusted to us—our students, as well as for everyone else on our campuses. It would be a violation of that trust not to do all we can to actively prepare for the risks our schools face.

Recent site surveys and inspections of our schools by Adventist Risk Management reveal that while many of them have outstanding prevention and loss-control programs, others are deficient, particularly when the administrators are new or inexperienced. Thus, it is well to revisit some of these important precautions on a regular basis.

While schools face more than their share of potential emergencies, this article will focus on the most common concerns, weather-related risks and fire risks.

Regardless of how many types of disaster potential a school may face, each risk needs specific, careful planning and prevention. To ensure prudent management of such risk, questions that must drive the planning include the following:

• Will evacuation be required? What is the safest path for each student group at any given time in the school day? What are the potential dangers that will shape decisions about whether evacuation is necessary?
• Is it feasible to use the school building(s) for shelter in place? Which types of emergencies will require shelter in place, and where are the most effective locations?
• Will there be enough advanced warning to close schools and send children home? How effective is our system for communicating with parents/guardians and students? Has a common, off-campus site been determined for safe rejoining of parents with students?
• What steps do we need to take to ensure effective and prompt action in case of an emergency?

To assist schools with answering these and other crucial questions and in developing an effective emergency plan, the Federal Emergency Management Agency (FEMA), working closely with the U.S. Department of Education and other key agencies, released the Guide for Developing High-Quality School Emergency Operations Plans in 2013. Each school is urged to download this comprehensive resource and follow its steps in establishing a campus emergency plan. This guide covers, in detail, Prevention, Protection, Mitigation, Response, and Recovery. Of particular im-

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importance are the Planning Principles that help create the necessary philosophical foundation for complete buy-in and cooperation from all school, church, and conference entities. This guide was prepared for United States public schools, but the principles are easily adaptable to all Seventh-day Adventist schools, both in the U.S. and internationally.

Our discussion in this article will not attempt to summarize or duplicate all of the information in the above Guide; instead, we will focus on areas of neglect and poor management that have been observed by ARM staff during on-site inspections.

Your local fire department or the Red Cross can help you determine what type of supplies should be maintained and the appropriate quantity, based on the size of the school.

PLANNING FOR WEATHER EMERGENCIES BEFORE THE STORM

The Plan
Written action plans for all potential school emergencies will become the blueprint for action before, during, and after an event. The Guide for Developing High-Quality School Emergency Operations Plans, noted above, outlines specific steps for establishing an effective plan. In order to create a workable plan, careful thought and attention are critical. The plan need not be complex, but it must be effective and comprehensive, addressing all potential risks. Developing an emergency action plan always requires a team effort—a team with diverse experience and skills, including school administration, teachers, maintenance staff, food-service personnel and other staff members, including those who deal with transportation and medical needs. It is wise to include parents and older students in developing the plan. Interaction with local emergency responders, such as police, Emergency Medical Technicians, and fire departments, is also necessary. If your school is small and has minimal staff, you will need to seek more assistance from parents and local emergency providers. While public emergency response personnel will generally only offer advice, the in-house team should be assigned specific responsibilities based on their areas of expertise. The written plan is the cornerstone of an effective safety program and is required by most state and federal regulations. It should be reviewed and updated yearly, and be made available to all employees.

Drills
For many emergencies, drills are a critical component of an effective safety plan. Some emergencies listed in the plan will not require a whole-school drill, but can be satisfied with tabletop drills and discussions that identify everyone’s responsibilities. Drills regarding intruders and shooters should be handled very carefully so as not to traumatize younger students.

Tornadoes and fires, on the other hand, will require drills that involve teachers, staff, and students. Tornado drills are required by some states, although the number of drills varies. Fire drills are required by all states, and some require tornado and other weather-related drills. Follow local requirements for drill frequency.

Emergency Supplies
All emergency plans need to include designated areas where supplies are maintained for the school personnel and students. Many schools purchase or rent large metal overseas shipping containers that they position outdoors in a secure area as an emergency bunker. Your local fire department or the Red Cross can help you determine what type of supplies should be maintained and the appropriate quantity, based on the size of the school. Typical emergency supplies include the following: long-life emergency food and water, first-aid supplies, safety clothing and equipment, portable lighting with a supply of fresh batteries, and thermal blankets and/or rain gear. These supplies should be restocked after each emergency and updated at the start of each school year.

Preventive Maintenance
In emergency planning, a frequently overlooked area is preventative maintenance. In a storm-related emergency, staff and student safety will depend upon the integrity of the classrooms, the tornado shelter, or other school buildings. A properly designed and well-maintained facility will fare much better in a storm, particularly where strong winds and heavy rains are prevalent. ARM inspections have revealed that the items listed below are commonly overlooked:

• Poorly maintained gutters that become damaged or filled with leaves. These allow water to overflow or back
up, causing damage to roofs, walls, and even building interiors. Failure in this regard is frequently evident during risk-control surveys and is sometimes so severe that vegetation is actually growing in gutters.

• Damaged or loose roofing materials and siding are vulnerable to further damage and even total loss when battered by powerful winds. This may produce emergency conditions and require evacuations that might not have been necessary if the buildings had been properly maintained.

• Although a powerful storm can knock down healthy trees, there is higher risk of injuries or property damage from falling unhealthy trees and dead limbs. Arborists or tree surgeons can identify potential problem trees and dangerous limbs that should be removed.

• Lightning arrestors should be in place and working properly.

Geographic location is obviously a major factor when preparing for weather-related risks. Such disasters can include tornadoes, high winds, hurricanes, freezing rain with subsequent ice build-up, lightning storms, blizzards, floods, extreme cold or heat, and more. The extent of damage on an institution from weather-related emergencies will depend primarily on the factors listed below.

Hazard Identification

Accurate identification of potential hazards will include a survey of the history of weather-related incidents in your geographical area. A great resource for understanding weather patterns, which will also provide general weather information for both staff and students is the National Oceanic and Atmospheric Administration (NOAA). This interactive site is a comprehensive resource for all weather-related information, including storm tracking, forecasting, severe events, local information, and much more. Designated school staff and administration should monitor this site, not only for the protection of the school, but also as a resource for student projects.

It is important for administrators and staff to understand the potential...
weather hazards that might affect the school. Each type of storm has particular elements of concern. Some weather situations allow for ample decision-making time, others provide little if any warning.

On each campus, select staff to be trained in weather basics. Even a superficial understanding of storm prediction can ensure better warning time for approaching storms. A weather radio should be monitored as well as local TV, radio, and weather-related Websites. While weather prediction is not an exact science, it is always better to be prepared. Identifying the potential for weather-related emergencies is a vital element in the prevention and limitation of storm-related losses.

WEATHER RISKS

Tornadoes
According to the NOAA, a “tornado watch” may go into effect with adequate lead time for safety precautions to be taken for students, even as a storm approaches. But the typical “tornado warning” provides only 13 minutes to take action. Tornado watches and warnings should never be ignored. For schools in areas prone to tornadoes, plans need to include identification of safe zones. In addition, planning should address:

- Student/parent/guardian notification procedures;
- Communication methods in the event of power outages (air horns, megaphones, etc.);
- First-aid supplies;
- Methods for transporting of students and/or staff with disabilities;
- Provisions for holding children after hours, as they generally will be safer in buildings than on roadways in vehicles;
- Readily accessible documentation regarding the authorized release of children to parents or guardians;
- The holding of drills based on the school’s safety plan;
WhenEVER thunderstorms and lightning approach, halt all outdoor activities and move everyone indoors. Lightning can strike randomly, so precautions should be taken when skies look threatening. Establish appropriate protocols and signals to immediately call everyone indoors. Also, ensure that important electronic devices are connected to surge-protection devices or unplugged because electrical surges can destroy both hardware and data.

**Flooding**

Major storms (e.g., severe thunderstorms, tornadoes, hurricanes and/or typhoons, tsunamis, and sudden winter snow or ice melt) all can create large amounts of rainfall, storm surges, or sudden flash flooding. Identify the potential flooding hazard for your location. Remember, flooding can occur days after the storm has ended as the runoff water breaches the banks of creeks, streams, rivers, lakes, dams, levées, and ocean/sea coastlines.

Preparation should include:
- Identification of the potential flooding hazard for your location.

Schools in coastal areas need to determine the potential damage that could be caused by a storm surge. This information can be found on flood maps and flood plain charts, which are readily available from the library, weather service office, or FEMA. Schools located in the United States can determine their flood risk potential by using this online tool: [https://www.floodsmart.gov/floodsmart/pages/flooding_flood_risks/defining_flood_risks.jsp](https://www.floodsmart.gov/floodsmart/pages/flooding_flood_risks/defining_flood_risks.jsp)

**Winter Storms**

Like hurricanes, winter storms usually can be predicted far enough in advance to allow adequate time for implementation of safety plans. Preparation should include the following:
- Plans for a modified class schedule, late starts, or cancellation of classes. Modification of class schedules will only be as effective as the communication process with students and parents/guardians.
- Thermostats may need to be reset to higher temperatures in buildings, particularly at night, to prevent pipes from freezing. (Frozen pipes and the resulting damages are one of the largest claims received by Adventist Risk Management.)
- Provision for removal of snow and ice, including clearing of roofs where heavy snowpack can cause collapse. Schools can contract for these types of services.
- Emergency lighting, generators, and other sources of power in the event of an ice storm, which can cause power outages, sometimes for a week or more.
- Plans and procedures for preventing slips and falls, such as warning signs for wet floors and non-slip rugs for entranceways, along with quick cleanup of wet, slippery areas where rain and snow are tracked into buildings.
- Accessible battery-operated walkie-talkies, fresh batteries, solar chargers for cell phones (recently much less expensive) and, of course, emergency provisions—blankets, food, and first-aid supplies.

**Storm Shelter Areas**

Designated locations within the school need to be identified as storm shelter areas. Typically, these include basement areas, interior hallways, and restrooms on the lowest floor level without or away from windows. Administrators should work closely with local emergency responders, building contractors, or a licensed structural engineer to identify the safest shelter areas on campus and to determine the number of persons who can be sheltered in each area. Signage should then be installed directing people to these areas within the various buildings.

**Hurricanes**

Because hurricanes are tracked for days, there will usually be adequate warning of their severity, time of arrival, and areas at risk. This will make it possible to proactively prepare for these storms. Both Web resources mentioned above address issues relating to hurricane preparedness. Remember that consistent monitoring of weather reports on TV and Websites is necessary to ensure adequate preparedness.

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• Careful monitoring of NOAA weather radio or TV stations for potential flood alerts or flash flood warnings;
• An evacuation plan that can be immediately implemented if flooding is occurring in your area, which should include the location of safe zones on higher ground;
• Common-sense measures to ensure the safety of students and staff;
• Avoid all contact with flood water, as it may be contaminated with sewage.
• Do not allow students or adults to walk, swim, or drive through flood waters. Remember, just six inches of fast-flowing water can knock a person down, and two feet of water can float a vehicle.

FIRE

Emergency planning for storms and fire emergencies are similar, but there are some major differences. Storms fit into the category of “natural disasters” for which weather is the cause. Forest fires and lightning are also a part of this category because the greatest cause of forest fires is lightning. While forest fires sometimes threaten homes and schools, most structure fires are caused by non-natural forces. They are not limited by location, occur more frequently, and are in many cases preventable. The FEMA table below lists some fire statistics for just one year, 2012.

We will focus here on non-residential structure fire safety in the United States, where nearly a hundred thousand non-residential fires occur annually. Fires can happen anywhere, anytime, and generally without warning. Most structure fires are restricted to one building. Of note is the number of deaths in residential fires versus non-residential fires. This is due in most part to the extra warning in non-residential buildings from fire alarms as well as the use of sprinkler systems. Worldwide, few homes have fire sprinkler systems, and while some homes today have a fire/smoke alarm installed, many do not operate properly, generally because of failure to check the battery, which is often dead or missing.

• After flooding occurs, do not use gas or electric appliances until they have been checked for safety.
• Turn off the power and water main valve if instructed to do so by the local authorities.
• Stay out of any flooded buildings until they have been declared safe for re-entry by the local authorities.
• During clean-up, always wear protective clothing and safety gear—e.g., gloves, eye protection, and masks and/or respirators. A best practice is to use a licensed professional restoration contractor for this type of work.

Electrically Caused Fire Hazards

The largest cause of fires in non-residential buildings is electrical. This includes:
• The improper use of extension cords. Multi-head extension cords should never be plugged into a power strip or other multi-head extension cord. Most household extension cords can handle only light electrical loads.
• Old and inadequate wiring. As wiring ages, oxidation can occur, along with the loosening of electrical connections. In some areas, copper wiring was replaced with aluminum wiring, which is more prone to oxidation and resulting fires. All aluminum wiring should be replaced with copper.
• Space heaters that don’t turn off automatically when tipped over. (New models are equipped with switches that turn off the heater if it tips over.) However, a heater can easily be set too close to a flammable surface or tip without the shut-off switch tripping, causing a fire. Allow for a three-foot clearance around all portable heaters, and do not use them when flammable liquids or fumes are present.
• Electrical cords that are routed under rugs, carpets, or desk chair floor mats. Their insulation can become worn, creating the potential for short circuits and fire.
• Multiport electric plug adaptors. These should be replaced with power strips containing a built-in breaker.
• Overloaded electrical cords. Do not plug a power strip into another power strip or extension cord. Too many devices plugged into extension cords or power strips can cause a circuit to overload when the wires overheat. Over time, this will break down the wire’s insulation and start a fire.
• Excessive power drain on outlets. If the breakers on power strips trip repeatedly, the power usage is too great, and fewer devices should be plugged into them. High-voltage devices such as heaters, large lighting fixtures, and blow dryers, etc. can quickly overtax a power strip.

Continued on page 28
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Ready to take action when the alarm sounds.

Being prepared requires planning, training, and practice to save lives in an emergency. Are you ready?

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**Other Hazards**

Other practices that should be avoided: the improper storage of flammable liquids, use of mechanical rooms as storage closets, and displays of holiday decorations and student projects that are not fire rated or treated with a fire retardant. We have seen many schools and churches cover entire walls with flammable paper. These walls are simply torches ready to ignite. Always use fire-rated paper, and observe local codes regarding the percentage of wall space that can be covered with any paper (usually 20 percent). Ensure also that upholstered furniture and drapes are treated with fire retardant. (This does not purport to be a comprehensive list of hazards, but does include some of the most common problems that we have seen during ARM school inspections.)

**Fire Emergency Planning**

There are three main activities in the planning process for fire emergencies:

1. The writing and annual review of the fire emergency section of your school’s Emergency Action Plan. As in the weather-related section of the Emergency Action Plan, this should list emergency procedures related to fire prevention and safety. Details specific to each building should be listed on the building’s emergency evacuation diagram.

2. Annual building inspections, with particular attention given to potential fire hazards. Building inspections may not sound like planning, but they represent a vital part of the process. Identifying and eliminating hazards is critically important. Included in the inspection is ensuring that all fire and smoke detectors and other alarm systems are in working order. The appropriate type of fire extinguishers must be mounted properly and serviced annually. Special attention should be given to lighted exit signage, emergency lighting, and evacuation route maps. Problems identified during the inspection should be corrected as quickly as possible. Annual building inspections are essential in identifying unique building features that require special attention during a fire, and are a necessary part of creating an effective plan. Specific self-inspection forms are available on the Adventist Risk Management Website for churches, schools, and camps. The forms also deal with various safety issues in addition to fire.

3. Practice your plan to make sure that it works. Important components of a successful drill are as follows:
   a. **Frequency.** How often drills are conducted is usually regulated by the local jurisdiction. In Florida, for instance, the requirement for K-12 schools is 10 drills per year, with two during the first two weeks of school. At the higher education level, only one drill per academic term is required.
   b. **Alarm system.** Not all alarms sound alike, and when activated, may not be recognized by someone who has not rehearsed the drill. Verify that the alarms can be heard everywhere in the building, including remote storage areas and bathrooms. Antiquated systems will need to be updated. (Many older alarms are “local only,” meaning that they do not alert the fire department or someone in another building or off site who is responsible to call the fire department. Also, newer fire alarms include a flashing light that alerts the hearing impaired of the fire alarm or other danger.) Make sure all fire alarm systems automatically notify the fire department. We often hear people say that “our policy is to call the fire department after we have determined that it is not a drill or false alarm.” But when the building is
empty at night, the alarm may not be heard for some time.

c. Drills should be performed as though there is a real fire. All emergency exits should be used. Every occupant, including students, teachers, staff, guests, and administrators, should leave the building and meet at the designated assembly area. The point of a fire drill is to get everyone out safely and quickly. Teachers should check to be sure that each student (as well as classroom aides and visitors) has arrived at the assembly area. This will enable the person in charge to give an accurate report to firefighters. During an actual fire, if someone is unaccounted for, it is the job of the firefighters to search for missing persons.

d. The designated assembly area should be at least 200 feet from the building being evacuated to give the fire department sufficient room to operate safely. Do not block streets or roads that are necessary for fire department access. Remember, when selecting an assembly area, that in the case of a real fire you and your students could be there for an extended period of time. It could be raining and/or very cold or hot, so plan for shelter if needed.

e. After the drill, solicit feedback. Find out what worked smoothly and what didn’t. Revise your plan as needed. Be sure to review how long it took for everyone to evacuate. If there is a concern that everyone did not evacuate the building, the structure can be searched, but only after the drill has been officially concluded.

f. You should also make sure that all fire alarm systems functioned properly and notified the fire department.

Conclusion

An important part of our work as administrators, teachers, and staff is to reduce the potential for losses of life, property, and resources. Taking appropriate preventative measures is not an option, it is a requirement. Averting a disaster is the goal. But even if a major disaster occurs after the best prepara-

tion, there is some consolation in knowing that we did our very best. We are called to be faithful stewards of the resources entrusted to us, especially the lives of God’s precious children—our students and staff.

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Additional Resources

• At Adventist Risk Management, Inc., “Our ministry is to protect your ministry.” Extensive risk control resources are available on our Website to help with all aspects of risk management. They are free and can be accessed at http://www.adventistrisk.org.

• Prevention Web, Serving the information needs of the disaster reduction community: http://www.preventionweb.net/english/countries/statistics/?cid=185


• American Red Cross, “Plan and Prepare”: http://www.redcross.org/prepare


REFERENCES