



# **STATE OF NORTH CAROLINA**

**AUDIT OF THE INFORMATION SYSTEMS**

**GENERAL CONTROLS**

**NC SCHOOL OF THE ARTS**

**WINSTON-SALEM, NORTH CAROLINA**

**MAY 2005**

**OFFICE OF THE STATE AUDITOR**

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

**STATE AUDITOR**

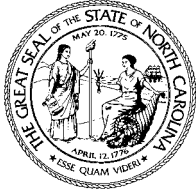
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STATE OF NORTH CAROLINA  
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Auditor**

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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 NC School of the Arts  
Mr. Wade Hobgood, Chancellor

Ladies and Gentlemen:

We have completed our information systems (IS) audit of North Carolina School of the Arts (NCSA). This audit was conducted from January 5, 2005, through February 9, 2005. 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 NCSA. The scope of our IS general controls audit included general security, access controls, program maintenance, systems software, systems development, 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 NCSA 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 NCSA 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 W. Merritt, Jr., CPA, CFP  
State Auditor

## TABLE OF CONTENTS

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	PAGE
EXECUTIVE SUMMARY .....	1
AUDIT OBJECTIVES, SCOPE, AND METHODOLOGY .....	3
BACKGROUND INFORMATION .....	5
AUDIT RESULTS AND AUDITEE RESPONSES .....	7
DISTRIBUTION OF AUDIT REPORT.....	9

## EXECUTIVE SUMMARY

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We conducted an Information Systems (IS) audit at North Carolina School of the Arts (NCSA) from January 5, 2005, through February 9, 2005. 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 *North Carolina General Statutes* 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 agency in significant ways. Consequently, the agency 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 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. Our audit did not note any significant weaknesses in physical security.

## EXECUTIVE SUMMARY (CONCLUDED)

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The **operations procedures** of the computer center include all of the activities associated with running application systems for users. Our audit did not note any significant weaknesses in operations procedures.

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

## AUDIT OBJECTIVES, SCOPE, AND METHODOLOGY

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### 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. IS general control audits are examinations of controls which affect the overall organization and operation of the IS function. This IS audit was designed to ascertain the effectiveness of general controls at NCSA.

### 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, systems development, physical security, operations procedures, and disaster recovery which directly affect NCSA's computing operations.

### 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 security 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**

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The North Carolina School of the Arts is a specialized institution, offering programs at the secondary and baccalaureate levels in dance, design and production, drama, film, and music, and at the master's level in design and production and music. The School is the only state institution, which is dedicated entirely to the professional training of students who possess exceptional talent in the performing arts. According to the Enabling Act, the mission is distinctive.

North Carolina School of the Arts' Information Technologies division is responsible for centralized IT management. The Associate Vice Chancellor/CIO is the head of the IT Division and reports directly to the Vice Chancellor for Finance and Administration. The IT division is composed of six (6) areas: Administrative Systems, Desktop Support, Instructional Technologies, Networks and Telecommunications, Video Conferencing, and Website Management.

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

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### **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. NCSA 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 NCSA 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.

We noted several weaknesses in access controls that if corrected would further enhance network security. 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 weaknesses 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 note 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 agency in significant ways. Consequently, the agency 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.

NCSA no longer performs any significant in-house systems development. New application systems are purchased from software vendors and the purchases are guided by procedures and standards for the procurement of software products. 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. NCSA'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 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 the operations procedures of the computer center.

### **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 weakness in disaster recovery planning.

## 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  
Mr. Robert L. Powell

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Director, Fiscal Research Division

May 9, 2005

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