# State Working Group
# On Domestic Preparedness
# Ad Hoc Committee on

# University and College Campus Emergency Notification Systems Report


**Submitted July 6, 2007**

# State Working Group on Domestic Preparedness Ad Hoc Committee on University and College Campus Emergency Notification Systems Report

# State Working Group on Domestic Preparedness Ad Hoc Committee on University and College Campus Emergency Notification Systems Executive Summary

Within the Gubernatorial Task Force for University Campus Safety report is a recommendation for Emergency Notifications Systems for universities and colleges in Florida. http://www.dcf.state.fl.us/campusSecurity/finalReport.shtml

The Gubernatorial Task Force recommends:

"That Florida's Domestic Security State Working Group articulate standards for Emergency Notification Systems and devices within 45 days of the submission of this report and provide that information to the State University System, the Division of Community College and the Association of Independent Colleges and Universities of Florida. The Working Group should also promulgate a "best practice" guide for the use, maintenance, and frequency of testing of such a system." (Page 8)

**The State Working Group Ad Hoc Committee on University Campus Emergency Notifications Systems recommendations:**

1. Standards: These standards are designed to address the charge given to the committee. However, the Committee would prefer that these be seen as best practices due to the inherent differences between the various universities and colleges, the complexity of the necessary technology systems, and potential costs to the institutions and to the State of Florida. The standards incorporated herein should be considered provisional until actual practices have been implemented for one year with feedback provided to the State Working Group. Necessary funding should be provided to meet all of the standards and recommendations set forth in this report.

    a. Urgent communications should be communicated within ten minutes to90% of the affected campus(es); Moderate communications in under two hours to 90% of the impacted campus(es); Non-urgent communications within two days. These articulating standards should be field tested for at least one year prior to confirming these three categories for adoption.

    b. Use, maintenance and testing: Bi-annual exercise of emergency notification systems should be conducted on all university/college campus(es). At least one of these tests must include an exercise of at least the fire alarm system(s). System testing should occur during the fall or spring semester when most students are on campus to participate in the drill.

    c. The basic level of emergency notification systems or strategy that would be engaged at any college or university should consider the following technology now available: an outdoor audible device, weather radio, text messaging system and internal mass telephone notification system.

    d. Due to the compact time provided for this committee report, additional work will be needed in order to solidify the technical standards, develop implementation standards, and review the budgetary impact and feasibility of the standards set forth in this report.

2. Additional Recommendations: These recommendations are intended to support and enhance the standards listed above.

   a. The Regional Domestic Security Task Force K-20 Committee should establish a permanent subcommittee charged with the development of complete technical standards for emergency notification systems for the State University System, the Division of Community College and the Association of Independent Colleges and Universities of Florida. This committee should be comprised of membership representatives of the universities and colleges.

   b. Universities/colleges should perform a communications infrastructure assessment of its emergency notification system at least every two years. This assessment should include, at a minimum, those communications devices or system in use at the institution: such as telephone, internet technology (IT) networks, wireless internet technology networks, power, broadcast (FM) radio, public safety radio, campus television, in house audio/video systems, intercom, internal mass telephone notification system, text messaging, website, variable message signs and outdoor signaling devices (audible). Each university/college should design an emergency notifications system(s) for their campus(es) that would be National Incident Management System compliant and that would include appropriate parties, including parents and visitors to the campus.

   c. The Domestic Security State Working Group University and Community College Emergency Notification Committee should work with the Florida Department of Management Services, Division of Enterprise Information Technology Service to establish state purchasing contracts for emergency notification equipment and systems, with comments available to the institutions. These contracts should be written to be available to any state university/college, state or local agency.

   d. Governor Crist should make a formal request of President Bush and Florida's Congressional leadership to expand the scope of the Warning Alert Response Network Act to facilitate the development of national standards for emergency notification systems for universities and community colleges or create a separate act. The request should also express the need for special grant funding to facilitate the build-out of these systems across our nation's universities and community colleges. Letters of support should be obtained from Florida's Board of Governors and the Council of Presidents, Association of Independent Colleges and Universities, and any other interested parties.

   e. Universities/colleges should familiarize themselves with the "Final Report of Phase 1 of Emergency Communication Systems (EmergComm) Program for Florida University and Community College Campuses" completed in 2006 by the University of Central Florida (UCF). It is available on the web via a link from the UCF website at http://ec.creol.ucf.edu/. In addition, there is a test bed that has been established at UCF that is available to appropriate personnel from all Florida universities and community colleges to view, test, and evaluate the technologies represented in the test bed. The contact for the test bed is Dr. Lei Wei [407-823-5098; lei@eecs.ucf.edu].

   f. Each institution should develop operational procedures to implement an Emergency Notification System.

   g. Further study should be conducted to determine if a recommendation can be developed for a system wide standard for Emergency Notifications System and coordination with facility design for new construction. The tasks proposed by the University of Central Florida (UCF)

to the Gubernatorial Task Force are a good starting point for such studies (see task force report).

h. Determine the feasibility and issues in sending emergency notifications to Direct Service Organizations on campus, parents, areas around campus and campus members in route to campus.

As identified in the University of Central Florida's report on "Emergency Communications Systems for Florida University and Community College Campuses." *"It is very difficult to have a single design for an all-hazards alert system on a dynamic campus environment."* Consequently, each university and college campus must select technology and procedures that are a best practice for that institution. No one set of standards or one best practice can be identified for the diversity of Florida's colleges at this time.

Table 1. Emergency Alert/Communications Scenario Matrix
(Examples are provided for consideration in the table)

This matrix is intended to identify the major categories, or scenarios, for emergency events requiring notification of, alert to, and communication with some targeted portion of the population on a university or college campus. The specifics of events that fit each scenario should be developed as part of the communications portion of each institution's Emergency Operations Plan (EOP).

| | Time available to notify | | |
|---|---|---|---|
| Geography or size of alert group | Urgent, Immediate (≤10 min) | Moderate Time (<2 hr) | Non-urgent (> 2 Hours) |
| A. Campus wide | Event 1 (Tornado, Active Shooter, Hazardous materials) | Event 4 (Clery[1] Timely Warning) | Event 7 (Hurricane) |
| B. Several to many selected locations and/or groups | Event 2 (Fire, Hostage) | Event 5 (Bomb Threat) | Event 8 (Flood) |
| C. Few (1-3) locations and/or groups | Event 3 (Active Shooter, Medical, On campus death) | Event 6 (Utility outage) | Event 9 (Anticipated Civil Unrest, Special sporting event) |

[1] The **Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act** is the landmark federal law, originally known as the Campus Security Act that requires colleges and universities across the United States to disclose information about crime on and around their campuses.

**Urgent, Immediate:** These incidents require immediate warning. Example listed – Tornado: The institution is aware of a tornado warning and further information that suggest the campus is in the path of the tornado. The warning provides not more than a 10 minute notice of the event.

**Moderate**: These incidents pose a threat to the campus either where the college has just discovered the incident after the fact or where the incident allows more time for consideration of factors that may affect the campus. Example - Clery Time Warning: A serious crime has occurred on campus and the suspect(s) are apprehended and no longer pose a known threat to campus safety but the investigation is ongoing and may develop other risk issues.

**Non-urgent**: These incidents are known in advance and there is time for planning and preparation. Example – Hurricane: In this event the crisis can be anticipated and there is enough time for planning and mitigation of the hurricane. (Event 7)

# State Working Group on Domestic Preparedness Ad Hoc Committee on University and College Campus Emergency Notification Systems Committee Report

A. Summary:

On April 30, 2007 Governor Charlie Crist issued Executive Order 07-78 establishing a Gubernatorial Task Force for University Campus Safety. On May 24, 2007 the Gubernatorial Task Force for University Campus Safety issued its "Report on Findings and Recommendation."

Within the Gubernatorial Task Force for University Campus Safety report is a recommendation for Emergency Notifications Systems for universities and colleges in Florida. http://www.dcf.state.fl.us/campusSecurity/finalReport.shtml

> The Gubernatorial Task Force recommends:
>
> "That Florida's Domestic Security State Working Group articulate standards for Emergency Notification Systems and devices within 45 days of the submission of this report and provide that information to the State University System, the Division of Community College and the Association of Independent Colleges and Universities of Florida. The Working Group should also promulgate a "best practice" guide for the use, maintenance, and frequency of testing of such a system." (Page 8)

A national recommendation has been made by the "Report to the President – On Issues Raised by the Virginia Tech Tragedy". (Page 17) http://www.hhs.gov/vtreport.pdf

> "Develop a clear communications plan and tools to communicate rapidly with students and parents to alert them when an emergency occurs. Utilize technology to improve notification, communications, and security systems."

The Ad-Hoc committee held its inaugural meeting on June 5, 2007 and selected Daryl Johnston, Santa Fe Community College, as the chair and Victor Cullars, Florida Department of Law Enforcement, as the co-chair of the committee. Subsequent weekly meetings and conference calls were scheduled to complete the assigned tasks.

During its research, the committee reviewed the work previously done by university research staff, information provided by industry professionals, current legislation, applicable rules, regulations and standards that affect or may impact the standards set forth in this document. **This document is not intended to be an exhaustive set of technical specifications for emergency notification systems.** It is intended to serve as a guide to the State University System, the Division of Community Colleges and the Association of Independent Colleges and Universities of Florida (hereinafter titled University/Colleges) in selecting the technologies that will help them meet their emergency notification needs. To establish complete technical specifications for each of the technologies requires much more time than is allocated for the development of this report.

This Committee has focused on the Gubernatorial Task Force recommendation as the committee's charge. However, the committee was aware of the additional recommendations made in the Task Force report (the "Report") about Emergency Notification System's funding, awareness campaign, and distribution to local emergency responders.

The Report also includes three additional recommendations (pages 8 and 9) regarding campus Emergency Notifications Systems that will not be addressed in this report except as a recommendation for additional assignment to this Committee at a later date.

The Committee has searched for levels of crisis in the university/college environment that could require the need for an Emergency Notification System (ENS). Dr. Eugene Zdziarski, a noted scholar in the area of crisis management, lists three levels of crisis for universities and colleges in a matrix he developed in *Campus Crisis Management* (Zdziarski 2007). (Federal Emergency Management Agency Levels are suggested and may vary depending on the specific Emergency Notification System requirements.)

The Federal Emergency Management Agency provides five levels of crisis incidents in the *ICS-200 Basic ICS, Single Resource and Initial Action Incident*, document (page 2-20). The five levels start with Type 1 incident which is the most complex, with high impact on local jurisdictions, moving to the lowest Type 5 incident which represents a local emergency with the need for limited resources. http://training.fema.gov/EMIWeb/IS/is200.asp

1. Disaster FEMA Incident Levels 1-3
2. Campus Emergency FEMA Incident Level 4
3. Critical Incident FEMA Incident Level 5

The Committee reflected on these categories of crisis in a campus environment and developed a matrix addressing crisis levels, with best practices in consideration of criticality and campus design.

**NOTE: The use of technology for notification is dependent upon the recipient to accept or react to that technology. Example: If a text message is sent out as part of an emergency message, this requires the user to have their phone on (or able to receive emergency message) and to open the text message and read the message. This is one reason why multiple methods of notification are desired.**

B. Committee Recommendations:

1. Standards: These standards are designed to address the charge given to the committee. However, the Committee would prefer that these be seen as best practices due to the inherent differences between the various universities and colleges, the complexity of the necessary technology systems, and potential costs to the institutions and to the State of Florida. The standards incorporated herein should be considered provisional until actual practices have been implemented for one year with feedback provided to the State Working Group. Necessary funding should be provided to meet all of the standards and recommendations set forth in this report.

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c. The basic level of emergency notification systems or strategy that would be engaged at any college or university should consider the following technology now available: an outdoor audible device, weather radio, text messaging system and internal mass telephone notification system.

d. Due to the compact time provided for this committee report, additional work will be needed in order to solidify the technical standards, develop implementation standards, and review the budgetary impact and feasibility of the standards set forth in this report.

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b. Universities/colleges should perform a communications infrastructure assessment of emergency notification system at least every two years. This assessment should include, at a minimum, those communications devices or system in use at the institution such as: telephone, internet technology (IT) networks, wireless internet technology networks, power, broadcast (FM) radio, public safety radio, campus television, in house audio/video systems, intercom, internal mass telephone notification system, text messaging, web site, variable message signs and outdoor signaling devices (audible). Each university/college should design an emergency notifications system(s) for their campuses that would be National Incident Management System (NIMS) compliant and that would include appropriate parties, including parents.

c. The Domestic Security State Working Group University and Community College Emergency Notification Committee should work with the Florida Department of Management Services, Division of Enterprise Information Technology Service to establish state purchasing contracts for emergency notification equipment and systems, with comments available to the institutions. These contracts should be written to be available to any state university/college, state or local agency.

d. Governor Crist should make a formal request of President Bush and Florida's Congressional leadership to expand the scope of the Warning, Alert, Response Notification (WARN) Act to facilitate the development of national standards for emergency notification systems for universities and community colleges or create a separate act. The request should also express the need for special grant funding to facilitate the build-out of these systems across our nation's universities and community colleges. Letters of support should be obtained from Florida's Board of Governors and the Council of Presidents, Association of Independent Colleges and Universities, and any other interested parties.

e. Universities/colleges should familiarize themselves with the "Final Report of Phase 1 of Emergency Communication Systems (EmergComm) Program for Florida University and Community College Campuses" completed in 2006 by the University of Central Florida. It is available on the web via a link from the UCF website at http://ec.creol.ucf.edu/. In addition, there is a test bed that has been established at UCF that is available to appropriate personnel from all Florida universities and community colleges to view, test, and evaluate the

technologies represented in the test bed. The contact for the test bed is Dr. Lei Wei [407-823-5098; lei@eecs.ucf.edu].

f. Each institution should develop operational procedures to implement an Emergency Notification System.

g. Further study should be conducted to determine if a recommendation can be developed for a system-wide standard for Emergency Notifications System and coordination with facility design for new construction.

As identified in the University of Central Florida's report on "Emergency Communications Systems for Florida University and Community College Campuses." *"It is very difficult to have a single design for an all-hazards alert system on a dynamic campus environment."* Consequently, each university and college campus must select technology and procedures that are a best practice for that institution. No one set of standards or one best practice can be identified for the diversity of Florida's colleges at this time.

C. Background on Florida University/Campus Emergency Notification System:

In 2005, the State Working Group Education Committee, chaired by Julie Collins, recommended to the SWG that funding should be provided for a research and equipment grant to allow universities/college in Florida to seek a best practice for an Emergency Notification System. Funding was provided in 2006 to the University of Central Florida for a study of emergency notification issues and technology which included three state universities. The executive summary of the recommendations and finding of this grant can be found at:
http://www.dcf.state.fl.us/campusSecurity/docs/ExecSummaryEMERGCOMFinalReport051807.pdf

Below is a problem statement by the University of Central Florida from the Executive Summary of their study:

> "Three important criteria are relevant to campus alert/notification systems: (1) provide an alert to the campus population as quickly as possible; (2) alert and inform the campus population in multiple areas with different instructions that could change rapidly; (3) provide at least a means of basic communications under extreme situations such as a power outage and/or downed telephone service. These criteria must also consider the limitations of the disabled."

The research component of the University of Central Florida was limited by the design of the grant. However, several important findings are offered on university/campus by the University of Central Florida's report on EMERGENCY NOTIFICATION SYSTEM:

1. Three key requirements for an alert system:
   a. Alert as many people and as quickly as possible in a normal condition.
   b. Alert as many people and as quickly as possible without power and phone service.
   c. Constantly deliver alerts to specific groups of people in different locations.

2. It is very difficult to have a single design for an all-hazard alert system on a dynamic campus environment. We highlight a few survey results here and discuss their consequences.
   a. Fifty percent of students and faculty will not immediately pick up a ringing phone. This indicates that an internal mass notification system type of service will have limited effectiveness for notifying students and faculty.

b. Ninety-five percent of those surveyed prefer to be notified by mobile (cell) phones. This shows the importance of collecting a mobile (cell) phone database, however, cell phone reception could be limited in lecture rooms and in buildings that block radio signals due to their construction. Furthermore, before starting the lecture, faculty often ask students to turn off their cell phones.
c. Ninety-five percent of survey respondents do not know the difference in meaning between an alternating steady siren and wail siren tones. This indicates that a siren may be good for general alert, but not effective to carry a precise message. It is important not to rely on a siren alone, but rather combine it with other alert methods.
d. Most of the students frequently check email, but faculty does not. This shows that email is a good way to alert students, but not faculty.

D. Terminologies and Definitions:

1. Emergency Notification Systems: Any communications system utilized to effectively communicate, notify and/or convey information to the impacted population.

2. Device: Any piece attached to the system used to transmit or receive any information.

3. Campus Community: The campus community is not limited to university students, faculty and staff who routinely occupy university buildings and traverse campus. The campus community also includes visitors to the university such as potential students, construction workers, vendors, etc., and entities which occupy land and buildings not directly controlled by the university but are considered to be on campus. Any university/college Emergency Notification System design should include notification of these entities, where feasible.

E. Applicable Rules and Regulations:

1. Radio frequency (RF) devices utilized in emergency notification systems, as well as the system in its entirety, must conform to all applicable Federal Communications Commission (FCC) Rules and Regulations (Title 47), state statutes, county/city ordinances, Commission of Accreditation Law Enforcement Agency (CALEA) standards and International Association of Campus Law Enforcement Administrators (IACLEA) standards.

2. The operation of all devices utilized in emergency notification systems as well as the system in its entirety must be operated according to all applicable Federal Communications Commission Rules and Regulations, state statutes, county/city ordinances, Commission of Accreditation Law Enforcement Agency (CALEA) standards and International Association of Campus Law Enforcement Administrators (ICALEA) standards.

3. National Incident Management System Alert does not allow the use of codes, e.g. 10-4 in a message. Please use plain speech and avoid abbreviations where feasible. (NIMS Alert 023-06)

F. Emergency Notification System Design Consideration:

In order to identify the requirements for an emergency alert and communications system for a university/college campus, there are several factors that must be considered. These include the following:

1. Portion of the population and number of locations/groups that are to receive a particular alert. For example, must everyone on the campus be alerted, or only certain groups, or people in certain buildings or locations.

2. Time in which the alert must be delivered. For example, for an active shooter or hazardous material release or explosion, the alert needs to be delivered in as short a time as possible, within 10 minutes. However, for a hurricane, the warning is typically several days in advance of the event. Refer to Table 1.

3. Level of detail or amount of information that is needed to be delivered by a specific alert. For example, a siren can only mean "pay attention", whereas a phone or text message can deliver specific information about the emergency and what action is to be taken by the recipient.

4. Size of the population that must be alerted, and how they are distributed among the facilities on the campus. For a few hundred people, there are many options. For many thousands, the above factors must all be considered.

The problem is thus multi-dimensional, and the available or practical solutions will depend strongly on the nature of the campus as well as the nature of the emergency.

To assess the options, the following tables are provided to define the interplay of the above parameters and present several categories or scenarios to be considered in designing a system for a particular institution or campus. **As previous studies have concluded, it is not possible to have a single design that will meet the needs of all institutions and campuses. Each university or college must define their needs, priorities, and options and select the technologies and system design that best meets their needs.**

G. Matrixes for Campus Emergency Notification System:

1. Time/geography:

Table 1. Emergency Alert/Communications Scenario Matrix
(Examples are provided for consideration in the table)

This matrix is intended to identify the major categories, or scenarios, for emergency events requiring notification of, alert to, and communication with targeted portions of the population on a university or college campus. The specifics of events that fit each scenario should be developed as part of the communications portion of each institution's Emergency Operations Plan (EOP).

(Table 1 listed on next page)

| | Time available to notify | | |
|---|---|---|---|
| Geography or size of alert group | Urgent, Immediate (≤10 min) | Moderate Time (<2 hr) | Non-urgent (> 2 Hours) |
| A. Campus wide | Event 1 (Tornado, Active Shooter, Hazard materials) | Event 4 (Clery Timely Warning) | Event 7 (Hurricane) |
| B. Several to many selected locations and/or groups | Event 2 (Fire, Hostage) | Event 5 (Bomb Threat) | Event 8 (Flood) |
| C. Few (1-3) locations and/or groups | Event 3 (Active Shooter, Medical, On campus death) | Event 6 (Utility outage) | Event 9 (Anticipated Civil Unrest, Special sporting event) |

**Urgent, Immediate**: These incidents require immediate warning. Example listed – Tornado: The institution is aware of a tornado warning and further information that suggest the campus is in the path of the tornado. The warning provides not more than 10 minute notice of the event.

**Moderate:** These incidents pose a threat to the campus either where the college has just discovered the incident after the fact or where the incident allows more time for consideration of factors that may affect the campus. Example - Clery Time Warning: In this example a serious crime has occurred on campus and the suspect(s) are apprehended and no longer pose a known threat to campus safety but the investigation is ongoing and may develop other risk issues.

**Non-urgent**: These incidents are known in advance and there is time for planning and preparation. Example – Hurricane: In this event the crisis can be anticipated and there is enough time for planning and mitigation of the hurricane. (Event 7)

Geographical

A. This level indicates that the entire campus community may reasonably be at risk, therefore immediate notification is suggested.

B. This level indicates that selected areas of campus are at risk. Example – Fire: A fire is in progress at a main campus building which required evacuation of the building. However, due to smoke, other buildings close by are impacted and the safety of occupants of these building(s) is a concern.

C. This level indicates that only a small or discreet section of the campus is impacted where notification is needed. Example - Death on campus. A campus member is found dead of

an apparent natural cause in their office. Out of respect for the campus member, notification should be made to those closest to the event or those who will be impacted by the death.

**NOTE: Requirements for event notification can change as that event evolves.**

2. Technology:

For each scenario there are specific technologies or combinations of technologies that are applicable. The selection will depend on several factors, including cost, level of information that is needed in the communication (see below), the size of the population that must receive the alert/communication, and the concentration and size of the facilities on the campus where the alert/communication is to occur (see below).

The key questions to be addressed in identifying the potential technologies applicable to each scenario include the following:

a. What technologies, or combinations of technologies, are applicable to each scenario?
b. What information is needed to specify the technology and system capabilities?
c. What are the limitations of each technology or combination of technologies for each scenario?
d. What types of crises or events are assumed to be in each scenario?

Once the scenarios applicable to the institution or campus needs are defined, the required level of information communicated in the alert needs to be defined and compared to the capabilities of a particular technology or system design. The matrix in Table 2 below is intended to identify the most likely level of alert information that will be needed for each of the scenarios in Table 1.

**NOTE: These examples are only for illustration purposes.**

Table 2. Desired level of information and detail in alert/communication for the nine scenarios in Table 1

| | Level of information – amount of detail in the alert and communication | | |
|---|---|---|---|
| Event numbers (Table 1) | High | Medium | Low |
| 1 | | X | X |
| 2 | | X | X |
| 3 | X | X | X |
| 4 | X | X | |
| 5 | X | X | |
| 6 | X | | |
| 7 | X | | |
| 8 | X | | |
| 9 | X | | |

Table 2 represents what is believed to be the limitations of different technologies that may be used for notification.

Example: In an Event 1 scenario, the table indicates that a detailed message most likely will NOT be able to be sent due to number of recipients and the emergency message account should be short and concise.

In an Event 7 scenario, such as a known hurricane track, technology could be used that allows detailed information to be shared with the campus. An emergency web page might be the tool of choice in this event.

3. Population:

A further consideration is the size of the population that is to be alerted, and the concentration of facilities on the campus. For example, a large acreage campus with only a few buildings that are not close to each other and with a relatively small population (Example – University of West Florida) will have very different requirements and limitations than a large campus with a large population and with many buildings that are relatively close together (Examples - University of Florida, University of South Florida and University of Central Florida). The matrix in Table 3 can be used to examine the features and limitations of specific technologies for each of the scenarios and for the level of information needed for each scenario for a particular campus.

Table 3. Population and facilities density Matrix

| | Concentration of facilities at campus location | | |
|---|---|---|---|
| Population or population density | High | Medium | Low |
| High | | | |
| Medium | | | |
| Low | | | |

**Table 3 is left blank for use by an institution.**

Table 3 is a representation of the complexity and/or the campus population as it affects the need for the use of selected technology.

Example: The University of Florida, with greater than a 60,000 student/faculty/staff/visitor population on campus, is faced with a disaster event. To notify the campus within the desired time frame, a multitude of technologies may be needed. However, in a compact campus with a smaller population with a low level of population may not need as extensive technology to be deployed.

H. Technology Overviews and Standards:

The standards listed below are some basic level emergency notification system development and documentation requirement standards that all State of Florida universities and community colleges should follow when developing technical standards to be used during Requests for Proposals (RFP), Intent to Negotiate (ITN) or other procurement processes. Due to the complexity of the technology and the uniqueness of each institution, these standards should be considered in addition to any statutory, legal, administrative, or technical requirements needed to ensure that an emergency notification system meets the needs of the institution.

**The important factor in any consideration of different products and technologies in a total, comprehensive Emergency Notification System is that no one system will do all that is required and a total system will use the strengths of many different systems or technologies. An effective, viable Emergency Notification System will likely incorporate multiple systems, mechanisms and technologies.**

**Also important in an Emergency Notification System is that the technologies used must be designed and implemented properly, the systems maintained as required, tested thoroughly at the installation and during the lifetime of the system and that all participants in the program, including administrators, technical staff, operators and recipients, have initial and recurring training.**

**System Development Standards**

a. Proposals shall include Service Level Agreements (SLA's) dictating the minimum level of service, throughputs, restoration of service time, penalties, responsibilities, including loss of utilities, etc.

b. Proposals will include a project narrative, implementation plan, detailed equipment list with pricing, project timelines with milestones, and performance bonds (if applicable).

c. Proposals will include Acceptance Testing Procedures (ATP), acceptance criteria, testing roles and responsibilities for all participants in the project. The acceptance testing procedures should include all devices, parts and systems within the emergency notification system. The acceptance testing procedure shall test the equipment and the system's ability to deliver emergency notifications under the highest level of activation for which the system was designed.

1. Cellular Telephones:

The proliferation of cellular telephone technology throughout society today is astounding. The Commercial Telecommunications Industry Association (CTIA) reports that there are over 240 million wireless telecommunications subscribers in this country. According to the United States Census Bureau there is estimated to be 300 million people in the United States of America. This calculates to a figure that 79% of the US population is carrying wireless telecommunications devices. Taking into account that some individuals are carrying multiple devices and stockpiles, it would be safe to assume that at least 70 – 90% of the population of this country utilize a wireless telecommunications device.

The devices' widespread use, low cost and use by those individuals with disabilities, make it is a good choice of devices with which to build emergency notification strategies. While this is one of the most widely used emergency notification subscriber units, it is **NOT** the only device an emergency notification strategy should be built upon. Any emergency notification system strategy should employ multiple devices and systems to ensure that notifications are quickly and efficiently sent. This ensures that there will be redundancy built into the emergency notification system should any single device or system fail.

Most modern cellular telephones offer many features including voice, text messaging, video/photo capabilities and basic global positioning system (GPS) features. The Global Position System feature may be useful for location of individuals in an outdoor environment if they have enabled the telephone to send the GPS coordinates of the telephone. Some of these features provide the ability for the device to be used by multiple emergency notification system platforms resulting in multiple layers of redundancy.

Because cellular telephones are wireless devices they are susceptible to many of the problems inherent with wireless communications devices. These problems include but are not limited to:

- Issues with coverage inside of buildings or among buildings that are very close together.
- Cellular system capacity issues due to frequency availability, loading and use during critical times during an event.
- The telecommunications services that provide service to the cellular sites is often overloaded or compromised during critical times during an event.
- Cost to receive the message.
- Text Message limited to a maximum of 160 characters.

In addition to the technical problems listed above, it has been found that in the university and community college environment students may be instructed to turn their cellular telephones and/or paging devices off while inside of classrooms and lecture halls. This would result in most or all people in the classroom environment not receiving an emergency notification unless another indoor audio/video alert system is deployed.

**System Development Standards**

a. Proposed vendor to provide detailed coverage map(s) of campus. The map(s) will include sites that service the campus with the appropriate coverage contour analysis and Most Likely Server (MLS) plot maps. Indoor coverage maps shall be provided as dictated by technical specifications for specific procurement.

b. Proposed vendor of cellular based notification systems to provide documentation concerning the backup power, telephone services, facility capacity and how they impact the operation and performance of the proposed cellular based emergency notification systems.

c. Proposed vendor of cellular based emergency notification systems to perform a building coverage analysis of each building located on the campus grounds which will be serviced by the emergency notification system.

2. Computers and Personal Data Assistant (PDA):

Computers and Personal Data Assistant devices come in all different sizes, hardware configurations and operating systems. Many of these devices are equipped with wireless air cards and commercial wireless air card capabilities. These devices are reliant on connection to an Internet Protocol (IP) network via cable, wireless air card or commercial wireless air card to receive emergency text messages.

Many universities and community colleges do not have Internet protocol networks (cable or wireless) built out across their campuses. This presents a challenge to utilizing computers and personal data assistants as emergency text messaging devices. This device is a useful tool but it should **NOT** be the only device an emergency notification strategy should be designed upon.

The wireless air cards and commercial wireless air cards utilized in these devices are subject to some or all of the problems identified in the cellular telephone section of this report. In addition, the devices are subject to, but not limited to, the following problems:

- Configuration and setup issues
- Message delays due to network congestion

These devices should be utilized as part of an emergency text messaging notification system and used with other systems and devices in the institution's emergency notification strategy.

**System Development Standards**

a. Proposed computer and personal data assistant devices that are part of emergency notification system procurement shall be equipped with the latest industry standard hardware, operating system, wireless LAN adapter card(s) and peripherals.

b. University and community colleges shall ensure that proposed computer and personal data assistant devices that are part of emergency notification system solicitations are compatible with the campus' existing wire line and/or wireless networks.

c. Proposed computer and personal data assistant devices that are part of emergency notification system procurement shall be Energy Star compliant.

d. University and community colleges should make students and faculty aware of the existence of any wireless text messaging emergency notification systems. Any instruction or informational brochure and/or documentation shall include the necessary settings and setup information for the individual to properly install and configure the wireless LAN or cable LAN adapter in their computer. The documentation should also contain contact information for technical assistance should the individual encounter any installation and/or setup issues.

3. Text Messaging Systems:

There is a multitude of text messaging systems available on the market today. They vary widely in the technologies employed, sophistication, capacity and efficiency to deliver messages. They can be as simple as a basic e-mail or distribution list to a dedicated emergency text messaging notification system.

Text messaging systems consist of hardware, software and telecommunications infrastructure. Each part of the system has its own unique design criteria and issues. Careful attention must be given to all areas when implementing these systems to ensure a successful deployment. These systems may be used with cellular telephones, computers**,** personal data assistants and other devices for the reception of emergency notification messages. Hearing impaired individuals typically use the text message system.

Many of the new text messaging emergency notification systems offer features such as user definable security levels, custom message headers/footers, delivery status reports, preformatted messages, remote access via Internet, toll free number or cellular telephone and multiple delivery addresses for each recipient.

Due to the systems use of cellular telephones for the end user device, the system is susceptible to the same problems listed in the cellular telephone section of this report. In addition, the system may experience problems associated with Internet or telecommunications problems. The problems include, but are not limited to:

- Message delays due to network or Internet traffic congestion.
- System outages due to public telephone system failures.
- System outages and/or delays due to cyber attacks.

These systems may be purchased or procured through subscription contracts. Which method of procurement is employed is dictated by an institutions needs and available resources.

## System Development Standards

a. Institutions should review their communications infrastructure assessment, internet technology staffing levels and expertise to decide which procurement methodology to follow (purchase or service contract).

b. Regardless of procurement method used, the university or college should evaluate its telecommunications services that provide the Internet Protocol (IP) connection to the outside to ensure that there will be sufficient bandwidth to support the addition of the proposed emergency text messaging system. Remember that this system will have to run in addition to the normal day-to-day network traffic. Divergent routing of these services should be utilized if at all possible. This will reduce the likelihood of a single point of failure within the system.

c. Proposed vendors of emergency text messaging notification services shall provide copies of their Service Level Agreements (SLA's) with the wire line and wireless carriers that provide services to the university or community college in their proposals.

d. Proposed vendors of emergency text messaging notification services shall have multiple messaging servers and router locations that are located in different states and cities. These servers will be capable of automatically picking up system operation should a location become inoperable. Documentation listing the location of key elements (servers and routers) of the system will be included in all proposals.

e. Proposals for emergency text messaging notification systems shall have multiple messaging servers and router locations that are located in different locations and/or cities. These servers will be capable of automatically picking up system operation should a location become inoperable. Documentation listing the location of key elements (servers and routers) of the system will be included in all proposals.

f. Proposals shall include documentation listing message delivery rate capabilities based on proposed system architecture, telecommunication SLA's and software design.

g. Proposals shall include detailed descriptions of security features used within the emergency text messaging notification system to maintain the system's integrity against unauthorized activation, authentication and tampering with message delivery.

h. Proposed emergency text messaging notification systems shall have the ability to allow the customer to define a message header/footer made up of alphanumeric characters and/or graphics that clearly define the message as an emergency notification and the originator.

i. Proposals shall include Service Level Agreements (SLA's) dictating the minimum level of service, throughputs, restoration of service time, penalties, responsibilities, etc.

j. Proposals will include a project narrative, implementation plan, detailed equipment lists with pricing, project timelines with milestones, and performance bonds (if applicable).

k. Proposals will include Acceptance Testing Procedures (ATP), acceptance criteria, testing roles and responsibilities for all participants in the project. The ATP should include all devices, parts and systems within the emergency notification system. The ATP shall test the equipment and the systems' ability to deliver emergency notifications under the highest level of activation for which the system is designed.

4. Telephones:

Telephones still remain the basic form of telecommunications in the United States. Even with the revolution of technology and the explosion of wireless telecommunications devices, wire line telephones still occupy many homes across the country. In recent years, Internet Protocol based telephone services have been expanding in the business and private sectors of the communities around the country. Each technology presents unique possibilities and challenges when developing emergency notification systems and strategies. For this reason, this report will deal with IP telephones as a separate technology.

Conventional telephone devices are very inexpensive but they require a dedicated telephone line and number which is routed to the Private Branch Exchange (PBX) switch or directly to the telephone company Central Office (CO). Users of these devices can call a nationally recognized emergency number (911) in most areas of the state to reach emergency services in times of need. The devices are well suited for use by the visually impaired due to the fact that they are primarily an audio device.

Most university and community college campuses do not have conventional wire line telephones in the classrooms or lecture halls. Where they exist, these devices could still be used as part of an effective emergency notification system and strategy.

Conventional telephones are analog devices and susceptible to the following problems:

- Problems receiving emergency messages due to noise on the telephone line or low audio.
- System outages or congestion during critical event times.

There are other operational issues that arise with the use of telephones. The University of Central Florida study stated that 50% of students and faculty will not immediately pick up a ringing telephone. As a result many students and faculty would miss emergency notifications unless the telephone device is coupled with automatic answering systems. Even with the automatic answering systems, the delay in responding to the emergency notification could make the notification meaningless.

**System Development Standards**

a. Universities and community colleges shall review their communications infrastructure assessments to verify what telephone services are available to the campus and on campus. It typically takes months or longer for a telephone company to bring additional cable into a facility.

b. Any new telephone technology that is purchased as part of an emergency notification system shall include an audible and visual (strobe or LED) type indicator that will alert the user that a call is being received.

c. Universities and community colleges will maintain an emergency contact list for telephone company representatives.

d. Proposals for emergency notification systems that include telephone devices or proposals for emergency telephone devices will include all cabling from the telephone company demarcation point to the telephone device, as well as any associated jacks or connecting blocks.

5. IP Telephones:

Internet Protocol (IP) telephones or Voice Over Internet Telephone (VOIP) service is becoming more commonly used. This is primarily due to its low cost, shared cabling infrastructure with computer networks and ability to be serviced by existing IT personnel. The devices come in wired and wireless models enabling a great deal of flexibility in the design of systems.

The emergence of Internet Protocol telephones in homes and businesses has created a unique problem for public safety 911 centers. Each device is assigned a unique Internet Protocol address that resides on the Internet Protocol network only. The telephone lines are attached to a special router on the network. Therefore, when a caller places a 911 call, the center is usually unable to receive Automatic Location Information (ALI) from the caller as it would from a normal telephone call. Newer versions of this technology have the capability of maintaining user tables that can transfer caller locations to the 911 center. There are currently national committees developing standards for the next generation of equipment to resolve the problem but, there is no standard solution today.

Some of Florida's universities and community colleges are currently moving towards implementing IP telephone networks on their campuses. These devices may be an especially useful tool in any emergency notification system or strategy because they may have features that make them useful to the hearing and visually impaired. These devices may also be individually addressed or grouped together for emergency notifications. This device is a useful tool, but it should **NOT** be the only device an emergency notification strategy should be built upon.

Internet protocol telephones can be used with autodialing systems, emergency text messaging systems and calling trees as part of an overall emergency notification strategy. Depending on the model chosen and the mode of operation chosen, the devices may experience some of the same problems identified in the cellular telephone, telephone and text messaging sections of this report.

IP Telephones are network devices and may be wireless devices operating in an unlicensed band which could lead to the following problems, but are not limited to:

- Interference and blocking of calls (Wireless)
- Message delays or blocking due to cyber attacks
- Message delays or failures due to network traffic or telephone/network system failures
- Unauthorized system use (Hacking)

There are other operational issues that arise with the use of IP telephones. The study completed by the University of Central Florida concluded that 50% of students and faculty will not immediately pick up a ringing telephone. As a result many students and faculty would miss emergency notifications unless the telephone device is coupled with automatic answering systems. Even with the automatic answering systems, the delay in responding to the emergency notification could make the notification meaningless.

## System Development Standards

a. Universities and community colleges shall review their communications infrastructure assessments to verify what telephone services are available to the campus and on campus. It typically takes months or longer for a telephone company to bring additional cable into a facility.

b. Any new IP telephone technology that is purchased as part of an emergency notification system shall include an audible and visual (strobe or LED) type indicator that will alert the user that a call is being received.

c. Universities and community colleges will maintain an emergency contact list for telephone company representatives and Internet Technology personnel.

d. Proposals for emergency notification systems that include IP telephone devices or proposals for emergency Internet protocol telephone devices will include all cabling from the telephone company demarcation point and/or IP switch to the telephone device, as well as any associated jacks or connecting blocks.

e. Vendors proposing the use of wireless Internet protocol networks as part of any emergency notification system shall complete a wireless local area network system survey of all areas of the campus including all grounds and inside of all buildings on the campus. The survey results will be included in the proposal in the form of maps and tables indicating the location, identification, address and any other pertinent information of any existing wireless networks found on the campus. The university or community college Internet technology department should verify this information against its records gathered during its communications infrastructure assessment.

6. Wireless Local Area Network (LAN):

Many of the different communications devices used by faculty and students on the campuses of Florida's universities and community colleges utilize either wireless telephone or Internet technology networks or both. The proliferation of laptop computers and personal data assistant devices on our campuses has created a great demand for wireless local area network services. Most of our universities and community colleges have been unable to meet the demand.

A proliferation of privately owned wireless local area network services has sprung up on and around our state's university and community college campuses. This creates a host of problems when trying to design and implement wireless local area network services on the campuses. **For this reason, it is recommended that any wireless local area network intended to serve as the infrastructure for an emergency notification system be used entirely for that purpose and that the system be run and managed by the university police department, community college police/security department or local public safety agency as designated by the university/college. This would then make the system eligible to utilize the licensed 4.9 GHz public safety band for its wireless local area network**. This would help to eliminate the problems inherent with the use of the 2.9 GHz unlicensed band.

The wireless local area network standard in use today is known as the 802.11 (x) where (x) stands for a revision of the standard. The most common standards in use today are the 802.11b and the 802.11g. Most wireless local area network systems on the air today are operating under one of those standards. Newer broadband technologies are appearing on the market and do offer better frequency and security protocols but care should be exercised in deployment of these systems as an emergency notification infrastructure. Regardless of the standard, they all use the same 2.9 GHz frequency set which is an unlicensed frequency set. This means that no Federal Communications Commission licensing is required to set up or establish a wireless network on the air. Listed below are some, but likely not all, of the problems associated with the deployment of these systems, but they are not limited to:

**System Development Standards**

a. Universities and community colleges shall review their communications infrastructure assessments to verify what wireless Local Area Network (LAN) systems are operating on or around their campuses and within their buildings.

b. Wireless LAN systems utilized for emergency notification systems will utilize all industry best practices and security protocols including, but not limited, to blocking the broadcast of the system ID and/or Media Access Control (MAC) address, Wired Equivalency Privacy (WEP), Virtual Private Network (VPN), encryption and use of static IP addressing.

c. Universities and colleges deploying wireless LAN systems for emergency notification systems should not allow the network to be utilized for routine network, Internet and e-mail system functions. The system integrity should be preserved to ensure full system capacity and functionality when needed for emergency notifications.

d. Universities and colleges deploying wireless LAN systems for emergency notification systems should utilize the licensed 700 MHz or 4.9 GHz public safety frequency bands for their wireless LAN systems whenever possible. This may require the university, college or local law enforcement agency to act as the system licensee on the institution's behalf.

7. Internal Mass Telephone Notification Systems:

Many different brands of Internal Mass Telephone Notification systems are available on the market today. All of them work in the same way. The message originator types or records a voice message into the system. The system then sends that message out over the public telephone system to the individuals listed in the calling database.

There are two basic types of systems available: stand alone and host based services. Each university or college must evaluate its infrastructure, campus, and operations to determine which system and features are best suited to be part of their emergency notification systems strategy.

Some of the features available in these systems are automatic answering machine detection, faxing capability, multiple device delivery, remote launch capability, E911 data ready, geo-calling, Telephone Typewriter (TTY)/Telecommunications Device for the Deaf (TDD) calling and call status reporting. Many of the products offered by various vendors include these features or different combinations of these features. Careful consideration should be given as to which features meet the needs of the user. Whatever system and feature set is chosen, the university or college should ensure compatibility with other existing or proposed emergency notification system components.

Internal Mass Telephone Notification systems are dependent on the telecommunications infrastructure for the delivery of emergency messages. Regardless of the system type, these systems are all susceptible to the same problems listed earlier in this report regarding cellular telephones, telephones, text messaging, wireless local area network and other technologies. As is the case in any emergency notification system, the system is susceptible to any problem associated with any component or device to which the system is connected.

Some, but likely not all, of the problems encountered by autodialing systems are the following:

- Undelivered or delayed message delivery due to network or telecommunications infrastructure outages or congestion
- Inability to deliver messages due to database errors

These systems are very similar to text messaging systems in the need for accurate records and database management requirements. If the system(s) databases are not kept current with accurate information, then emergency notification messages may not be delivered or may be received by unintended recipients.

**System Development Standards**

a. Universities and community colleges shall review their communications infrastructure assessments to verify what telephone services are available to the campus and on campus. It typically takes months or longer for a telephone company to bring additional cable into a facility.

b. Proposed vendor(s) of Internal Mass Telephone Notification systems will provide documentation concerning the backup power, telephone services, facility capacity and how they impact the operation and performance of the proposed emergency notification systems.

c. Proposed vendor(s) of Internal Mass Telephone Notification systems will provide documentation of certification agreements with wire line and wireless carriers that proposed

systems are capable of delivering the number of emergency messages published in their proposal for all three standards set forth in this document.

8. Audio/Video Display Devices:

Audio/Video display devices come in many different types, shapes and sizes. They can include in-house or on-campus video monitors, dynamic message boards, 'live' billboards, scrolling signs and displays. These devices should be a component of an emergency notification system(s) and/or strategy.

A basic video monitor may be relatively inexpensive and may be utilized with multiple emergency notification systems for the dissemination of emergency messages. More elaborate mobile variable message boards with satellite or wire line/wireless networking capabilities are also possible, which allow the user to place the monitor at any location at any given time and remotely activate and send messages to the unit. When monitors are configured with speakers they become an emergency notification system that can be utilized by the visually and hearing impaired.

Many different features are available within these devices including computer interfaces, internet protocol network interfaces, various video resolution standards, various audio standards and closed captioning for the hearing impaired.

Depending on which type of receiver or monitor is chosen, features employed and the emergency notification system to which they are connected, these devices may encounter problems associated with any of the other components in the emergency notification system. In addition these devices may experience the following problems, but are not limited to:

- Interference from other radio frequency sources
- Screen burn in (Cathod Ray Tube)
- Short life (Plasma)

**System Development Standards**

a. Universities and community colleges shall review their communications infrastructure assessments to verify what infrastructure is available to support audio/visual systems and which systems are operating on or around their campuses and within their buildings.

b. Proposed devices should be capable of supporting as many different inputs at the highest quality resolution possible to ensure connectivity with the different emergency notification system components employed.

c. Proposed devices should be energy star compliant (monitors).

d. Proposed television devices for emergency notification systems shall be equipped with closed captioning decoders.

e. University and colleges should evaluate their campuses to determine the best locations for audio/visual emergency notification devices beyond those identified in the original communications infrastructure assessment study.

f. Variable Message Boards or Signs shall include some form of Internet Protocol connectivity via cellular, wireless Local Area Network, satellite connectivity, Local Area Network or cable to allow messages to be remotely sent to the unit.

g. Proposed vendors of audio/video emergency notification systems will provide documentation that proposed device will provide the level of audio needed to be heard by audience in intended viewing area.

9. National Oceanic and Atmospheric Administration (NOAA) Weather Radio:

There are several warning and notification systems based upon radio frequency transmission that can and should become a component of an Emergency Notification system.

National Weather Radio Program

The best known radio system is the National Oceanic and Atmospheric Administration's (NOAA) Weather Radio System. The National Weather Radio Program is a nationwide network of radio stations broadcasting continuous weather information directly from a nearby National Weather Service office. National Weather Radio broadcasts warnings, watches, forecasts and other hazard information 24 hours a day.

Working with the Federal Communication Commission's Emergency Alert System, National Weather Radio is an "All Hazards" radio network, making it your single source for comprehensive weather and emergency information. In conjunction with Federal, State, and Local Emergency Managers and other public officials, National Weather Radio also broadcasts warning and post-event information for all types of hazards – including natural (such as earthquakes or avalanches), environmental (such as chemical releases or oil spills), and public safety (such as AMBER alerts or 911 Telephone outages).

Known as the "Voice of NOAA's National Weather Service," National Weather Radio is provided as a public service by the National Oceanic and Atmospheric Administration (NOAA), part of the Department of Commerce. National Weather Radio includes more than 970 transmitters, covering all 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories. National Weather Radio requires a special radio receiver or scanner capable of picking up the signal. Broadcasts are found in the VHF public service band at these seven frequencies (MHz):

NOAA Weather Radio All Hazards transmitters broadcast on one of seven VHF frequencies from 162.400 MHz to 162.550 MHz. The broadcasts cannot be heard on a simple AM/FM radio receiver. However, there are many receiver options, ranging from handheld portable units which just pick up National Weather Radio - to desktop and console models which receive National Weather Radio in addition to other broadcasts.

Prices can vary from $20 to $200, depending on the model. Many receivers have an alarm feature, but some may not. Among the more useful features in a receiver are:

***Tone alarm:*** The National Weather Service will send a 1050 Hz tone alarm before most warning and many watch messages are broadcast. The tone will activate all the receivers which are equipped to receive it, even if the audio is turned off. This is especially useful for warnings which occur during the night when most people are asleep.

***SAME technology:*** Specific Alert Message Encoding (SAME) allows you to specify the particular area for which you wish to receive alerts. Most warnings and watches broadcast over NOAA Weather Radio are county- or independent city-based (parish-based in Louisiana), although in a few areas of the country the alerts are issued for portions of counties. Since most National Weather Radio transmitters are broadcasting for a number of counties, Specific Alert Message Encoding receivers will respond only to alerts issued for the area (or areas) you have selected. This minimizes the number of "false alarms" for events which might be a few counties away from where you live.

***Selectable alerting of events:*** While Specific Alert Message Encoding allows you to specify a particular area of interest, some receivers allow you to turn off the alarm for certain events which might not be important to you. For example, if you live in a coastal county, but not right at the beach, you might not care about Coastal Flood Warnings.

Emergency Alert System

The Emergency Alert System allows broadcast stations, satellite radio, cable systems, DBS systems, participating satellite companies, and other services to send and receive emergency information quickly and automatically, even if their facilities are unattended. The Emergency Alert System was designed to ensure that if one link in the dissemination of alert information is broken, members of the public have multiple alternate sources of warning. Emergency Alert System equipment also provides a method for automatic interruption of regular programming, and is able to relay emergency messages in any language used by the Emergency Alert System participant.

Along with its capability of providing a national message to the entire public simultaneously, the Emergency Alert System structure provides authorized state and local personnel with a quick method to distribute important local emergency information. A state emergency manager may use the system to send out a public warning by broadcasting that warning from one or more major radio stations in a particular state. Emergency Alert System equipment in other radio and television stations, as well as cable systems in that state, can automatically monitor and rebroadcast that message.

Additionally, Emergency Alert System equipment can directly monitor the National Weather Service for local weather and other emergency alerts, which local broadcast stations, cable systems, and other Emergency Alert System participants can then rebroadcast, providing an almost immediate relay of local emergency messages to the public.

The Emergency Alert System is constantly being upgraded and improved so that it can take full advantage of digital and other emerging communications technologies. In addition, the Federal Communications Commission is mandating methods to ensure that Emergency Alert System alerts reach all Americans, including those with hearing and vision disabilities and those who speak languages other than English.

**The NATIONAL WEATHER RADIO and Emergency Alert System programs can be extremely effective in rapidly warning and notifying large area or population bases but are less effective to provide warnings to small geographic areas or small population groups. However, the NATIONAL WEATHER RADIO and the Emergency Alert System programs should be a component of any Emergency Notification System.**

**System Development Standards**

a. Proposed weather radio devices that are part of an emergency notification system should include Specific Alert Messaging Encoding technology and Selectable Alerting of Events.

b. Proposed weather radio devices that are part of an emergency notification system shall at a minimum, be deployed at the location where emergency notification messages are originated. This location shall be staffed 365/24/7 days a week. Ideally, these devices should be deployed in dormitory rooms, common areas and class rooms.

c. Proposed weather radio devices shall include a battery backup to operate during times of power failures.

d. Proposed weather radio devices shall include a visual indicator and display for the hearing impaired.

10. Other Radio Based Warning and Notification Systems:

There are a number of other systems currently on the market, being implemented or being developed that utilize radio to disseminate emergency information. Industries are constantly researching and developing new mechanisms using new technologies. Most promising is alerting radios that monitor the new High Definition Radio sub-carrier data streams (RDS) to provide specific warnings to individual radios. These systems are relatively new on the market and show great promise for sending emergency messages to individual devices. Some of the problems that may be encountered include, but are not limited to:

- System coverage
- Interfacing with existing systems

Pagers, while considered by some to be legacy technology, can serve a valuable function in Emergency Notification System if, as with any system, used properly. They also are prone to the problems listed above.

**System Development Standards**

a. Proposed vendors of High Definition Radio sub-carrier data streams systems and devices or pager systems and devices as an emergency notification system shall provide detailed coverage maps of their service areas.

b. Proposed vendors will provide documented test results of delivery rates for proposed emergency notification systems.

c. Proposed devices will be capable of delivering emergency messages in voice and text with a visual and audible alert.

11. Television and Radio:

Campus based radio and television stations can also be a component of an Emergency Notification System and should be incorporated, if available, in all warning systems. Commercial television and radio stations should also be utilized as part of a university or college's emergency

notification strategy. The Emergency Alert System utilizes these stations for the broadcasts of emergency messages.

12. Satellite Communications:

    Satellites are extremely popular and effective in providing voice and data information to commercial entities, broadcast stations and networks and to fixed locations. Satellites, however, are less effective in providing rapid warning and notification to individuals, small areas or small groups of people. Satellites can be used to move voice and data from an origination point to a device or service where it will be retransmitted to the target population. As a result, in a small, localized Emergency Notification System, satellite technology will serve no purpose in the delivery of warning and alerting information to the intended target (recipient). Satellites can serve as an 'upstream' delivery path, such as from one radio station to another, from one County Emergency Operations Center to the State Emergency Operations Center, or from one campus to another.

    Satellite telephones are popular as a back up to the landline or cellular telephone services when the normal telephones fail due to infrastructure damage or circuit overload. Satellite telephones can serve as an effective backup but their inherent limitations (must be outside, must have view of southern sky, relatively poor audio quality), they should be considered as a 'last-used' tool only.

13. Outdoor Sirens/Audible and Public Address Systems:

    Extremely effective for warning small geographic areas and small, close together groups of people in an outside or open environment, outdoor siren and audible warning systems (public address systems) should be a foundation component of any localized Emergency Notification System. Sirens, and associated audible devices, are quickly activated, will draw the immediate attention of anybody within hearing and are not easily confused. By themselves, however, sirens do not provide the detail of information needed for the recipient to take protective action and a siren warning must be followed by additional information, such as voice announcements, radio broadcasts, text messaging, e-mails, etc., or any of the other alerting mechanisms discussed herein. Sirens are totally ineffective when the targets are inside, during severe weather and across wide areas. Siren technologies, like all technologies, have undergone tremendous transformations and improvements recently and some of the previous opposition to sirens as a primary warning device has been overcome by the implementation of the new siren technologies. An ideal local area Emergency Notification System would be the immediate sounding of a siren upon recognition of the need for a warning. The siren would advise the listeners that an emergency is underway and that the listeners should immediately seek a source of additional information, such as the type of emergency, location, protective action to take and duration of the emergency.

    **Again, sirens by themselves do not provide the information needed for the target to take protective action. A siren sounding, followed by an announcement or text message containing the appropriate information in another venue; however, can be an effective and reliable warning mechanism.**

    **Note: The Committee has not been able to find a definitive authority for standards regarding the audibility level of sirens on university/college campuses.**

14. Websites

Campus website(s) are an effective tool in an emergency notification system or strategy. Important information such as emergency response procedures, emergency contact information and event status information may be posted on campus websites. These sites are a valuable informational tool used to reach those individuals who reside outside of the "immediate" campus vicinity or who do not require immediate notification of an event.

Websites are prone to some of the same problems as local area networks or text messaging systems depending on the configuration and features of the website. Some of the problems associated with campus websites are as follows, but are not limited to:

- Delay in message delivery or event status updates due to network outages or congestion
- Website unavailability due to cyber attack or network outage

**System Development Standards**

a. Universities and colleges should make emergency notification screens part of their main web page.

b. Universities and colleges should consider off-site back up servers such as the Department of Education's servers to host back-up websites for emergency notification pages and emergency notification information.

c. Universities and colleges should make emergency notification system and website information available to faculty and staff at beginning of each semester.

15. Informational Telephone Lines

The use of toll free or informational telephone lines has proven to be a very effective means of conveying information regarding emergencies. The use of these telephone lines in conjunction with other informational services such as websites helps the university or college to provide information to individuals of the campus community that do not require immediate notification. This allows other emergency notification resources to concentrate on the immediate notification of those individuals that require it.

Informational telephone lines use the public telephone system and are subject to the same problems listed in the telephone and cellular telephone sections in this report. The use of informational telephone lines require properly trained staff and/or equipment to effectively manage the situation.

Problems or issues that may be experienced with the use of informational telephone lines are, but may not be limited to:

- System outages due to telephone infrastructure failures or capacity problems
- Staffing problems during event due to affects of event on personnel in area
- Updating call takers with current information

**System Development Standards**

a. Universities and colleges shall review their communications infrastructure assessments to verify what telephone services are available to the campus and on campus. It typically takes months or longer for a telephone company to bring additional cable into a facility.

b. Universities and colleges should establish procedures for the answering of informational requests that result as a part of an emergency notification message. Faculty and staff should be trained in the proper response to such inquiries.

c. Proposed vendors of answering services for emergency notification messages and/or informational services will work with the university or college to establish a written procedure for the documentation and dissemination of emergency messages. These procedures should become part of the scope of work for the contracted services.

d. Proposed vendors of answering services for emergency notification messages and/or informational services shall provide documentation as to the location of call centers, number of call takers per shift at each call center, number of incoming telephone lines that provide service to each call center and the average daily call volume of each call center.

16. Emergency Notification System Integration and Redundancy

Key elements to any emergency notification system or strategy involve the integration of the various elements and components of those systems or strategies and the redundancies built into them. There are various hardware and software applications that are available to help integrate existing emergency notification systems with new systems and components. Integration includes not only the combining or the tying together of various technologies, but also the integration of people, policies and procedures in conjunction with the technologies to form a robust and efficient emergency notification system.

Redundancy should be built throughout the emergency notification system. This should include key infrastructure items such as power, key telecommunications services, personnel and plans. Emergency notification systems are only as reliable and efficient as the weakest point in the plan, infrastructure, technology or operation of the system

**System Development Standards**

a. Universities and community colleges should review their communications infrastructure assessments, emergency operations plans and emergency notification plans to verify that all plans, policies and procedures are in place to effectively meet the emergency notification standards set forth in this document. A regularly scheduled review process should be written into each plan.

b. Universities and community colleges should work with institutional experts, vendors, state and local agencies to identify deficiencies in critical infrastructure and to develop plans in improving redundancy in the critical infrastructure supporting our universities and community colleges. This should be done as part of any initial communications infrastructure assessment.

c. Proposed vendors of emergency notification integration systems should provide at least three references of successful system integrations and implementations of the technologies listed in any solicitation for which they respond.

I. Best Practices Guide - Use, Maintenance and Testing of Emergency Notification System:

1. Testing:

a. The emergency notification system should be regularly tested on a weekly basis with selected faculty and staff to ensure the systems(s) functionality and reliability in accordance with the established university/colleges operational policies and procedures. This test does not anticipate the inclusion of the audible portion of the outdoor audible alert component.

b. The emergency notification system's outdoor sirens and/or public address systems should be tested on a monthly basis at a minimum in accordance with the established university/colleges operational policies and procedures. Public notice should be given informing the community of the regularly scheduled testing of the system. Regularly scheduled testing alert tones should be standardized and different from emergency alert tone. It is recommended that emergency notification system alert tones should be limited to two tones, one for regularly scheduled testing and one for emergencies.

c. Testing of emergency notification system devices and systems will conform to all federal, state and local codes, regulations, statutes and laws.

d. Testing of the emergency notification system will be performed in accordance with the manufacturer's specifications.

2. Maintenance:

a. Maintenance of the emergency notification system will be performed in accordance with the manufacturer's specifications.

b. Only qualified personnel will perform maintenance on the emergency notification system or maintenance contracts with qualified vendors will be procured during the useful life of the system.

c. Maintenance contracts and/or specifications for emergency notification systems will provide 365/24/7 on-site service with four hour response time.

d. Maintenance and testing logs of the emergency notification system for each component of the system will be maintained by the university/college. Maintenance records will be audited by the university/college safety officer or committee.

3. Use:

a. University/colleges should review their operational policies and procedures regarding emergency notifications to ensure that they can comply with all three standards of emergency notification set forth in this document.

b. The emergency notification system will not be used for routine or daily communications except for routine testing.

c. Emergency operation plans will include procedures for emergency notification system activation for all three standards set forth in this document.

d. All emergency messages will be clearly identifiable as an emergency notification system message according to the Common Alerting Protocol (CAP).

4. Training:

a. Periodic training for specific emergency notification system devices will be performed according to the manufacturer's recommendations.

b. Orientation for new employees and new students will include training for the emergency notification system.

c. In an effort to reach visitors to the campus, university/colleges web sites and informational signs/documents will be posted and include instructions regarding emergency notification system procedures.

5. Implementation Strategies:

The following questions and concerns should be addressed in addition to the standards and best practices set forth in this document when developing an emergency notification system and strategy:

a. Determine who at the institution has the authority to activate the Emergency Notification System.

b. Determine who will approve, if any, the message sent out on the Emergency Notification System.

c. Determine if the above items can be accomplished after normal institution hours.

d. Once an emergency message is approved, what must be done at the institution to send the message out using the technology?

e. How will the institution confirm that the emergency message has been sent?

f. To which groups, if any, will the emergency message be sent (audience)?

g. If there is a limitation on getting an emergency message out within a given time frame, what is the priority within the campus community to receive the message?

h. List all technologies in use to delivery an emergency message. Determine if there is emergency power to support these systems. What can survive a phone system failure?

i. How will the institution test the Emergency Notification System?

j. How is the coordination with adjunct areas to campus managed?

k. If text messaging is used in the Emergency Notification System, how will the participants' phone numbers be updated and how often?

l. How is the local Emergency Management Office notified of an emergency requiring the use of the Emergency Notification System?

m. How are local public safety agencies notified when Emergency Notification System is used?

n. How will the emergency messages be saved for public records?

o. Who is given actual control of the Emergency Notification System for testing and repair?

J. References:

1. Clery Act - Federal statute, 20 U.S.C. § 1092(f), with implementing regulations in the U.S. Code of Federal Regulations at 34 CFR 668.46.

2. Common Alerting Protocol - http://www.oasis-open.org/committees/download.php/6334/oasis-200402-cap-core-1.0.pdf

3. Warning, Alert, Response Network Act (WARN) - http://www.fcc.gov/pshs/cmsaac/docs/pdf/WARNactextract.pdf

4. Commercial Mobile Service Alert Advisory Committee (CMSAAC) http://www.fcc.gov/pshs/cmsaac/

5. CALEA – Commission on Accreditation for Law Enforcement Agencies http://www.calea.org/

6. ICALEA – International Association of Campus Law Enforcement Administrators http://www.iaclea.org/

7. UCF Report - http://www.dcf.state.fl.us/campusSecurity/docs/ExecSummaryEMERGCOMFinalReport051807.pdf

8. Federal Communications Commission Rules and Regulations Title 47 - http://wireless.fcc.gov/rules.html

9. Siren Standards - http://webstore.ansi.org/ansidocstore/product.asp?sku=ANSI+S12.14-1992+( R2002) (ANSI S12.14)

   http://www.civildefensemuseum.com/docs/femacpg1-17n.pdf (FEMA /CPG 1-17)

10. NOAA Weather Radio – http://www.nws.noaa.gov/nwr/nwrrcvr.htm

    http://www.ce.org/aboutcea/ceainitiatives/viewInitiativesOverview.asp?na

K. Questions for vendors

1. Given the information above, how do you recommend addressing each scenario and the issues within them?

2. Provide at least three examples of event scenarios that fit into each of the matrix elements for Tables 1 and 2.

3. If there are multiple solutions for a scenario, what are the cost/performance/benefits tradeoffs?

4. How do you address the requirements for disabled persons (hearing or vision impaired) or non-English speaking persons?

5. What design criteria do you recommend for a system?

6. What comments do you have on the information and matrices provided above?

7. Are there any economies of scale with your offerings that would be practical to implement – for example, addressing the needs of multiple institutions and/or locations with a common system?

8. How will you address the requirements of the WARN Act and the Common Alerting Protocol (CAP) requirements?

9. How will you assure interoperability with different systems that may be provided by other vendors to some Florida campuses?

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N. Additional Source Material:

1. The resources listed in this section should be considered when developing technical standards for Global Positioning System (GPS) based emergency notification system components. The use of common data format helps ensure the transfer of location data across systems.

http://www.floridadisaster.org/gis/USNG/index.htm

http://www.fgdl.org/

2. Resources listed in this section define standards and recommendations regarding electronic and information technology procured by the federal government for its use by individuals with disabilities.

http://www.access-board.gov/sec508/update-index.htm
http://teitac.org/