STATE OF NORTH CAROLINA

AUDIT OF THE INFORMATION SYSTEMS

GENERAL CONTROLS

WAKE TECHNICAL COMMUNITY COLLEGE

FEBRUARY 2008

OFFICE OF THE STATE AUDITOR

LESLIE MERRITT, JR., CPA, CFP

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AUDITOR'S TRANSMITTAL

The Honorable Michael F. Easley, Governor
Members of the North Carolina General Assembly
The Board of Directors of Wake Technical Community College
Dr. Steven C. Scott, President

Ladies and Gentlemen:

We have completed our audit of Wake Technical Community College. This audit was conducted during the period from June 21, 2007, through July 12, 2007. The audit was conducted in accordance with *Government Auditing Standards* and *Information Systems Audit Standards*.

The primary objective of this audit was to evaluate information systems (IS) general controls at Wake Technical Community College. The scope of our IS general controls audit included general security, access controls, systems software, physical security, and disaster recovery. Other IS general control topics were reviewed as considered necessary.

This report contains an executive summary and audit results which detail the areas where Wake Technical Community College has performed satisfactorily relevant to our audit scope, where improvements should be made, and where further study is necessary.

We wish to express our appreciation to the staff of Wake Technical Community College for the courtesy, cooperation and assistance provided to us during this audit.

North Carolina General Statutes require the State Auditor to make audit reports available to the public. Copies of audit reports issued by the Office of the State Auditor may be obtained through one of the options listed in the back of this report.

Respectfully submitted,

Leslie W. Merritt, Jr.

Leslie Merritt, Jr., CPA, CFP
State Auditor

TABLE OF CONTENTS

We conducted an Information Systems (IS) audit at the Wake Technical Community College from June 21, 2007, through July 12, 2007. The primary objective of this audit was to evaluate the IS general controls in place during that period. Based on our objective, we report the following conclusions:

General security involves the establishment of a reasonable security program that addresses the general security of information resources. Wake Technical Community College has established a reasonable security program that addresses the general security of information resources. *We did not identify any significant weaknesses in general security during our audit.*

The **access control** environment consists of access control software and information security policies and procedures. We found several weaknesses in access controls. Due to the sensitive nature of the conditions found in these weaknesses, we have conveyed these findings to management in a separate letter pursuant to the provision of North Carolina G.S. 147-64.6(c)(18).

Systems software is the collection of programs that drive the computer. The selection of systems software should be properly approved and the software should be maintained by the computer center. *We did not identify any weaknesses in systems software during our audit.*

Physical security primarily involves the inspection of the agency's computer center for the controls that should reasonably secure the operations of the computer center from foreseeable and preventable threats from fire, water, electrical problems, and vandalism. We did identify a weakness in the physical security. *See Audit Finding 1, Physical Security of the Computer Processing Facility.*

A complete **disaster recovery** plan that is tested periodically is necessary to enable Wake Technical Community College to recover from an extended business interruption due to the destruction of the computer center or other Wake Technical Community College assets. Our audit did identify significant weaknesses in disaster recovery. *See Audit Finding 2, Resumption of Computer Systems.*

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AUDIT OBJECTIVES, SCOPE, AND METHODOLOGY

OBJECTIVES

Under the *North Carolina General Statutes* 147-64.6, the State Auditor is responsible for examining and evaluating the adequacy of operating and administrative procedures and practices, systems of accounting, and other elements of State agencies. IS general control audits are examinations of controls which effect the overall organization and operation of the IS function. This IS audit was designed to ascertain the effectiveness of general controls at Wake Technical Community College.

SCOPE

General controls govern the operation and management of computer processing activities. The scope of our IS general controls audit was to review general security issues, access controls, systems software, physical security, and disaster recovery which directly affect Wake Technical Community College's computing operations. Other IS general control topics were reviewed as considered necessary.

METHODOLOGY

We audited policies and procedures, interviewed key administrators and other personnel, examined system configurations, toured the computer facility, tested on-line system controls, reviewed appropriate technical literature, reviewed computer generated reports, and used security evaluation software in our audit of general controls. We conducted our audit in accordance with the standards applicable to performance audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States and *Information Systems Audit Standards* issued by the Information Systems Audit and Control Association.

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Wake Technical Community College is a public two-year comprehensive postsecondary educational institution that adheres to an open-door policy by offering quality accessible and affordable educational opportunities to all adults regardless of age, sex, socioeconomic status, ethnic origin, race, religion, or disability. The College was chartered on April 3, 1958, as the Wake County Industrial Education Center and operation actually began October 7, 1963. After several dedications and approvals, the name was changed to Wake Technical Community College on December 1, 1987. Wake Technical Community College is located in Raleigh, North Carolina. The mission of Wake Technical Community College is to help improve and enrich lives by meeting the lifelong educational, training, and service needs of its diverse community. To meet the needs of its community, the College focuses on providing support services, resources, community outreach, and partnerships; programs in basic skills development; vocational, technical, and occupational training; and college/university transfer preparation.

The IT division at Wake Technical Community College is referred to as the Information Technology Services division of the College. The Chief Information Officer, who is responsible for the entire computing of Wake Technical Community College, heads the Information Technology Services division. This position reports to the Vice President for Administrative Services. The mission of the Information Technology Services division is to support Student Learning, Faculty Teaching and College Operations through the use of Information Technology. The Information Technology Services philosophy is expressed as "The most important relationship on campus is that between the student and the instructor. Everything else on campus is in support of that relationship".

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The following audit results reflect the areas where Wake Technical Community College has performed satisfactorily and where recommendations have been made for improvement.

GENERAL SECURITY ISSUES

General security issues involve the maintenance of a sound security management structure. A sound security management structure should include a method of classifying and establishing ownership of resources, proper segregation of duties, a security organization and resources, policies regarding access to the computer systems and a security education program. *Our audit did not identify a significant weakness in general security.*

ACCESS CONTROLS

The most important information security safeguard that Wake Technical Community College has is its access controls. The access controls environment consists of Wake Technical Community College's access control software and information security policies and procedures. An individual or a group with responsibility for security administration should develop information security policies, perform account administration functions and establish procedures to monitor and report any security violations. We noted a number of weaknesses in access controls. Due to the sensitive nature of the conditions found in the weaknesses, we have conveyed these findings to management in a separate letter pursuant to the provision of North Carolina G.S. 147-64.6(c)(18).

SYSTEMS SOFTWARE

Systems software is the collection of programs that the computer center uses to run the computer and support the application systems. This software includes the operating system, utility programs, compilers, database management systems and other programs. The systems programmers have responsibility for the installation and testing of upgrades to the system software when received. Systems software changes should be properly documented and approved. *Our audit did not identify a significant weakness in system software.*

PHYSICAL SECURITY

Controls over physical security are designed to protect a computer center from service interruptions resulting from fire, water, electrical problems, vandalism, and other causes. Wake Technical Community College's physical security controls ensure that the computer service center is reasonably secure from foreseeable and preventable threats to its physical continuity. Our audit did identify a weakness in physical security.

AUDIT FINDING 1: PHYSICAL SECURITY OF THE COMPUTER PROCESSING FACILITY

The computer room is not reasonably secure from foreseeable and preventable threats to its physical continuity. We found the following physical security weakness:

- Wake Technical Community College's computer room is not restricted to the appropriate staff members as needed. Over 40 staff members were assigned a Grand Master Key which gave access to the computer room.

Appropriate physical security and access control measures should be established for computer processing facilities in conformity with the general security policy. Access should be restricted to individuals who have been authorized to gain such access. Management should also assure that sufficient measures are put in place and maintained for protection against environmental factors (e.g. fire, dust, power, excessive heat and humidity).

Recommendation: Wake Technical Community College should develop procedures to ensure that the computer room is always secure from unauthorized personnel. Wake Technical Community College should ensure access to the computer area is properly restricted to only those employees that need access to perform their job duties.

Auditee's Response:

Wake Technical Community College has made plans to install an electronic security lock device that contains a re-keyed core. This will ensure that only the appropriate IT Staff have unaccompanied access into the computer room.

DISASTER RECOVERY

Disasters such as fire and flood can destroy a computer service center and leave its users without computer processing support. Without computer processing, many College services would grind to a halt. To reduce this risk, computer service centers develop disaster recovery plans. Disaster recovery procedures should be tested periodically to ensure the recoverability of the data center. Our audit did identify significant weaknesses in disaster recovery.

AUDIT FINDING 2: RESUMPTION OF COMPUTER SYSTEMS

Wake Technical Community College has a disaster recovery plan to ensure the resumption of computer systems during adverse circumstances. However, the disaster recovery plan is incomplete. The plan is missing the following components:

- Executive management's signature of approval of the plan.

- Alternate user department procedures to manage their workloads until processing resumes.
- A copy of the plan is not stored in a secure offsite facility.

In the event of a disaster, the aforementioned components are necessary to ensure the proper recovery of the computer resources. In addition, a disaster recovery plan should be tested to ensure that the plan is effective. Management should ensure that a written plan is developed and maintained in accordance with the overall framework for restoring critical information services in the event of a major failure. The disaster recovery plan should minimize the effect of disruptions. Procedures should require that the plan be reviewed and revised annually or when significant changes to the college's operations occur.

Recommendation: Wake   Technical   Community   College   should   include   all   the aforementioned critical components in their plan and should store the plan in a secure offsite facility.

Auditee's Response:

Wake Tech has already satisfied the recommendation for this finding, as follows:

- The Wake Technical Community College Executive Vice President has referred the completed plan to our legal counsel. After review by counsel, the plan will be forwarded to the College President for approval.

- "Alternate user department procedures" were later clarified by Auditor Johnson as an alternate data center from which we can run mission-critical applications. Although we do not currently have an alternate data center, we have plans to build one at our Health Sciences Campus. In addition, we have the option of using facilities at the North Carolina Community College System in the case of the unavailability of our current data center.

- Both printed and electronic copies of the plan are now stored at the secure off-site vault.

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