



STATE OF NORTH CAROLINA

AUDIT OF THE INFORMATION SYSTEMS

GENERAL CONTROLS

ROANOKE-CHOWAN COMMUNITY COLLEGE

SEPTEMBER 2007

OFFICE OF THE STATE AUDITOR

LESLIE MERRITT, JR., CPA, CFP

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Leslie Merritt, Jr.,
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State Auditor

STATE OF NORTH CAROLINA
Office of the State Auditor

2 S. Salisbury Street
20601 Mail Service Center
Raleigh, NC 27699-0601
Telephone: (919) 807-7500
Fax: (919) 807-7647
Internet <http://www.osa.state.nc.us>

AUDITOR'S TRANSMITTAL

The Honorable Michael F. Easley, Governor
Members of the North Carolina General Assembly
The Board of Directors of Roanoke-Chowan Community College
Dr. Ralph G. Soney, President

Ladies and Gentlemen:

We have completed our audit of Roanoke-Chowan Community College. This audit was conducted during the period from June 29, 2007, through August 3, 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 Roanoke-Chowan 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 Roanoke-Chowan 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 Roanoke-Chowan 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 Roanoke-Chowan Community College from June 29, 2007, through August 3, 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. Roanoke-Chowan 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 Roanoke-Chowan Community College to recover from an extended business interruption due to the destruction of the computer center or other Roanoke-Chowan Community College assets. Our audit did note 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 Roanoke-Chowan 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 Roanoke-Chowan 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

Roanoke-Chowan Community College, located in Ahoskie, North Carolina, was founded in 1967. The Southern Association of Colleges and Schools accredits Roanoke-Chowan Community College to award associate in arts, associate in science, associate in applied science, and associate in general education degrees, as well as certificates and diplomas. As a member of the North Carolina Community College System, the mission of Roanoke-Chowan Community College is to provide educational opportunities for all constituent individuals and groups commensurate with their needs, interests, and abilities. These educational opportunities are designed to minimize barriers to post-secondary education and to enhance the quality of life for individuals and groups seeking to improve their lives and well being. The College provides comprehensive life-long learning opportunities in the following areas: basic education and literacy improvement; occupational and workforce education, training and retraining; quality academic education; services to communities which enrich the lives of citizenry; and services to individuals, businesses, and industries to support economic growth and development.

The computer services division is referred to as Information Technology Services. A Coordinator heads Information Technology Services, and this position reports to the Dean of Finance and Administration. The mission of Information Technology Services is to provide a total source, single-point resource for computer support at Roanoke-Chowan Community College. The function of Information Technology Services is to provide support for the computing and network resources in accordance with the mission of the College.

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AUDIT RESULTS AND AUDITEE RESPONSES

The following audit results reflect the areas where Roanoke-Chowan 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

Roanoke-Chowan 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:

- Roanoke-Chowan 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.

Roanoke-Chowan 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: Roanoke-Chowan 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. Roanoke-Chowan 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. Roanoke-Chowan 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: We agree with the findings. We have obtained a copy of the suggested baseline configuration for minimum security and will adjust and document changes accordingly.

AUDIT RESULTS AND AUDITEE RESPONSES (CONTINUED)

ACCESS CONTROLS

The most important information security safeguard that Roanoke-Chowan Community College has is its access controls. The access controls environment consists of Roanoke-Chowan 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 several 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 weaknesses 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

Roanoke-Chowan 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:

AUDIT RESULTS AND AUDITEE RESPONSES (CONCLUDED)

- Executive management has not signed off on the disaster recovery plan.
- Roanoke-Chowan Community College has not tested recovery of Colleague Information System UNIX Box.

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: Roanoke-Chowan Community College should include all the aforementioned critical components in its plan and should test the plan at least on a yearly basis.

Auditee's Response: We agree with the findings. We will update our disaster recovery plan and obtain needed executive management signatures. We also will attempt to secure needed resources to perform a test recovery without jeopardizing our production server.

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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:

Office of the State Auditor
State of North Carolina
2 South Salisbury Street
20601 Mail Service Center
Raleigh, North Carolina 27699-0601

Telephone: 919/807-7500

Facsimile: 919/807-7647