



STATE TEACHERS
RETIREMENT SYSTEM
OF OHIO

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March 29, 2019

Ms. Bethany Rhodes, Director
Ohio Retirement Study Council
30 E. Broad St.
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Columbus, OH 43215

RETIREMENT BOARD CHAIR
ROBERT STEIN

RETIREMENT BOARD VICE CHAIR
CAROL CORRETHEERS

EXECUTIVE DIRECTOR
MICHAEL J. NEHF

Dear Bethany:

Pursuant to Substitute Senate Bill 133 and as required by Section 3307.044 of the Ohio Revised Code, enclosed is a report of the actions of the Audit Committee of the State Teachers Retirement Board for calendar year 2018.

Please don't hesitate to contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Michael J. Nehf', written in a cursive style.

Michael J. Nehf
Executive Director

Enclosure

To: Ohio Retirement Study Council (ORSC)

Subject: STRS Ohio Audit Committee Report – 2018

Date: March 26, 2019

As required by Section 3307.044 of the Ohio Revised Code, the following report outlines the activities of the STRS Ohio Audit Committee and the STRS Ohio Internal Audit Department for the year ending Dec. 31, 2018. This report outlines the following: audit reviews completed during 2018; STRS Ohio Audit Committee meetings and actions; special reviews completed during 2018; and the 2019 Internal Audit Plan. Audit Committee members during 2018 were Robert Stein (Chair/Retired Member), David Gruber (Vice Chair/Appointee), Robert McFee (Active Member), Wade Steen (Appointee), Sarah Wickham (SPI Representative), and Carol Correthers (Active Member).

Audit Reviews Completed During 2018

The attached 2018 Internal Audit Summary lists the audits performed, the scope of each audit, the recommendations to management; management's response and expected implementation dates. The Internal Audit Summaries were provided to all STRS Ohio Board Members in March, June, September, and December of 2018.

STRS Ohio Audit Committee Meetings and Actions

A meeting of the Audit Committee was called to order by the committee chair on Dec. 13, 2018, at 8 a.m. Committee members present were Mr. Stein, Mr. Gruber, Mr. McFee, Mr. Steen and Ms. Wickham. Board members present were Ms. Correthers, Mr. Price, Mr. Rhodes and Ms. Walters. Staff present included Mr. Nehf, Mr. Snyder, Ms. Hoover, Mr. Tackett and Mr. Vance.

Mr. Tackett informed the committee that the recommendations listed on the 2018 Internal Audit Summary have been implemented by management and staff or are in the process of completion.

Mr. Tackett then reviewed the Executive Summary of the 2019 Internal Audit Plan, schedule risk factors and risk assessment scale.

Mr. Snyder introduced Kevin Rohrs from CliftonLarsonAllen.

Mr. Stein moved, seconded by Mr. Gruber to enter executive session under authority of Division (G)(5) of Section 121.22 of the Ohio Revised Code for the purpose of discussing matters required to be kept confidential by federal law or state statute.

Upon roll call the vote was as follows: Mr. Stein, yes; Mr. Gruber, yes; Mr. McFee, yes; Mr. Steen, yes; Ms. Wickham, yes. Motion carried.

Public session resumed and the meeting adjourned at 8:55 a.m.

Upon roll call the vote was as follows: Ms. Hayden, yes; Mr. Rhodes, yes; Ms. Correthers, yes; Mr. McFee, yes; Mr. Price, yes; Ms. Walters, yes; Ms. Wickham, yes; Mr. Stein, yes. Motion carried.

A meeting of the Audit Committee was called to order by the committee chair on Aug. 16, 2018, at 8:30 a.m. Committee members present were Mr. Hill and Mr. Gruber. Board members Mr. Price, Mr. Stein, Ms.

Walters and Ms. Wickham were also in attendance. Staff present included Mr. Nehf, Mr. Snyder, Ms. Hoover, Mr. Tackett, Mr. Vance and Mr. Licata.

Mr. Snyder introduced Kevin Rohrs of CliftonLarsonAllen to present a summary of their plan for the 2017-2018 financial statement audit and tentative schedule for issuing an audit report. The overall risk assessment on this engagement is moderate and CliftonLarsonAllen has identified investments, contributions, benefit payments and actuarial assumptions as critical audit areas. The final audit report will be presented to the Audit Committee in December.

Mr. Tackett then provided a review of the Quarterly Internal Audit Summary and informed the committee that there were no material findings and that there was full cooperation from management. Management accepted all internal audit recommendations and is in various stages of action planning or implementation. The next update will be presented to the Audit Committee at the December meeting. All audit activity for 2018 will be summarized and the 2019 Internal Audit Plan will be presented at that time for approval.

Mr. Tackett informed the Audit Committee that his review of the FY2018 PBIs was complete and he found the PBIs to be in compliance with the STRS Ohio Board Policy.

Mr. Tackett introduced Mr. Licata for a report on the Saperstein audit. Mr. Licata provided a summary of the audit review which included six (6) recommendations. Three of the recommendations have been implemented and/or resolved. The remaining recommendations are under review by management.

The meeting adjourned at approximately 9:20 a.m.

Upon roll call, the vote was as follows: Mr. Stein, yes; Mr. Gruber, yes; Ms. Correthers, yes; Ms. Hayden, yes; Mr. McFee, yes; Mr. Price, yes; Mr. Rhodes, yes; Mr. Steen, yes; Ms. Walters, yes; Ms. Wickham, yes. Motion carried.

Special Reviews/Projects

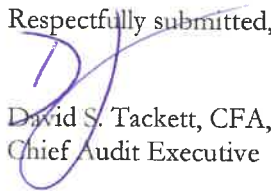
See 2018 Internal Audit Summary: "I.T. Security: Vendor Review Saperstein (SAI)"

2019 Internal Audit Plan

The 2019 Internal Audit Plan was approved by the STRS Ohio Board on December 13, 2018. A copy of the 2019 Internal Audit Plan is enclosed.

If you have any questions, or need further information, please feel free to call me at (614) 227-2821.

Respectfully submitted,


David S. Tackett, CFA, CPA, CIA
Chief Audit Executive

2018 Internal Audit Summary

Closed Audits: Recommendations

Audit Area	Risk Rating	Scope	Recommendations	Management's Response	Implemented	Implementation or Target Implementation
Alternative Investments - Private Equity	Medium	Due Diligence	Provide documentation of adherence to due diligence steps.	Agree	Yes	September 2018
		Monitoring	Research best practices related to private equity management fees.	Agree*	No	July 2019
		General Partner Fees				
		Valuations				
<i>Comment: Agree*</i> - Management responses included additional, detailed information of previously established, multi-departmental efforts to insure an appropriate structure for monitoring. Management response accepted by Internal Audit.						
I.T. PeopleSoft Security	Medium	Password/Access Controls	Passwords to privileged accounts should be monitored/not shared.	Agree ^v	No	June 2018
		Configuration Controls	Change passwords every 90 to 180 days for key systems and applications	Agree*	No	February 2019
		<i>Comment: Agree*</i> - Due to complexity and business impact, an agreement was reached to update VP1 passwords each time a PeopleSoft Update Manager (PUM) is applied (12 to 18 months). Compensating, interim controls accepted by Internal Audit. ITS will begin an annual process of reviewing all other PeopleSoft user accounts. <i>Agree^v</i> - Feasibility study will be conducted for removal of STRSDEV and creation of read-only PeopleSoft accounts for necessary positions.				
IT Security: Vendor Review Saperstein (SAI)	Medium	Compliance with Vendor Risk Assessment Process	Set email configuration to require Transport Layer Security (TLS) to protect confidential data.	Agree	Yes	August 2018
			Substitute date of birth data element with another age indicator when transmitting confidential data.	Agree	Yes	August 2018
			Delete unencrypted STRS Ohio data from SAI servers and remove date of birth data element from stored data.	Agree ¹	Yes	August 2018
			Update SAI's software to meet current industry security standards that reduce the risk of untended access to STRS Ohio member data.	Agree ²	Yes	August 2018
			Align SAI's Windows group policy settings to limit number of erroneous log-on attempts and set password complexity to match industry security standards.	Agree	Yes	August 2018
			Review SAI contract to resolve compliance issues related to subcontracting.	Agree	Yes	November 2018
			<i>Comment: Agree¹</i> - Changes will be in effect at the time of the next data transmission. <i>Agree²</i> - Management procedures confirmed: No STRS Ohio data stored on older machines that have not/will not be updated to current software and protection standards.			
Securities Lending	Low	Policies and Procedures	Automate the monitoring process to increase efficiency and to minimize the potential for errors.	Agree	No	January-19
		Compliance				
		Reinvestment of Cash Collateral				
		Accuracy of Income				
		Approved Borrowers				
		Reconciliations of Monthly Earnings Report				

Closed Audits: No Recommendations

Audit Area	Risk Rating	Scope	Management's Response
Annual Statements	N/A	Accuracy of Member Information Accuracy and Security of Statements External Contracts Segregation of Duties	N/A
Accounts Payable	N/A	Vendor Approval Process Vendor Payment History Segregation of Duties/Access Controls	N/A
Attendance Reporting	N/A	Accuracy of Attendance Reporting Data Compliance with Policies Absence Reporting Off-Payroll Monitoring	N/A
Building Maintenance	N/A	Preventative Maintenance Associate Training Quality Assurance Purchases of Goods and Services	N/A
Disability Benefits	N/A	Reexamination Schedules Statement of Employment/Earnings Terminated Benefits - Notification Benefit Calculations Medical Invoice Payments	N/A
Fixed Asset - Computers	N/A	Purchasing Accuracy of Inventory Records Disposition	N/A
Insurance/Risk Management	N/A	Compliance with the STRS Ohio Insurance and Risk Mgmt. Manual Adequacy of Existing Insurance Policies Adequacy of Carrier's Ratings Accuracy of Premium Payments Segregation of Duties	N/A
Liquidity Reserves	N/A	Compliance with Policies Income Purchases/Sales	N/A

Member Services Center	N/A	Associate Training Scheduling Performance Monitoring Key Performance Indicators	N/A
Performance/PBI Review	N/A	Associate Eligibility Compliance with PBI Policy	N/A
Personal Investment Disclosure*	N/A	Compliance with Policies Accuracy/Completeness	N/A
Petty Cash*	N/A	Compliance with Policies/Procedures Segregation of Duties Proper Cash Handling Physical Security Sufficiency of Audit Trail	N/A
Real Estate	N/A	Property Manager Fees Property-Level Expenses External Compliance Reviews Site Inspections Tenant Surveys Valuations Due Diligence Compliance with Policies and Procedures	N/A
Service Retirement Benefits*	N/A	Department Process Documentation Benefit Calculations Management of Overpayments Segregation of Duties	N/A
Survivor Benefits	N/A	Benefits Calculations Segregation of Duties	N/A

Active Audits

Audit Area	Risk Rating	Scope	Target Completion
Annual Reporting	N/A		December-18
Benefit Services	N/A	Annuity Certain Expiration Overpayments/Collections Disbursement Compliance-Death Benefit	March-19

Business Continuity Plan	N/A	General Compliance with Policies and Procedures Departmental Plan Compliance Documentation of Changes and Approvals	
Building Maintenance	N/A	Preventative Maintenance Associate Training Quality Assurance Purchases of Goods and Services	December-18
Derivatives	N/A	Derivative Exposure Report Currency Forward Settlements Equity SWAP Settlements Counterparty Risk Equity SWAP Collateral Liquid Theme/Hedge Segregation of Duties	February-19
Financial Reporting	N/A	Security/Segregation of Duties Journal Entries Disaster Recovery Protection Audit Trail Integrity	December-18
Fixed Assets	N/A	Tracking, Reporting, and Monitoring Depreciation Disposition	December-18
Fixed Income Investments	N/A	Compliance with Investment Policies Approved Brokers/Commissions Due Diligence Monitoring of External Managers Interest Income	December-18
Health Care	N/A	Records Retention/Management-Member Application Issues Monitoring and Resolution Segregation of Duties Vendor Payments & Reconciliation	February-19

Rescheduled Audits

Audit Area	Scope	Explanation
Domestic Equities	Compliance with the Investments Objectives and Policy Research Costs Monitoring of External Portfolio Managers Reporting/Accounting External Management Fees Approved Brokers	Change in Internal Audit personnel
International Investing	External Management Fees Monitoring of External Managers Foreign Tax Reclamations Sub-Custodian Controls	Change in Internal Audit personnel

Other Audit Related Activity

Area	Risk Rating	Subject/Project	Description
I.T.S.	N/A	STaRS Upgrade	Consult with ITS and the user community on the security functionality and needs of the system.
Multi-departmental	N/A	DLP (Data Loss Prevention)	Participate on the DLP Committee to implement, monitor and evaluate the data loss prevention as it should function at STRS Ohio.
Multi-departmental	N/A	STRS Ohio Disaster Recovery	Participate in disaster recovery testing review. Strategize on business and human resource needs.

* Audits were listed as "Under Mgmt. Review", "In Progress", "Audit Initiated", or had not implemented recommendation(s) at the time of the last Annual Audit Summary presentation.

Risk Rating Level: (Refers to rating assigned to findings/recommendations)

High: Requires Immediate attention and remediation.

Medium (Med): Requires near-term attention.

Low: Improvements possible but does not require attention in immediate or near-term.

Composition of Current Audit Committee:

Robert Stein, Chair/Retired Member

David Gruber, Vice Chair/Appointee

Robert McFee, Active Member

Wade Steen, Appointee

Sarah Wickham, Representing the Superintendent of Public Instruction

Carol Correthers, Active Member/Non-Voting Observer



2019 Internal Audit Plan

INTERNAL AUDIT DEPARTMENT

Mission Statement

To work in partnership with associates to conduct value-added independent appraisals of policies and procedures to contribute to the continuous improvement of STRS Ohio.

Vision Statement

To be recognized as an innovative department that, through independent appraisals and partnered solutions, strives for quality enhancements and the elimination of non-value-added processes.

To create an environment that encourages teamwork, innovation, open communication, empowerment and personal and professional growth.

Guiding Principles

To achieve our mission and vision, we will:

- Prepare a comprehensive, practical, planned program of audit coverage consistent with STRS Ohio's mission, vision and guiding principles.
- Perform audits in compliance with the International Standards for the Professional Practice of Internal Auditing.
- Verify the adequacy and effectiveness of STRS Ohio's systems of administrative, operating and financial controls.
- Understand the associates' business from their perspective.
- Produce objective, clear, concise, constructive and timely reports.
- Maintain contemporary professional proficiency through continuing education and training.
- Seek to continuously improve our team, tools and processes.
- Develop professional expertise for potential career opportunities within STRS Ohio.

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2019 INTERNAL AUDIT SCHEDULE

Audit Area	Description of Audit Area	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Proxy Voting	Proxy Voting for Active Investments Compliance with Proxy Voting Policy												
Benefit Payment Process	Investment Operations Department Review and Verification ITS Department Review and Verification Finance Department Review and Verification Segregation of Duties												
Alternative Investments	Proper Notification and Approval Due Diligence Valuations Monitoring of Opportunistic Diversified Funds Segregation of Duties												
Contribution Reporting	Foundation Management Employee Contribution Management G/L Posting Segregation of Duties Annual Report Management												
Purchasing Service Credit	STaRS Access Certifications and Cost Calculations Member Applications Posting of Purchased Service Credit Payments Compliance with the Ohio Revised Code												
Flexible Spending Program	Withholdings Disbursements												
Child Care Center	Compliance with State Licensing Rules Compliance with State Inspections Enrollment Tuition Payments Review of Cost Neutrality Segregation of Duties												
Defined Contribution Plan	Processing of Retirement Plan Selection Forms NRS Contract Compliance Accuracy of Member Statements Segregation of Duties												
Educational Assistance Program	Educational Assistance Application Tuition Repayments Spending Limitations												

2019 INTERNAL AUDIT SCHEDULE

Audit Area	Description of Audit Area	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Domestic Equities	Compliance with the Investment Objectives and Policy					■	■						
	Reconciliation of External Manager Positions					■	■						
	Monitoring of External Portfolio Managers					■	■						
	External Management Fees					■	■						
	Approved Brokers					■	■						
Purchase Service Credit by Payroll Deduction	Member Application						■						
	Processing of Payroll Deduction Receipts						■						
	Segregation of Duties						■						
	Payroll Deduction Refunds						■						
I.T. Security: Database	Access to Database Listener						■	■					
	Default Accounts and Passwords						■	■					
	Access to Public Role						■	■					
	Password Settings						■	■					
	Host-Based Authentication						■	■					
Investment Performance/PBI Review	Associate Eligibility								■				
	Compliance with PBI Policy								■				
Purchasing Practices	Compliance with Policies									■			
	Receipt of Goods and Services									■			
Board Expenses	Preapproval of Travel										■		
	Accuracy of Reimbursement										■		
	Compliance with Rules/Policies										■		
Unused Sick and Vacation	Compliance											■	
	Accuracy of Payments											■	
I.T. Security: Cyber Vulnerabilities	Accuracy of Attendance Reporting Data											■	■

RISK FACTORS

RISK FACTOR	RISK FACTOR DESCRIPTION	WEIGHTING
A	Adequacy and Effectiveness of the System of Internal Controls	9
B	Major Changes in Technology, Operations, the Organization or the Economy	8
C	Dates and Results of Previous Audits	7
D	Recent or Relevant Changes in Key Personnel	6
E	Complexity or Volatility of Activities	5
F	Asset Size or Transaction Volume	4

RISK ASSESSMENT SCALE

The risk assessment scale is a 9-point system with graduations of risk as follows:

RISK FACTOR DESCRIPTION	SCORE
Extremely Risky	9
Very Risky	7
Risky	5*
Slightly Risky	3
Not Risky	1

* If no previous audit was performed, the auditable area was assessed a 5 — Risky.

ASSIGNMENT OF RISK RATING

Audit Area	Risk Factors*						Total
	A	B	C	D	E	F	
ADMINISTRATION							
Associate Payroll	2	2	2	2	2	2	12
Associate Travel Expenses	2	1	1	1	1	2	8
Attendance Reporting	4	2	2	2	2	2	14
Benefit Payment Process	3	4	3	3	3	3	19
Board Expenses	1	1	1	1	1	1	6
Building Maintenance	2	2	2	2	2	4	14
Business Continuity Plan	3	3	3	3	4	3	19
Child Care Center	2	2	2	2	2	1	11
Educational Assistance Program	2	2	2	2	2	2	12
Fixed Assets — Computer Equip.	3	4	2	3	3	4	19
Flexible Spending Plans	2	2	2	2	3	2	13
Insurance/Risk Management	2	2	1	1	2	2	10
OEC Reporting	1	2	1	2	2	1	9
Other Staff Expenses	2	2	1	1	1	1	8
Personal Investment Disclosure	1	1	3	3	5	3	16
Postage	2	2	2	1	2	3	12
Purchasing Practices	3	2	3	2	2	3	15
STRS Ohio Self Insurance Plan	3	2	3	2	3	3	16
Unused Sick and Vacation Leave	2	1	2	2	2	1	10

* See Page 3 for description of risk factors.

ASSIGNMENT OF RISK RATING

Audit Area	Risk Factors*						Total
	A	B	C	D	E	F	
FINANCE							
Accounts Payable	2	1	2	1	2	2	10
Annual Reporting	2	3	2	2	2	2	13
Contribution Reporting	1	3	1	1	3	5	14
Financial Reporting (STRS Ohio)	3	3	2	2	4	4	18
Fixed Assets	3	2	3	4	2	2	16
Member Income Taxes	1	1	2	2	4	5	15
Member Withdrawals	2	1	2	2	2	2	11
Petty Cash/Café Operations	2	2	2	3	1	1	11
Purchasing Service Credit by Payroll Deduction	2	3	2	2	3	3	15

Audit Area	Risk Factors*						Total
	A	B	C	D	E	F	
INFORMATION TECHNOLOGY SERVICES							
AIX/ Windows Security	5	3	5	1	5	5	24
Compliance: B.Y.O.D.	5	3	5	1	5	5	24
Database Security	5	3	5	1	5	5	24
I.T. Operations	3	3	3	1	3	3	16
I.T. Security: Change Control	3	3	3	3	3	3	18
I.T. Security: Logical/Physical Access	3	3	3	1	5	5	20
I.T. Security: HIPAA	5	3	5	1	5	5	24
I.T. Security: PeopleSoft Security	3	3	3	3	5	5	22
I.T. Security: Cyber Vulnerabilities	5	5	5	5	5	5	30

* See Page 3 for description of risk factors.

ASSIGNMENT OF RISK RATING

Audit Area	Risk Factors*						Total
	A	B	C	D	E	F	
INVESTMENTS							
Alternative Investments	3	3	2	2	4	4	18
Derivatives	3	4	2	3	4	3	19
Domestic Equities	3	4	2	2	4	5	20
Fixed Income	2	5	2	3	3	5	20
International Investing	5	5	2	1	4	4	21
Investment Performance	2	2	2	2	2	2	12
Liquidity Reserves	1	2	1	1	2	3	10
Proxy Voting	2	1	1	1	2	2	9
Real Estate	3	4	3	3	3	3	19
Securities Lending	2	3	2	2	4	4	17

Audit Area	Risk Factors*						Total
	A	B	C	D	E	F	
MEMBER BENEFITS							
Annual Statements	2	2	2	2	2	2	12
Benefit Services	3	4	2	2	2	2	15
Defined Contribution Plan	2	2	2	2	2	3	13
Disability Benefits	3	2	2	4	2	3	16
Health Care	3	2	2	2	3	4	16
Member Data Management	3	4	4	2	2	2	17
Member Records Management	2	2	2	2	2	2	12
Member Services Center	2	2	2	1	2	2	11
Purchasing Service Credit	2	3	2	2	2	2	13
Reemployed Retirees	2	3	2	2	2	2	13
Service Retirement Benefits	2	3	2	3	3	3	16
Survivor Benefits	3	2	2	3	2	3	15

* See Page 3 for description of risk factors.

RISK FACTORS WEIGHTED

Audit Area	Risk Factors*						Total
	A	B	C	D	E	F	
ADMINISTRATION							
Associate Payroll	18	16	14	12	10	8	78
Associate Travel Expenses	18	8	7	6	5	8	52
Attendance Reporting	36	16	14	12	10	8	96
Benefit Payment Process	27	32	21	18	15	12	125
Board Expenses	9	8	7	6	5	4	39
Building Maintenance	18	16	14	12	10	16	86
Business Continuity Plan	27	24	21	18	20	12	122
Child Care Center	18	16	14	12	10	4	74
Educational Assistance Program	18	16	14	12	10	8	78
Fixed Assets — Computer Equip.	27	32	14	18	15	16	122
Flexible Spending Plans	18	16	14	12	15	8	83
Insurance/Risk Management	18	16	7	6	10	8	65
OEC Reporting	9	16	7	12	10	4	58
Other Staff Expenses	18	16	7	6	5	4	56
Personal Investment Disclosure	9	8	21	18	25	12	93
Postage	18	16	14	6	10	12	76
Purchasing Practices	27	16	21	12	10	12	98
STRS Ohio Self Insurance Plan	27	16	21	12	15	12	103
Unused Sick and Vacation Leave	18	8	14	12	10	4	66

* See Page 4 for description of risk factors.

RISK FACTORS WEIGHTED

Audit Area	Risk Factors*						Total
	A	B	C	D	E	F	
FINANCE							
Accounts Payable	18	8	14	6	10	8	64
Annual Reporting	18	24	14	12	10	8	86
Contribution Reporting	9	24	7	6	15	20	81
Financial Reporting (STRS Ohio)	27	24	14	12	20	16	113
Fixed Assets	27	16	21	24	10	8	106
Member Income Taxes	9	8	14	12	20	20	83
Member Withdrawals	18	8	14	12	10	8	70
Petty Cash/Café Operations	18	16	14	18	5	4	75
Purchasing Service Credit by Payroll Deduction	18	24	14	12	15	12	95

Audit Area	Risk Factors*						Total
	A	B	C	D	E	F	
INFORMATION TECHNOLOGY SERVICES							
AIX/ Windows Security	45	24	35	6	25	20	155
Compliance: B.Y.O.D.	45	24	35	6	25	20	155
Database Security	45	24	35	6	25	20	155
I.T. Operations	27	24	21	6	15	12	105
I.T. Security: Change Control	27	24	21	18	15	12	117
I.T. Security: Logical/Physical Access	27	24	21	6	25	20	123
I.T. Security: HIPAA	45	24	35	6	25	20	155
I.T. Security: PeopleSoft Security	27	24	21	18	25	20	135
I.T. Security: Cyber Vulnerabilities	45	40	35	30	25	20	195

* See Page 4 for description of risk factors.

RISK FACTORS WEIGHTED

Audit Area	Risk Factors*						Total
	A	B	C	D	E	F	
INVESTMENTS							
Alternative Investments	27	24	14	12	20	16	113
Derivatives	27	32	14	18	20	12	123
Domestic Equities	27	32	14	12	20	20	125
Fixed Income	18	40	14	18	15	20	125
International Investing	45	40	14	6	20	16	141
Investment Performance	18	16	14	12	10	8	78
Liquidity Reserves	9	16	7	6	10	12	60
Proxy Voting	18	8	7	6	10	8	57
Real Estate	27	32	21	18	15	12	125
Securities Lending	18	24	14	12	20	16	104

Audit Area	Risk Factors*						Total
	A	B	C	D	E	F	
MEMBER BENEFITS							
Annual Statements	18	16	14	12	10	8	78
Benefit Services	27	32	14	12	10	8	103
Defined Contribution Plan	18	16	14	12	10	12	82
Disability Benefits	27	16	14	24	10	12	103
Health Care	27	16	14	12	15	16	100
Member Data Management	27	32	28	12	10	8	117
Member Records Management	18	16	14	12	10	8	78
Member Services Center	18	16	14	6	10	8	72
Purchasing Service Credit	18	24	14	12	10	8	86
Reemployed Retirees	18	24	14	12	10	8	86
Service Retirement Benefits	18	24	14	18	15	12	101
Survivor Benefits	27	16	14	18	10	12	97

* See Page 4 for description of risk factors.

2019 INTERNAL AUDIT WORK PLAN

Audit Area	Priority	Dept.	Risk Score	Last Audit	Estimated Audit Date	Risk Codes
I.T. Security: Cyber Vulnerabilities	HIGH	ITS	195	N/A	2019	F, I, C, O, PS
I.T. Security: PeopleSoft Security	HIGH	ITS	135	2017		F, I, C, O, PS
International Investing	HIGH	I	141	2016	2019	F, I, C, O
Alternative Investments	HIGH	I	113	2017	2019	F, I, C, O
Domestic Equities	HIGH	I	125	2017	2019	F, I, C, O
Real Estate	HIGH	I	125	2017		F, I, C, O
Derivatives	HIGH	I	123	2018		F, I, C, O
Fixed Income	HIGH	I	125	2018		F, I, C, O
Liquidity Reserves	HIGH	I	60	2017		F, I, C, O
Board Expenses	HIGH	A	39	2018	2019	I, C, O, PS
AIX/ Windows Security	MED.	ITS	155	2017		F, I, C, O, PS
Compliance: B.Y.O.D.	MED.	ITS	155	2017		F, I, C, O, PS
Database Security	MED.	ITS	155	2014	2019	F, I, C, O, PS
I.T. Security: HIPAA	MED.	ITS	155	2015		F, I, C, O, PS
I.T. Operations	MED.	ITS	105	2017		F, I, C, O, PS
I.T. Security: Change Control	MED.	ITS	117	2016		F, I, C, O, PS
I.T. Security: Logical/ Physical Access	MED.	ITS	123	2016		F, I, C, O, PS
Business Continuity Plan	MED.	A	122	2018		F, I, C, O
Member Data Management	MED.	MB	117	2017		C, PS
Financial Reporting (STRS Ohio)	MED.	F	113	2018		I, C, O
Service Retirement Benefits	MED.	MB	101	2017		I, C, O
Annual Statements	MED.	MB	78	2017		I, C, O
Health Care	MED.	MB	100	2018		I, C, O
Contribution Reporting	MED.	F	81	2016	2019	I, C, O

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- PS: Public Sensitivity = No material financial impact but high public sensitivity

2019 INTERNAL AUDIT WORK PLAN

Audit Area	Priority	Dept.	Risk Score	Last Audit	Estimated Audit Date	Risk Codes
Annual Reporting	MED.	F	86	2015		I, C, O
Defined Contribution Plan	MED.	MB	82	2016	2019	I, C, O
Risk Management/ Insurance	MED.	A	65	2017		F, I, C, O
Accounts Payable	MED.	F	64	2018		I, C, O
Benefit Payment Process	LOW	A	125	2015	2019	I, C, O
Member Income Taxes	LOW	F	83	2017		I, C, O
Fixed Assets — Computer Equip.	LOW	A	122	2018		I, C, O
Reemployed Retirees	LOW	MB	86	2016		I, C, O
STRS Ohio Self Insurance Plan	LOW	A	103	2016		I, C, O
Securities Lending	LOW	I	104	2017		I, C, O
Fixed Assets	LOW	F	106	2018		I, C, O
Personal Investment Disclosure	LOW	A	93	2017		I, C
Disability Benefits	LOW	MB	103	2018		I, C, O
Member Services Center	LOW	MB	72	2017		C, O
Purchasing Service Credit by Payroll Deduction	LOW	F	95	2016	2019	I, C, O
Purchasing Practices	LOW	A	98	2016	2019	I, C, O, PS
Survivor Benefits	LOW	MB	97	2017		I, C, O
Member Records Management	LOW	MB	78	2016		C, O
Building Maintenance	LOW	A	86	2018		I, C, O
Postage	LOW	A	76	2018		I, C, O
Flexible Spending Plans	LOW	A	83	2016	2019	I, C, O
Investment Performance	LOW	I	78	2018	2019	I, C, O

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2019 INTERNAL AUDIT WORK PLAN

Audit Area	Priority	Dept.	Risk Score	Last Audit	Estimated Audit Date	Risk Codes
Attendance Reporting	LOW	A	96	2018		I, C, O
Associate Payroll	LOW	A	78	2016		I, C, O
Benefit Services (Post Retirement)	LOW	MB	103	2018		I, C, O
Member Withdrawals	LOW	F	70	2017		I, C, O
Educational Assistance Program	LOW	A	78	2016	2019	I, C, O
Petty Cash/Café Operations	LOW	F	75	2017		I, C, O, PS
Child Care Center	LOW	A	74	2015	2019	I, C, O
Purchasing Service Credit	LOW	MB	86	2016	2019	I, C, O
Unused Sick and Vacation Leave	LOW	A	66	2016	2019	I, C, O
Associate Travel Expenses	LOW	A	52	2017		I, C, O, PS
Other Staff Expenses	LOW	A	56	2017		I, C, O, PS
OEC Reporting	LOW	A	58	2015		I, C, O, PS
Proxy Voting	LOW	I	57	2015	2019	I, C, PS

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