MAINTAINING BUILDING SECURITY for the large and growing University of North Carolina’s historic Chapel Hill campus is a continuing job that requires lots of planning. In order to provide a higher level of access control for the 350 buildings supported by its Facilities Services/Life Safety Services staff, UNC-CH recently initiated an upgrade to a proprietary key system that eliminates the possibility of unauthorized key duplication. At the same time, UNC-CH has installed new key management policies to ensure that all keys are accounted for.

The 729-acre UNC Chapel Hill central campus is among the most beautiful in the nation, according to the American Society of Landscape Architects. Authorized in 1776 by the North Carolina Constitution, it was the nation’s first state university and the nation’s only public university to award degrees in the 18th century. In fall 2006, the campus enrolled more than 27,500 students from all 100 North Carolina counties, the other 49 states and more than 100 countries. Today, the campus is undergoing a major renovation made possible by a bond issue that provided $515 million for renovations, repairs and new buildings.

Along with the renovation, campus security is being upgraded. A major focus is improved access control. The Chapel Hill Facilities Services/Life Safety Services staff is responsible for security in 350 campus buildings, not including the hospital and residence facilities, which have their own security staffs. As the UNC’s Chapel Hill campus is moving into a higher security level that includes computer-managed control of key distribution and patent-protected restricted keys. The entire system can be managed from the Access Control department’s office.
campus grew, key control became less effective than desired, with records not accurately reflecting who had keys to which doors. Often, keys were turned over from a person to his or her successor instead of being turned in and reissued as required. Unauthorized key duplication was a possibility as well.

**Upgrading Security**

In order to improve key control and enhance security, UNC-Chapel Hill moved to implement a new patent-protected key system, added biometric access control to such critical areas as laboratories and computer facilities, and instituted a stronger key control policy.

Michael Burch, Access Control Supervisor, says, “We have a mandate to care for our students, faculty and staff as well as the buildings themselves, so we need to be proactive in providing the best level of security that we can. At the same time, security can be intrusive, so we need to minimize the inconvenience to the people we serve.”

A large and ongoing part of the upgrade is a switch to a proprietary key system, which includes a patent-protected keyway that prevents unauthorized key duplication. Burch explains, “No one else in the country will have this keyway. It is only for this campus, and I have to sign documentation to get the keys and cylinders directly from the manufacturer. We can cut the key blanks and pin the cylinders, but no one else can get them.”
The campus uses interchangeable cores to simplify re-keying, especially in emergencies. Burch says that, previously when someone lost a key ring, had it stolen or failed to turn it in when leaving the university, it took three locksmiths as much as three twelve-hour days to re-key a building. Now, he states, his department keeps close to 200 cores ready for emergency re-keying. “With interchangeable cores, it takes us hours instead of days to re-key a building,” he adds.

To help control key distribution, the university is also planning to install an electronic key cabinet in the maintenance room of every building instead of issuing master keys. Authorized individuals who need access to specific areas will then swipe their identification card and use a PIN code to check out the required key or keys. Burch adds, “The system will send an e-mail to...”

Conversion to the new key system is an ongoing process. Burch says, “When we do a major building renovation, we will change to the restricted keyways. All new construction also will have the new cylinders, and as budgets and time allow, we will increase the number of buildings we change.”

“The system will send an e-mail to the person’s supervisor if a key isn’t turned in at the end of the day or the project. That will give us an audit trail, and they can’t put the key back in the wrong place, so we always will know where each key is.”

“We’re also in the process of educating the University staff, so that when “Joe” leaves, you have to turn in his keys to the access control shop,” Burch points out. “Then when “Sam” takes his place, we need his photo identification to assign him the keys he needs. They can’t just give “Joe’s” keys to “Sam”. We also will be adding a serial number imprint to every key so it is completely traceable.”

Each department or building will have a designated key contact person, who will have the necessary software to track the keys for which he or she is responsible. Burch notes that his access control department will be able to check the audit trails the system provides at any time to find out who has a specific key.

In addition to locks and keys, other door hardware also plays an important role in controlling access. Typically, touch pad devices are used where monitored electronic access control is needed. In some cases, Electric Latch Retraction exit devices are installed. For historic...
buildings, where electronic access control is not required, traditional cross bar devices may be used.

Durability is an important component when deciding on the quality of products to be used, especially with such a large and heavily populated campus and the heavy door usage it entails. To illustrate, Burch states that he has key cutting machines that are rebuilt every year. “In a locksmith business, a busy key
Higher Security Planned for Critical Areas

Some doors that require added access control are being equipped with stand-alone, microprocessor-based, battery-powered locks that feature an iButton port, 12-button keypad and a standard mortise cylinder. The lock stores up to 100 codes and allows administrators to easily add or delete users in seconds, right at the keypad.

For areas where even higher security is needed, biometric readers are being installed. These include hand readers on some exterior doors, computer facilities and laboratories. This provides added security for data or equipment and monitors after-hours access. Burch says, “We’re open every day of the year, and we need to be able to control who goes into a facility at 3:00 AM. Our medical labs have cell cultures that are 20 generations away from where they started, and researchers have to be sure they don’t become contaminated and that incubators are working properly.”

The hand readers are used where a fairly large population of users exists. Each hand reader is a complete door controller that provides door lock operation, request for exit, and alarm monitoring. All information, including biometric data and decision-making capability resides locally in the unit, which ensures that the door is secure and will continue to operate properly even if all communications to the main access control computer are lost.

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For specialized laboratories and areas with smaller populations of users, fingerprint readers will be employed. According to Burch, these include Biohazard Level 3 labs, the second highest classification for such facilities. He notes that the Patriot Act mandates that two forms of identification be used for such areas, and the fingerprint gives instant identification of the person, in combination with their card.

Both types of biometric readers provide the audit trail information needed to verify that a specific person was in a given area at a specific time, not just his or her card or other credential.

Burch says the campus is moving toward using wireless technology in some applications, as part of its card access system. The system seamlessly integrates the access control system and the wireless access products into a single, unified access control management database. Burch points out, “With the wireless technology, we don’t have to run conduit, power cable and data cable in older buildings and hide it to meet the university’s appearance standards. We can put it a reader in an elevator to control access to floors without having to hard-wire it.”

**Continued Growth Anticipated**

As the campus continues to grow, Burch sees his department’s mission as ever expanding. He points out that the university has more than 700 acres available and is planning a major expansion, starting over the next five years. An adjacent airport, used by the university to fly medical staff around the state, is being moved to make room for additional buildings. This will require adding to his current staff of 12 people, with additional skills in electronics and data management. The security system has been planned to accommodate this growth. Any additional buildings will incorporate the new high security key system as well as the biometric readers and key management software now being implemented.

**About the Author:** Beverly Vigue, AHC/CDC, is Vice President, Education Solutions at Ingersoll Rand Security Technologies, where she is responsible for developing the vertical education market. Beverly joined Ingersoll Rand in 1999 as Business Development Manager (1999-2000), then led the company’s Safe Schools Program from 2000-2002. She has been in her current position since 2002.