STATE OF NORTH CAROLINA

AUDIT OF THE INFORMATION SYSTEMS

GENERAL CONTROLS

AT

NORTH CAROLINA SCHOOLS OF THE ARTS

WINSTON-SALEM, NORTH CAROLINA

SEPTEMBER 2000

OFFICE OF THE STATE AUDITOR

RALPH CAMPBELL, JR.

STATE AUDITOR

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AUDITOR'S TRANSMITTAL

The Honorable James B. Hunt, Jr., Governor
Members of the North Carolina General Assembly
Board of Trustees, North Carolina Schools of the Arts
Mr. Alex C. Ewing, Chancellor

Ladies and Gentlemen:

We have completed our information systems (IS) audit of the administrative computer operations at the North Carolina School of the Arts (NCSA). 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 the NCSA. The scope of our IS general controls audit included general security issues, access controls, program maintenance, physical security, operations procedures, system software, telecommunications, and disaster recovery. Other IS general control topics were reviewed as considered necessary. We also evaluated controls for the NCSA One Card operations.

This report contains an executive summary that highlights the areas where the North Carolina School of the Arts has performed satisfactorily and where improvements have been made.

We wish to express our appreciation to the staff at the North Carolina School of the Arts 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,

Ralph Campbell, Jr.

Ralph Campbell, Jr.
State Auditor

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EXECUTIVE SUMMARY

We conducted an information systems (IS) audit at the North Carolina School of the Arts to evaluate the IS general controls in place. Our initial review was conducted from November 29, 1999 through December 23, 1999. We conducted a follow-up review through May 17, 2000. This follow-up work was to determine the updated status of IS controls in place as of that date.

Our review focused on general security, access controls, program maintenance, physical security, operations, systems software, telecommunications and disaster recovery. We did not note any significant weaknesses in these areas as a result of our interviews, examinations and testing.

In addition to the general controls examined, we reviewed the control environment for the NCSA One Card operations. The NCSA One Card provides the School with a one-card system that allows access to campus services and facilities. Our initial field work identified several weaknesses in the NCSA One Card policies and procedures. These weaknesses were reported to the School and appropriate corrective action was taken and documented in our follow-up review.

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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 specific general controls at the North Carolina School of the Arts.

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 procedures, physical security, operations procedures, systems software, telecommunications, and disaster recovery procedures which directly affect the Information Systems Department. Other IS general control topics were reviewed as considered necessary. We also evaluated controls for the NCSA One Card operations.

METHODOLOGY

This IS audit was performed in accordance with *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. Our methodology included:

- Reviews of policies and procedures.
- Interviews with key administrators and other personnel.
- Examinations of system configurations.
- Tours of the computer facility.
- On-line testing of system controls.
- Reviews of appropriate technical literature.
- Reviews of computer generated reports.
- Use of security evaluation software.

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BACKGROUND INFORMATION

The North Carolina School of the Arts, located on fifty-seven wooded acres near downtown Winston-Salem, North Carolina, is one of the sixteen campuses of the University of North Carolina. It was established in 1965, the first state-supported school in the United States providing professional training in the performing and visual arts. About two thirds of the student body, which currently numbers around 1,000, are college students seeking degrees or diplomas in one of the five arts schools which comprises the School.

The Vice Chancellor for Finance and Administration reports directly to the Chancellor and has the responsibility for overseeing the financial and administrative operations of the School. The Information Systems Department reports to the Vice Chancellor for Finance and Administration and supervises the administrative functions of data processing and coordinates the administrative computer operations and computer training for all offices. Included in the Department's responsibilities are the operations and maintenance of the campus network which provides a connection to the mainframe and Internet for the campus faculty, students and staff. Limited computing support to the academic staff and students is also provided.

Other departments, that report to the Vice Chancellor, with responsibility for computer processing include Administrative Systems and Procedures and the One Card Office. The Administrative Systems and Procedures department analyzes business operations to recommend improvement options. This department provides system assessments and coordinates administrative policy and procedure development. The One Card Office issues the multi-purpose campus card which is used as an ID card, debit card, library card and access card to campus facilities including the computer center.

The NCSA One Card Office provides the school with a one-card system that allows access to campus services and facilities. The NCSA One Card is available to all currently registered students, and currently employed faculty and staff. The NCSA One Card debit account is an optional, no cost feature of the card and may be used for miscellaneous purchases on campus. Each time the card is used to make a purchase, the amount is electronically deducted from a pre-paid account.

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The following audit results reflect the areas where the North Carolina School of the Arts has performed satisfactorily and where improvements have been made.

GENERAL CONTROLS REVIEW

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, a security organization and resources, policies regarding access to the computer systems and a security education program.

The School 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 access control environment consists of access control software and information security policies and procedures. A security administrator should develop information security policies, perform account administration functions, and establish procedures to monitor and report any security violations.

The School uses the built-in security features of the mainframe operating system to control access. In addition, the School has installed a separate software package to monitor the system activity of selected users. Appropriate security policies were in place. Our audit did not identify any significant weaknesses in access controls.

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.

The School does not make changes or modifications to the vendor purchased application systems. Only approved application system updates and patches received from the vendors are installed. We did not note any significant weaknesses in the procedures used for program maintenance.

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 School'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 tapes, and maintaining computer equipment.

The operations procedures at the School are adequate to ensure that computer processing is orderly and well controlled. Our audit did not identify any significant weakness in the operations procedures of the computer center.

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 systems software when received.

The systems software at the School is properly approved and maintained by the Information Systems Department. Our audit did not identify any significant weaknesses in systems software.

TELECOMMUNICATIONS

Telecommunications is the electronic transmission of any kind of information by radio, wire, fiber optics, microwave, laser, or any other electromagnetic system. It can be evaluated along several lines including the type of system, the geographical organization and the service environment. The computer service center's telecommunications activities should be operated in a way that protects the security and completeness of data being transmitted.

The School has implemented controls over the physical access to telecommunications hardware and the transmission of data. We did not note any significant weaknesses over telecommunications.

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 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.

The School has developed and adopted a campus-wide disaster recovery plan and tested that plan. The plan encompasses the computer center as well as the individual departments. The Chancellor has approved the overall plan and the appropriate department head has approved the individual department plans. We did not note any significant weaknesses in disaster recovery planning.

NCSA ONE CARD

The NCSA One Card Office provides the School with a One Card system that allows access to campus services and facilities. The One Card system should be operated in a way to protect against misuse and unauthorized access. We noted several weaknesses in the NCSA One Card Operations' policies and procedures during our initial audit work, which we conveyed to the School. These conditions are described in the following paragraphs.

The School had no procedures for the independent review of the access rights granted to card users and the system configuration settings. These responsibilities were performed by the One Card administrator. The School has established policies and procedures effective May 1 and May 18, 2000 to have access rights and system configuration settings for the One Card system reviewed by someone other than the One Card administrator.

We found incidences of non-compliance with policies and procedures for the administration of the One Card system. The School has implemented procedures effective May 1, 2000 to ensure that all School employees adhere to defined policies and procedures. In addition, the Director of Administrative Systems and Procedures, in conjunction with the Vice Chancellor of Finance and Administration will review and confirm that the administration of the One Card system complies with existing policies and procedures.

We found that policies and procedures for closing student accounts and refunding balances for the One Card system were unclear. These policies and procedures were rewritten effective May 1, 2000 to more clearly reflect management's policy.

Based on observations during our follow-up audit work, we determined that these issues have been satisfactory resolved.

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In accordance with G.S. § 147-64.5 and G.S. § 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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