AUBURN UNIVERSITY
SEVERE WEATHER PLAN

April 2007

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I. INTRODUCTION

The purpose of this Severe Weather Plan is to provide a course of action to be used during a severe weather event to minimize the potential for injury and loss of life that can result during a tornado. This plan also identifies the most tornado-resistant areas in your building. These areas are not necessarily to be considered tornado safe; but, in our judgment, they are the "best available" for locating people during tornado warnings. This plan should be reviewed at least annually by all employees in your area to ensure that everyone knows where the severe weather shelter area is and what to do when the severe weather siren activates. Tornadoes develop from high winds associated with thunderstorm activity or in conjunction with hurricanes. Typically spring and late summer thru early fall seasons provide the best conditions conducive to tornado formation, although, a tornado can form during any season.

II. SEVERE WEATHER ALERTS

The National Weather Service has defined four severe weather alerts that are of concern. The actions recommended are intended to be the minimum responses necessary for this severe weather plan.

A. SEVERE THUNDERSTORM WATCH

A severe thunderstorm watch means weather conditions are such that a severe thunderstorm could develop, but has not at this time. This alert usually lasts for five or six (5 or 6) hours.

B. SEVERE THUNDERSTORM WARNING

A severe thunderstorm warning means a severe thunderstorm has developed and will probably affect those areas stated in the alert message.

C. TORNADO WATCH

A tornado watch means weather conditions are such that a tornado could develop, but has not at this time. This alert usually lasts for five or six (5 or 6) hours.

D. TORNADO WARNING

A tornado warning means a tornado has formed and was indicated by weather radar or sighted, and may affect those areas stated in the alert. This alert usually lasts for one (1) hour.

III. THUNDERSTORMS

Thunderstorms may develop at any time of the year. Although thunderstorms can occur during any month, the more violent storms occur in the spring and summer months. Thunderstorms can be single cell, multicell cluster, multicell line, and super cell. Supercells always form severe thunderstorms. Thunderstorms typically consist of very high winds, rain, lightning, and in many cases hail. Typically the larger the hail is, the stronger the thunderstorm is. Hail ¾ inch in diameter or more with winds in excess of 55 mph indicate a severe thunderstorm where tornados are likely to be spawned. Tornado formation is most likely to occur where the hail falls. Another dangerous aspect of a thunderstorm is lightning. The best protection from lightning is to seek shelter in a nearby building. Flooding can also occur in low areas and in areas where storm drains are blocked. It is also no surprise that severe thunderstorms can produce damaging winds with or without forming tornados.

IV. ANATOMY OF A TORNADO

Tornadoes form under a certain set of weather conditions in which three very different types of air come together in a certain way. Near the ground lies a layer of warm and humid air along with strong south winds. Colder air and strong west or southwest winds lie in the upper atmosphere. Temperature and moisture differences between the surface and the upper levels create what is called instability, while the change in wind with height is known as wind shear. This shear is linked to the eventual development of rotation from which a tornado may form.

A third layer of very warm dry air becomes established between the warm moist air at low levels and the cool dry air aloft. This very warm layer acts as a cap and allows the atmosphere to warm further making the air even more unstable. Things start to happen when a storm system aloft moves east and begins to lift the various layers. Through this lifting process the cap is removed thereby setting the stage for explosive thunderstorm development as strong updrafts develop. Complex interactions between the updraft and the surrounding winds, both at storm level and near the surface, may cause the updraft to begin rotating and a tornado is born.

A tornado is a violently rotating column of air in contact with the ground with speeds of 60-300 mph. It is only visible due to water droplets mixed with dust and debris. Doppler radar will not "see" tornados. The radar only detects precipitation and light rain in the center of heavy rain indicates tornado potential. Contrary to popular belief, tornados do not leave the ground, only the intensity changes and they appear to "jump". Tornados can be categorized into three groups based on the "Fujita" scale.

- **Weak** - 80% of all tornados, 60-110 mph winds, path 3 miles long lasting 1-10 minutes. Cause less than 5% of all deaths.

- **Strong** - 19% of all tornados, 110-205 mph winds, path less than 5 miles, lasting 10-20 minutes. Cause 30% of all deaths,

- **Violent** - 1% of all tornados, winds greater than 205 mph, can have a 50 mile path lasting up to 60 minutes. Cause 70% of all deaths.

The most common direction of a tornado path is from the southwest to the northeast but they can come from any direction. Tornadoes are most likely to occur during the afternoon and evening. The most violent storms occur in March, April, May, November and December. The peak hours are from 12:00 noon until 7:00 P.M.

V. EFFECTS OF HIGH WINDS

The causes of damage to buildings by a tornado may be classified in one of three categories which include: extreme winds, missiles, collapse. All buildings have at lease one undesirable structural feature relating to the effects of a tornado. Examples are: large areas of glass, long roof/ceiling spans, wind tunnels, and load-bearing wall construction. The areas designated in this report are not to be considered "tornado-proof", but rather the best available areas for sheltering during tornado and severe thunderstorm warnings.

Shelter areas were selected by Risk Management & Safety personnel in conjunction with Lee County Emergency Management Agency. As much as possible, the shelters were selected to:

A. Avoid glass

B. Avoid interior and exterior doors

C. Utilize interior spaces with short spans

D . Keep occupants as far away as possible from entrances

E. Avoid areas expected to become wind tunnels

F. Distribute locations throughout the building to facilitate rapid access

G. Avoid areas where chemicals are stored

H. Put as many walls as possible between you and the exterior of the building

VI. EMERGENCY NOTIFICATION SYSTEM

Severe weather alerts are transmitted by two means: via pole-mounted sirens stationed at five specific locations around the campus and via severe weather radios located within campus buildings. The sirens and radios are tested audibly on the 4th Wednesday of the month at noon (this will not occur if it is storming to prevent confusion). Defective radios should be immediately reported to Risk Management & Safety for repair or replacement.

Watches and warnings are broadcast via the severe weather radios. Minimum actions that should be taken based on specific alerts are detailed in the next section.

Sirens will not sound for a tornado watch, only for a tornado warning which means one has been sighted in our area. The sirens will activate for three minutes when a tornado has been sighted.

VII. MINIMUM ACTIONS TO BE TAKEN BASED ON SPECIFIC SEVERE WEATHER ALERTS

A. SEVERE THUNDERSTORM WATCH

Be aware that conditions may be ripe for the development of a tornado.

B. SEVERE THUNDERSTORM WARNING

Review your severe weather action plan. Usual activities can continue but be prepared to seek shelter. Avoid going outside if possible.

C. TORNADO WATCH

Review your severe weather action plan. Usual activities can continue but be prepared to seek shelter.

D. TORNADO WARNING

When a tornado warning is issued, activating the sirens and broadcasting a tornado warning via the severe weather radios, **all supervisors and instructors shall immediately lead their employees and students to their building's designated shelter area.** Persons responsible for severe weather radios in the building should unplug them and take them to the shelter area to monitor for additional warnings. **All persons located outdoors shall seek shelter indoors immediately.**

Exterior doors should not be opened. Under no circumstances should persons leave buildings during a warning. During a warning, persons should take one of two positions -- The preferred position is kneeling with their head between their knees facing the wall, and the other is, seated on the floor with their backs to the wall. In either case, they should be as low as possible to reduce their potential for injuries from flying missiles or glass or debris. If available, some form of covering should be used to protect heads, arms, and legs.

The warnings will last for an hour from the last siren unless a shorter time is indicated by the National Weather Service. Building occupants should remain in the shelter area for at least that long unless a new warning is issued and the sirens

activate again, or the National Weather Service issues a release. **Listen to your radio for information.**

Remember, you typically have only three minutes to reach a shelter so **do not delay**. Waiting can mean the difference between life and death. Everyone must be familiar with the location of the severe weather shelter area(s) in their buildings and should be briefed on what actions to take when the sirens have sounded. Persons in the shelter should tune to local radio stations, their severe weather radio, and/or a NOAA weather radio for additional information.

VIII. SEVERE WEATHER KIT

Every building will have at least one Severe Weather Kit. Some buildings will have more than one. The kit should include at least the following items:

- Flashlight(s), with extra batteries
- Battery-operated Radio, with extra batteries
- NOAA Weather Radio if available
- First-aid Kit
- An A-B-C-type fire extinguisher
- Several Blankets

IX. UNIVERSITY CLOSURE

The decision to close the University ultimately lies with the President. When time and circumstances permit, decisions on University closure will be made by the President, Executive Vice-President and Provost under close consultation with Risk Management & Safety and Auburn Public Safety. Risk Management & Safety monitors weather conditions on an ongoing basis, and maintains close communication with the Lee County EMA and other agencies with information on potential emergency situations. Others may be consulted as needed to make an informed decision. The decision to close the University will be communicated to the campus community as quickly and with as much advance notice as possible. When time permits, classes may be canceled in advance of full University closure, to allow a more organized closure and reduce the impact on traffic in and around campus.

X. FLOOR PLAN & SHELTER AREA IDENTIFICATION

Floor plans and location of the shelter area for your building are on file with the Department of Risk Management and Safety.

XI. MEASURES TO BE TAKEN WHEN USING A SHELTER AREA

A. All doors around shelter areas should be closed and secured during a tornado warning.

B. Window and doors with glass panels should be avoided because of potential missiles propelled by high wind.

C. Chemicals and cleaning supplies should be removed from areas designated for shelter use and relocated to a non shelter area.

XII. ADDITIONAL RESOURCES

The Tornado Project Online
One of the most informative web sites regarding tornado facts and statistics
www.tornadoproject.com/index.html

The National Weather Association, Tornados Fact Sheet
http://www.crh.noaa.gov/lmk/preparedness/tornado_large/

NOAA National Severe Storms Laboratory
www.nssl.noaa.gov/

Weather for Auburn
www.weather.com/outlook/homeandgarden/schoolday/local/USAL0036?from=search_current

The National Weather Service
Current and Forecasted Weather Conditions, Hazardous Weather Outlook and Other Resources
http://www.weather.gov

Red Cross Tornado Safety
http://www.redcross.org/static/file_cont244_lang0_114.pdf

Storm Encyclopedia
www.weather.com/encyclopedia/tornado/form.html

The Weather Channel – Tornado Information
www.weather.com/safeside/tornado/