



# **STATE OF NORTH CAROLINA**

**AUDIT OF THE INFORMATION SYSTEMS**

**GENERAL CONTROLS**

**THE UNIVERSITY OF NORTH CAROLINA AT WILMINGTON**

**WILMINGTON, NORTH CAROLINA**

**JUNE 2006**

**OFFICE OF THE STATE AUDITOR**

**LESLIE W. MERRITT, JR., CPA, CFP**

**STATE AUDITOR**

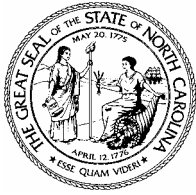
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STATE OF NORTH CAROLINA  
Office of the State Auditor

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**AUDITOR'S TRANSMITTAL**

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The Honorable Michael F. Easley, Governor  
Members of the North Carolina General Assembly  
The Board of Directors of The University of North Carolina at Wilmington  
Dr. Rosemary DePaolo, Chancellor

Ladies and Gentlemen:

We have completed our information systems (IS) audit of The University of North Carolina at Wilmington (UNCW). This audit was conducted from October 24, 2005 through January 13, 2006. 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 UNCW. The scope of our IS general controls audit included general security, access controls, program maintenance, system development, systems software, physical security, operations procedures, 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 UNCW has performed satisfactorily relevant to our audit scope, where improvements should be made, and where further study is necessary.

We wish to express our sincere appreciation to the staff of The University of North Carolina at Wilmington for the exceptional 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 W. Merritt, Jr., CPA, CFP  
State Auditor

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## EXECUTIVE SUMMARY

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We conducted an Information Systems (IS) audit at The University of North Carolina at Wilmington (UNCW) from October 24, 2005 through January 13, 2006. 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. 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 noted 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 the *North Carolina General Statute 147-64.6(c)(18)*.

**Program maintenance** primarily involves enhancements or changes needed to existing systems. Our audit did not identify any significant weaknesses in program 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. Our audit did not identify any significant weaknesses in systems software.

**Systems development** includes the creation of new application systems or significant changes to existing systems. Systems development projects can be expensive and affect the operations of the university in significant ways. Consequently, the university should have a strategic or master plan for systems development. Each development project should be managed using project management techniques and should adhere to a clearly defined systems development methodology. When a project is completed, the finished product should include a comprehensive set of documentation so that the users, operators and programmers each have the information they need to do their jobs. Our audit did not identify any significant weaknesses in systems development.

**Physical security** primarily involves the inspection of the university'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. Our audit did not identify any significant weaknesses in physical security. The **operations procedures** of the computer center include all of the activities associated with running application systems for users. Our audit did not identify any significant weaknesses in operations procedures.

A complete **disaster recovery** plan that is tested periodically is necessary to enable The University of North Carolina at Wilmington to recover from an extended business interruption due to the destruction of the computer center or other university assets. Our audit did not identify any significant weaknesses in disaster recovery.

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## AUDIT OBJECTIVES, SCOPE, AND METHODOLOGY

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### 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 The University of North Carolina at Wilmington.

### 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, system development, physical security, operations procedures, and disaster recovery which directly affect UNCW'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 information systems. 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**

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The University of North Carolina at Wilmington (UNCW) is a public State assisted institution located in Wilmington, North Carolina. Founded as Wilmington College in 1947, the University offers a wide range of undergraduate and master's degree programs, as well as a cooperative doctoral program in marine science. The University's continuing focus is on teaching, expanding basic and applied research activities, and meeting the public service needs of southeastern North Carolina.

The **Information Technology Systems Division** at The University of North Carolina at Wilmington is committed to ensuring that students, faculty and staff have full access to the power of information technologies. The University has taken the unique step of aligning its primary IT resources under the coordination of this newly created division. This division was formulated in July of 1999 and is made up of the following departments.

### **Department of Application Services**

The mission of Application Services is to provide the information infrastructure that supports the University's missions of instruction, research, and public service. Application Services enables the University's teachers, researchers, managers, and staff to carry out their responsibilities, and to do so effectively and efficiently. The Department provides a full range of development and maintenance services including systems analysis, programming, and ongoing technical support and liaison to the administrative departments and the administrative functions of the academic departments of the University.

### **Department of AV/Media Services**

The Department of Audiovisual/Media Services provides audiovisual equipment and technical support for services that are too expensive or technical for departments to provide.

### **Department of Client Services**

The Department of Client Services is responsible for the planning and delivery of personal computer technology and support services to the campus community. These services include Help Desk/User Support for initial problem reporting and resolution, desktop software training and support, personal computer maintenance and support, management of the student computing labs, and instructional and research support. Technology and services provided by this group enables faculty, staff and students to utilize efficiently and effectively UNCW's information technology resources for teaching, research, public service, and information management. This unit works integrally with allied units such as the Center for Teaching Excellence, and maintains close working relationships with IT support staff in other departments.

### **Department of Computing Services**

The Department of Computing Services is responsible for the planning, installation, management and support of the campus-wide computing and data network infrastructure. This infrastructure enables faculty, staff and students to utilize efficiently and effectively UNCW's information technology resources for teaching, research, public service, and information management. The staff also provides specialty ordering and networking capabilities, technical assistance with computer lab wiring, and network equipment configurations.

## **BACKGROUND INFORMATION (CONCLUDED)**

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### **Department of Telecommunications**

The Telecommunications Department has the general responsibility for managing and supporting the campus telephone system and the communications infrastructure wiring plant, both building and underground. Additionally, it has supporting responsibilities for the planning, and in some cases installation, of communications networks in new and existing buildings; working with architects to develop drawings of communications needs; and to produce auto cad drawings when requested for offices within buildings. Other services include alarm system wiring, campus-wide facility access readers, and HVAC and fire systems wiring. Services are provided through a combination of staff resources and contractual arrangements for both outside vendors and the UNCW Physical Plant. The Telecommunications Department is staffed by a wide variety of technical, administrative and customer support personnel, including skilled telecommunications analysts and technicians, cabling designers, telecommunications center systems administrators and operators, and related supervisory and administrative personnel.

## **CURRENT AUDIT RESULTS AND AUDITEE RESPONSES**

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The following audit results reflect the areas where UNCW 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. The University of North Carolina at Wilmington has established a reasonable security program that addresses the general security of information resources.

### **ACCESS CONTROLS**

The most important information security safeguard that UNCW has is its access controls. The access controls 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. During our audit, we noted network architecture controls that strengthen the control environment at the university. However, we also found 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 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. Our audit did not identify any significant weakness in program 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. Systems software changes should be properly documented and approved. Our audit did not identify any significant weaknesses in systems software.

## **CURRENT AUDIT RESULTS AND AUDITEE RESPONSES (CONCLUDED)**

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### **SYSTEMS DEVELOPMENT**

Systems development includes the creation of new application systems or significant changes to existing systems. Systems development projects can be expensive and affect the operations of the university in significant ways. Consequently, the university should have a strategic or master plan for systems development. Each development project should be managed using project management techniques and should adhere to a clearly defined systems development methodology. When a project is completed, the finished product should include a comprehensive set of documentation so that the users, operators and programmers each have the information they need to do their jobs. Our audit did not identify any significant weaknesses in systems development.

### **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. 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 weaknesses in physical security.

### **OPERATIONS PROCEDURES**

The operations of the computer center include all of the activities associated with running application systems for users. Procedures should be in place to control the scheduling and running of production jobs, restarting production jobs when problems occur, storing, handling and mounting of tapes, and maintaining computer equipment. Our audit did not identify any significant weaknesses in operations procedures.

### **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 university 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 did not identify any significant weaknesses in disaster recovery.

# DISTRIBUTION OF AUDIT REPORT

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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 Richard H. Moore  
The Honorable Roy A. Cooper, III  
Mr. David T. McCoy  
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Mr. Lynn Muchmore

Director, Fiscal Research Division

June 6, 2006

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