



STATE OF NORTH CAROLINA

AUDIT OF THE INFORMATION SYSTEM GENERAL CONTROLS

AT

PAMLICO COMMUNITY COLLEGE

GRANTSBORO, NORTH CAROLINA

JUNE 2004

OFFICE OF THE STATE AUDITOR

RALPH CAMPBELL, JR.

STATE AUDITOR

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Ralph Campbell, Jr.
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 Pamlico Community College
Dr. Francis Marion Altman, Jr., President

Ladies and Gentlemen:

We have completed our information systems (IS) audit of Pamlico Community College. The audit was conducted in accordance with *Government Auditing Standards* and *Information Systems Audit Standards*.

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

This report contains an executive summary that highlights the areas where Pamlico Community College has performed satisfactorily and where improvements should be made.

We wish to express our appreciation to the staff at Pamlico 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 'Ralph Campbell, Jr.'.

Ralph Campbell, Jr.
State Auditor

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EXECUTIVE SUMMARY

We conducted an information system (IS) audit at Pamlico Community College (CC) from April 4, 2003 - April 30, 2004. 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. We found that NCCCS and Pamlico Community College (CC) management should develop and adopt a baseline configuration for the operating system and Pamlico CC should perform a risk assessment. *See Audit Finding 1, Risk Assessment and Baseline Configuration.*

The **access control** environment consists of access control software and information security policies and procedures. We reviewed the access controls for Pamlico Community College's critical operating systems. We found several weaknesses in access controls. Due to the sensitive nature of the conditions found, we have conveyed these findings to management in a separate letter pursuant to the provision of *North Carolina General Statute 147-64.6(c)(18)*.

Program maintenance primarily involves enhancements or changes needed to existing systems. Because the same procedures are used to patch and upgrade the critical application and the operating system, we indirectly tested program changes to the critical application in our test of system software maintenance.

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 found a significant weakness in systems software maintenance. Due to the sensitive nature of the condition found, we have conveyed this finding to management in a separate letter pursuant to the provision of *North Carolina General Statute 147-64.6(c)(18)*.

Physical security primarily involves the inspection of the College'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. Pamlico Community College computer center is secure from foreseeable and preventable security and environmental threats. *We did not find any significant weaknesses in physical security.*

A complete **disaster recovery** plan that is tested periodically is necessary to enable the College to recover from an extended business interruption due to the destruction of the computer center or other College assets. Pamlico Community College's disaster recovery plan is adequate to ensure resumption of computer systems in a timely manner during adverse circumstances. *We did not find any significant weaknesses in disaster recovery.*

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AUDIT OBJECTIVES, SCOPE, AND METHODOLOGY

OBJECTIVES

Under the *North Carolina General Statutes* Chapter 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. This IS audit was designed to ascertain the effectiveness of general controls at Pamlico 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, program maintenance, systems software, physical security, operations procedures, and disaster recovery which directly affect Pamlico Community College computing operations. Other IS general control topics were reviewed as considered necessary.

METHODOLOGY

We audited policies and procedures, used questionnaires to interview key administrators and other personnel, developed a program to generate information from the critical operating systems to examine 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 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.¹

¹ In 1992 the State created the Information Resource Management Commission to provide statewide coordination of information technology resources planning. The IRMC provides state enterprise IT leadership including increased emphasis and oversight for strategic information technology planning and management; policy development; technical architecture; and project certification. Pursuant to *North Carolina General Statute* 147-33.78 numerous state officials serve on the IRMC including four members of the Council of State who are appointed by the Governor. The State Auditor has been appointed a member of the IRMC and elected as chair of the IRMC by its members.

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BACKGROUND INFORMATION

Pamlico Community College, located in Grantsboro, North Carolina, was founded October 1962 and received accreditation from the Southern Association of Colleges and Schools in 1967. The College was recently re-accredited in December 2002. The goal of Pamlico Community College is to provide accessible and affordable quality education, relevant training, and lifelong learning opportunities for the people served by the College.

Pamlico Community College offers an Associate in Applied Science degree, Associate in Arts degree, and Associate in General Education. The College also provides curriculum programs for certificate, diploma, and terminal Applied Science degrees and transfer options through the Associate in Arts degree. Continuing Education programs provide short-term occupational extension training, vocational courses, and basic skills with the focus on services to businesses, groups, and individuals that improve the quality of life.

The System Administrator, who reports directly to the Vice President of Administrative Services, heads the Computer Services department of Pamlico Community College. The mission of the Computer Services department is to provide a total source, single point resource for computer support at Pamlico Community College. This is accomplished by breaking the department into two separate sections: Administrative Computer Support and Instructional Computer support. The Computer Services department is governed by the goals and requirements set forth in the Computer Services Operations manual and in accordance with the mission of the College. The function of the Computer Services department is to provide administrative and instructional support for the College to allow for the most effective, efficient and economical utilization of computer systems while at the same time providing protection of equipment and data.

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AUDIT RESULTS AND AUDITEE RESPONSES

The following audit results reflect the areas where Pamlico 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: RISK ASSESSMENT AND BASELINE CONFIGURATION

In order to establish an effective security structure, certain key components should be in place. The following key components were not addressed in Pamlico Community College's (CC) security program:

- Pamlico CC also has not performed a risk assessment of their critical operations. Without a risk assessment, management has not determined which areas are deemed critical and how to prioritize resources and time to ensure that the critical areas remain effective.
- NCCCS has not provided Pamlico CC with a baseline configuration for securing the critical operating system. The critical operating system may not be secure from common vulnerabilities.

Pamlico CC's management should perform a risk assessment to clarify which operations are critical, so these operations can remain effective. In addition, NCCCS and Pamlico CC's management should develop a baseline configuration for the critical operating system to ensure that the organization's overall approach to security and internal control is implemented on the critical operating system.

Recommendation: Pamlico CC's management need perform a risk assessment. Also, management at Pamlico CC needs to work with NCCCS to develop and adopt a baseline configuration for the operating system.

Auditee's Response: Pamlico CC will perform the required risk assessment. The recommendations offered by this audit offer a fresh and welcome perspective towards enhancing security and will be addressed, since they offer good improvements to our system's security. We have, and will continue to discuss security improvements with NCCCS in an effort to develop a baseline configuration that will comply with this audit's recommendation.

AUDIT RESULTS AND AUDITEE RESPONSES (CONTINUED)

ACCESS CONTROLS

The access control environment consists of 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 reviewed the access controls for Pamlico Community College's critical operating systems. We found several significant weaknesses in access controls. Due to the sensitive nature of the conditions found, we have conveyed these findings to management in a separate letter pursuant to the provision of *North Carolina General Statute 147-64.6(c)(18)*.

PROGRAM MAINTENANCE

Program maintenance consists of making changes to existing application systems. Programmers should follow program change procedures to ensure that changes are authorized, made according to specifications, properly tested, and thoroughly documented. Application programmers should be restricted to a test environment to ensure that all changes to production resources are tested and approved before moving the changes into production. Changes to application system production programs should be logged and monitored by management. Because the same procedures are used to patch and upgrade the critical application and the operating system, we indirectly tested program changes to the critical application in our test of system software maintenance.

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. We found a significant weakness in systems software maintenance. Due to the sensitive nature of the condition found, we have conveyed this finding to management in a separate letter pursuant to the provision of *North Carolina General Statute 147-64.6(c)(18)*.

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. Pamlico Community College computer center is secure from foreseeable and preventable security and environmental threats. *We did not find any significant weaknesses in physical security.*

AUDIT RESULTS AND AUDITEE RESPONSES (CONCLUDED)

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. Pamlico Community College's disaster recovery plan is adequate to ensure resumption of computer systems in a timely manner during adverse circumstances. *We did not find any significant weaknesses in disaster recovery.*

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DISTRIBUTION OF AUDIT REPORT

In accordance with General Statutes 147-64.5 and 147-64.6(c)(14), copies of this report have been distributed to the public officials listed below. Additional copies are provided to other legislators, state officials, the press, and the general public upon request.

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The Honorable Beverly M. Perdue	Lieutenant Governor of North Carolina
The Honorable Richard H. Moore	State Treasurer
The Honorable Roy A. Cooper, III	Attorney General
Mr. David T. McCoy	State Budget Officer
Mr. Robert L. Powell	State Controller
Mr. Martin Lancaster	President
	The North Carolina Community College System
Dr. Francis Marion Altman, Jr.	President, Pamlico Community College

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