STATE OF NORTH CAROLINA

AUDIT OF THE INFORMATION SYSTEMS

GENERAL CONTROLS

WINSTON-SALEM STATE UNIVERSITY

OCTOBER 2008

OFFICE OF THE STATE AUDITOR

LESLIE MERRITT, JR., CPA, CFP

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Leslie Merritt, Jr.,
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State Auditor

AUDITOR'S TRANSMITTAL

The Honorable Michael F. Easley, Governor
Members of the North Carolina General Assembly
Board of Trustees, Winston-Salem State University
Dr. Donald Reaves, Chancellor

Ladies and Gentlemen:

We have completed our information systems (IS) audit of Winston-Salem State University. This audit was conducted during the period from April 22, 2008 through June 6, 2008. 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 University. The scope of our IS general controls audit included general security, access controls, program maintenance, systems software, systems development, physical security, operations procedures, help desk, 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 Winston-Salem State University 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 Winston-Salem State University 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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We conducted an Information Systems (IS) audit of Winston-Salem State University (WSSU) from April 22, 2008 through June 6, 2008. 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. Winston-Salem State University has established a reasonable security program that addresses the general security of information resources. *We did not note any significant weaknesses in general security controls of information resources.*

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).

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. *We did not identify any significant weaknesses in systems software during our audit.*

Systems Development includes the creation of new application systems or significant changes to existing systems. *We did not identify any significant weaknesses in systems development 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.*

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

The **help desk** function ensures that any problem experienced by a computer system user is appropriately resolved. *We did not identify any significant weaknesses in the help desk operations during our audit.*

A complete **disaster recovery** plan that is tested periodically is necessary to enable Winston-Salem State University to recover from an extended business interruption due to the destruction of the computer center or other University assets. *We did not identify any significant weaknesses in disaster recovery.*

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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 Winston-Salem State University.

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, help desk, and disaster recovery which directly affect Winston-Salem State University'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 application 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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Winston-Salem State University was founded as the Slater Industrial Academy on September 28, 1892. It began in a one-room frame structure with 25 pupils and one teacher. In 1895, the school was recognized by the State of North Carolina, and in 1897 it was chartered by the State as Slater Industrial Academy and State Normal School. In 1925, the N.C. General Assembly granted the school a new charter that extended its curriculum above high school, changed its name to Winston-Salem Teachers College, and empowered it under the State Board of Education to confer degrees. In 1963, its name was changed to Winston-Salem State College, and in 1969 it became Winston-Salem State University. In 1971, WSSU became one of the 16 constituent institutions of the University of North Carolina.

Winston-Salem State University is a public university whose primary mission is to offer high quality educational programs at the baccalaureate level for diverse and motivated students. Master's and intermediate level programs for professional study are also available in the Winston-Salem State University Graduate Center through inter-institutional agreements. While the primary focus is on teaching and learning, the University encourages scholarship and creative relationships with the community in ways that complement its educational mission. The academic program comprises three components – general education, specialized education and continuing education. The area of general education provides for all students the academic foundations and cultural experiences essential to a liberal arts education.

The area of specialized education provides students with the experiences necessary to master an academic discipline in preparation for graduate and professional schools and/or employment. In this regard the University has a special role to offer professional programs especially relevant to the health sciences. The area of continuing education offers individuals opportunities to enrich life or improve vocational status through constant, periodic or occasional study.

The mission of Information Resources is to support and strengthen the academic and administrative needs of faculty, staff and students at Winston-Salem State University. Information Resources serves the faculty, staff and students by facilitating the enhancement of student development and services, teaching and learning, research, outreach and administrative operations through technology.

The **purpose of Administrative Information Systems (AIS)** is to provide an automated way to collect, store and process the University's administrative data. AIS provides a range of services that include;

- Software and system installation, implementation, maintenance and support of integrated electronic systems,
- technical support, analysis and maintenance of integrated solutions; day-to-day support for applications and systems,
- oracle database administration and unix system administration services, and
- user access for applications.

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AUDIT RESULTS AND AUDITEE RESPONSES

The following audit results reflect the areas where Winston-Salem State University (WSSU) 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. Winston-Salem State University has established a reasonable security program that addresses the general security of information resources. *We did not note any significant weaknesses in general security during our audit.*

ACCESS CONTROLS

The most important information security safeguard that Winston-Salem State University 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 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).

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. *We did not note 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 identify any significant weaknesses in system software.*

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. *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. Winston-Salem State University'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.*

HELP DESK

The help desk function ensures that any problem experienced by the user is appropriately resolved. An effective help desk operation: 1) adequately registers all customer requests, 2) ensures that customer requests, which cannot be resolved immediately, are prioritized and assigned to appropriate personnel for resolution, and 3) ensures that procedures are in place for management to identify and monitor outstanding requests that have not been resolved in a timely manner. *Our audit did not identify significant weaknesses in the help desk operations.*

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. *We did not note any significant weaknesses in the operations procedures of the computer center during our audit.*

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, the University's operations would be interrupted. To reduce this risk, computer service centers develop business continuity plans. Business continuity procedures should be tested periodically to ensure the recoverability of the data center. *Our audit did not identify any significant weaknesses in disaster recovery.*

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