STATE OF NORTH CAROLINA

AUDIT OF THE INFORMATION SYSTEMS

GENERAL CONTROLS

BLUE RIDGE 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 Blue Ridge Community College
Dr. Molly Parkhill, Interim President

Ladies and Gentlemen:

We have completed our audit of Blue Ridge Community College (BRCC). This audit was conducted during the period from May 4, 2007, through June 8, 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 BRCC. 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 BRCC 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 BRCC 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

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EXECUTIVE SUMMARY

We conducted an Information Systems (IS) audit at the Blue Ridge Community College (BRCC) from May 4, 2007, through June 8, 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 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. BCCC has established a reasonable security program that addresses the general security of information resources. Our audit did not identify any significant weaknesses in general security.

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 BRCC to recover from an extended business interruption due to the destruction of the computer center or other BRCC assets. We found a significant weakness in disaster recovery. See Audit Finding 1: 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 BRCC.

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 BRCC'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

Blue Ridge Community College, located in Flat Rock, NC, was founded in 1969. The Southern Association of Colleges and Schools accredits Blue Ridge Community College to award degrees, certificates, and diplomas. It received its initial accreditation in 1973. The College offers more than 80 degree, diploma, and certificate curriculum programs. The College also offers a wide array of occupational, academic, and vocation programs. The mission of Blue Ridge Community College is to enrich the lives of the citizens in the surrounding community through education, training, and cultural activities.

The Information Technology department is part of the Technology and Development division of Blue Ridge Community College. The director of Information Technology heads this department and reports to the Dean of Technology and Development. The function of the Information Technology department is to install and maintain all of the computers, peripheral equipment, and software for Blue Ridge Community College. The mission of the Information Technology department is to provide the tools that enhance access to knowledge and communication, guide the process of development, planning, and research, and deliver accurate and timely information to the people served by Blue Ridge Community College.

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The following audit results reflect the areas where BRCC 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. BRCC has established a reasonable security program that addresses the general security of information resources. Our audit did not identify any significant weaknesses in general security.

ACCESS CONTROLS

The most important information security safeguard that BRCC has is its access controls. The access controls environment consists of BRCC'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. BRCC'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 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 1: RESUMPTION OF COMPUTER SYSTEMS

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

- 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: Blue Ridge 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: Blue Ridge Community College is actively developing a Business Continuity/Disaster Recovery Plan. The individual units of the College have already identified the critical applications, their priority, the key personnel, mitigation and recovery processes, equipment and the associated costs required to resume normal functions. It is the goal of the team developing this document to include a regular review, update and testing process and submit the completed document to the Management Team (the College President and Deans) for their approval.

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