



STATE OF NORTH CAROLINA

AUDIT OF THE INFORMATION SYSTEMS

GENERAL CONTROLS

ROWAN-CABARRUS COMMUNITY COLLEGE

JULY 2007

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 Rowan-Cabarrus Community College
Dr. Richard L. Brownell, President

Ladies and Gentlemen:

We have completed our audit of Rowan-Cabarrus Community College (RCCC). This audit was conducted during the period from May 30, 2007, through June 27, 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 RCCC. 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 RCCC 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 RCCC 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 Rowan-Cabarrus Community College (RCCC) from May 30, 2007, through June 27, 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. RCCC 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 physical security during our audit.*

A complete **disaster recovery** plan that is tested periodically is necessary to enable RCCC to recover from an extended business interruption due to the destruction of the computer center or other RCCC 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 Rowan-Cabarrus 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 Rowan-Cabarrus 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

Rowan-Cabarrus Community College is a comprehensive, multi-campus community college with a North Campus located in Salisbury, North Carolina and a South Campus located in Concord, North Carolina. Rowan-Cabarrus Community College first opened for class in 1963. The Southern Association of Colleges and Schools accredits Rowan-Cabarrus Community College to award associate degrees, certificates, and diplomas. Rowan-Cabarrus Community College is open door, comprehensive community-based institution of higher learning serving the citizens of Rowan and Cabarrus counties. The College strives to inspire adults in the service area to increase their knowledge, develop occupational proficiencies, respond to lifelong learning opportunities, and participate as responsible citizens in a democratic society.

The IT division at Rowan-Cabarrus Community College is referred to as Technical Services. The Associate Vice President of Technical Services heads this division and reports to the Vice President Administrative Services and Chief Fiduciary Officer. The Technical Services Department of Rowan-Cabarrus Community College provides network, administrative data, telephone, computer installation/maintenance, and telecommunications services. The department manages the College's local and wide areal networks and peripherals, corporate web and e-mail servers, online student support services, the virtual campus, and administrative data delivery systems.

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AUDIT RESULTS AND AUDITEE RESPONSES

The following audit results reflect the areas where RCCC 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

Rowan-Cabarrus Community College (RCCC) 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:

- RCCC 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.

RCCC 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: Rowan-Cabarrus 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. RCCC 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. RCCC 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: Concur: We will continue to work with the North Carolina Community College System to develop and implement a comprehensive baseline document for system security. Upon receipt of the approved NCCCS baseline, we will insure any differences or exceptions to account for local operational requirements are accurately documented.

AUDIT RESULTS AND AUDITEE RESPONSES (CONTINUED)

ACCESS CONTROLS

The most important information security safeguard that RCCC has is its access controls. The access controls environment consists of RCCC'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 from foreseeable and preventable threats to its physical continuity. *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.

AUDIT FINDING 2: RESUMPTION OF COMPUTER SYSTEMS

Rowan-Cabarrus 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 does not include the following critical components:

- Identification of critical applications in each user department and the priority in which these applications will be restored if resources are limited.

AUDIT RESULTS AND AUDITEE RESPONSES (CONCLUDED)

- Alternate user department procedures to manage their workloads until processing resumes.
- An inventory of equipment, special stock and arrangements to acquire replacement equipment.
- The Disaster Recovery Plan is not located in an offsite storage location.

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 operation occur.

Recommendation: Rowan-Cabarrus Community College should include all the aforementioned critical components in their plan and should test the plan at least on a yearly basis.

Auditee's Response: Concur. The current Disaster Recovery Plan focuses on the college level critical applications. Individual departments typically access the college systems. Generally, individual departments use standard business applications. The plan will be expanded to include special department level applications where they exist. A system wide inventory is in progress and the results will be included in the plan. A copy of the current plan is now located with the offsite backup tapes.

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