



STATE OF NORTH CAROLINA

AUDIT OF THE INFORMATION SYSTEMS

GENERAL CONTROLS

CLEVELAND COMMUNITY COLLEGE

AUGUST 2007

OFFICE OF THE STATE AUDITOR

LESLIE MERRITT, JR., CPA, CFP

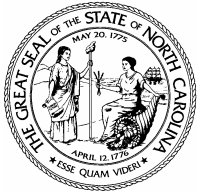
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State Auditor

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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 Cleveland Community College
Dr. L. Steve Thornburg, President

Ladies and Gentlemen:

We have completed our audit of Cleveland Community College. This audit was conducted during the period from June 11, 2007, through July 26, 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 Cleveland 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 Cleveland 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 Cleveland 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,

A handwritten signature in cursive script that reads "Leslie W. Merritt, Jr.".

Leslie Merritt, Jr., CPA, CFP
State Auditor

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EXECUTIVE SUMMARY

We conducted an Information Systems (IS) audit at the Cleveland Community College from June 11, 2007, through July 26, 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. Cleveland Community College has established a reasonable security program that addresses the general security of information resources. We did identify a significant weakness in general security during our audit. *See Audit Finding 1, IT Security Policies and Procedures.*

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 significant 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 not identify any significant weaknesses in systems software during our audit.*

A complete **disaster recovery** plan that is tested periodically is necessary to enable Cleveland Community College to recover from an extended business interruption due to the destruction of the computer center or other Cleveland Community College assets. Our audit did note a weakness 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 Cleveland 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 Cleveland 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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BACKGROUND INFORMATION

Cleveland Community College, a public two-year college and a member institution of the North Carolina Community College System, is located in Shelby, North Carolina. It was established in 1965 by and for the people of Cleveland County and is accredited by the Southern Association of Colleges and Schools to award associate degrees. The College offers Associate in Arts, Associate in Science, and Associate in Applied Science degrees. It also offers diplomas, certificates, adult high school diplomas, GEDs, and continuing education courses.

The College's mission is threefold: (1) to help students achieve professional and personal goals by providing quality, accessible education programs and services, (2) to serve as an agent for economic development by responding to the educational and training needs of business and industry, and (3) to contribute to the improvement of the quality of life in Cleveland County by actively participating in collaborative community initiatives.

The IT division at Cleveland Community College is referred to as the Information Systems division of the College. The Information System division consists of a Director, System Administrator, Network Administrator, and Network Specialist. The Director reports to the Vice President of Finance and Administrative Services. The mission of the Information Systems division is to support and administer the computers of the College. The function of the Information Systems division is to recommend software and equipment, obtain bids, and help order software and equipment for users, set up equipment and network items that need connecting, repair equipment as needed, maintain all software and equipment, maintain the network and operating system software, provide security of both systems and individual machines through firewall protection and antivirus software, and monitor usage of the computer systems.

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AUDIT RESULTS AND AUDITEE RESPONSES

The following audit results reflect the areas where Cleveland 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.

AUDIT FINDING 1: IT SECURITY POLICIES AND PROCEDURES

Cleveland Community College has not adopted formal information technology (IT) standards to help them address all critical areas of their IT security environment. The following critical policies and procedures were not addressed in their security program:

- Cleveland Community College does not monitor its current system configuration against an approved baseline for system security that will assist the College in identifying unauthorized changes to the system. Without a baseline configuration for securing the critical operating system, the operating system may not be secure from commonly known vulnerabilities.

Cleveland Community College should assume full responsibility for developing a framework policy, which establishes the organization's overall approach to security and internal control. The policy should comply with overall business objectives and be aimed at decreasing risks through preventive measures, timely identification of irregularities, limitation of losses and timely restoration.

Recommendation: Cleveland Community College should develop an approved baseline for system security. North Carolina Community College System (NCCCS) is in the process of developing a baseline configuration that is scheduled for completion in July 2007. Cleveland Community College should use the completed NCCCS baseline as a guideline for minimum security configurations, and document any differences between the college's baseline and the NCCCS baseline. Cleveland Community College should develop procedures to monitor their system configuration against the college's developed baseline settings to detect any unauthorized changes to the system.

Auditee's Response: Cleveland Community College will use the NCCCS baseline as a guideline for security configuration. Cleveland Community College will develop procedures to monitor the system to detect any unauthorized changes to the system.

AUDIT RESULTS AND AUDITEE RESPONSES (CONTINUED)

ACCESS CONTROLS

The most important information security safeguard that Cleveland Community College has is its access controls. The access controls environment consists of Cleveland 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 any significant weaknesses 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. The physical security controls ensure that the computer service center is reasonably secure. *Our audit did not identify any significant weakness in physical security.*

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 identified one significant weakness in the disaster recovery planning.

AUDIT FINDING 1: RESUMPTION OF COMPUTER SYSTEMS

Cleveland Community College does not have an approved disaster recovery plan to ensure the resumption of computer systems during adverse circumstances. Cleveland Community College does have a draft disaster recovery plan, which is incomplete. The plan does not include the following critical components:

AUDIT RESULTS AND AUDITEE RESPONSES (CONCLUDED)

- Executive management's signature of approval of the plan.
- Statement of the assumptions, such as the maximum time without computing, underlying the plan.
- Identification of critical applications in each user department and the priority in which these applications will be restored if resources are limited.
- Identification of key personnel and their assignments during the restoration of processing.
- Alternate user department procedures to manage their workloads until processing resumes.
- An inventory of equipment, special stock and arrangements to acquire replacement equipment.
- A procedure to update the plan when there are major changes to the environment or at least annually.

In the event of a disaster, the aforementioned components are necessary to ensure the proper recovery of the computer resources. Also, 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: Cleveland Community College should officially approve the draft disaster recovery plan, include the aforementioned critical components in to their plan and should test the plan at least on a yearly basis.

Auditee's Response: Cleveland Community College will develop a written disaster recovery plan to be tested on a yearly basis and approved by Management.

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ORDERING INFORMATION

Audit reports issued by the Office of the State Auditor can be obtained from the web site at www.ncauditor.net. Also, parties may register on the web site to receive automatic email notification whenever reports of interest are issued. Otherwise, copies of audit reports may be obtained by contacting the:

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