

OFFICE OF THE STATE INSPECTOR GENERAL
Report to President Sands

*Virginia Polytechnic Institute
and State University Performance Review*

October 2016



June W. Jennings, CPA
State Inspector General
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COMMONWEALTH OF VIRGINIA
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October 25, 2016

Timothy D. Sands, President
Virginia Polytechnic Institute and State University
Burruss Hall, Suite 210
800 Drillfield Drive
Blacksburg, VA 24061

Dear President Sands:

Under § [2.2-309](#) [A](10) of the *Code of Virginia (Code)*, the Office of the State Inspector General (OSIG) is empowered to conduct performance reviews of state agencies to ensure that state funds are spent as intended and to evaluate the efficiency and effectiveness of programs in accomplishing their purposes. The Virginia Polytechnic Institute and State University (Virginia Tech) review was completed during the period of September 1, 2015, through August 5, 2016.

Virginia Tech was selected for review based on a 2013 statewide risk assessment completed by Deloitte, LLP. The University was ranked as the 7th highest risk agency of all executive branch agencies. Areas covered in this review were:

- Science, Technology, Engineering, Mathematics and Health (STEM-H) Program
- Faculty Start-up Packages
- Transfer and Return of Collected Revenues
- Electronic Procurement

The planning phase of the review consisted of conducting interviews with selected members of executive and divisional management. Based on these interviews, the scope was set to cover STEM-H, faculty start-up packages, transfer and return of collected revenues, and electronic procurement. Audit objectives for these areas were set and associated risks were identified. A detailed review plan was then created to accomplish the review objectives. The procedures in the review plan were then executed, and the results were provided in draft form to Virginia Tech management for review.

Overall, OSIG found that Virginia Tech's investment in STEM-H programs, faculty start-up packages, and transfer and return of collected revenue functions were operating efficiently and effectively. The required use of eVA by Virginia Tech for procurement appeared to not benefit the University, however, the required use of eVA at all state agencies and institutions needs additional evaluation beyond that conducted at Virginia Tech. Therefore, OSIG has included a separate broader review of the eVA system statewide in the FY17 audit plan.

OSIG appreciates the assistance provided by your staff during this review.

Sincerely,

June W. Jennings, CPA
State Inspector General

CC: Paul J. Reagan, Chief of Staff to Governor McAuliffe
Suzette P. Denslow, Deputy Chief of Staff to Governor McAuliffe
Dietra Trent, Secretary of Education
Senator Stephen D. Newman, Chairman of the Education and Health Committee
Delegate R. Steven Landes, Chairman of the Education Committee
James Chapman, Virginia Polytechnic Institute and State University Rector

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Executive Summary

Overall, the Office of the State Inspector General (OSIG) found that Virginia Polytechnic Institute and State University's (Virginia Tech) processes for managing the investment in STEM-H program, administering faculty start-up packages and transferring collected state revenue were operating efficiently and effectively.

OSIG reached this conclusion after:

- Conducting interviews with Virginia Tech's Executive and Senior Management as well as the staff from the Auditor of Public Accounts.
- Reviewing the University's:
 - Enrollment growth projections and resource planning for new and existing facilities.
 - Faculty staffing plans to handle projected enrollment growth.
 - Faculty turnover trends and strategies to improve faculty retention.
 - Processes for monitoring the performance of individual start-up packages and expenditures.
 - Process for the transfer and return of state revenues with the Department of the Treasury.
- Evaluating the University's faculty start-up packages and the process for monitoring the performance or return on investment of the packages.

OSIG commends Virginia Tech's Provost Office on their effective quantitative methods for monitoring start-up package outcomes.

Purpose and Scope of the Review

The Office of the State Inspector General conducted a performance review of Virginia Polytechnic Institute and State University (Virginia Tech) pursuant to *Code of Virginia* § [2.2-309](#) whereby the State Inspector General shall have power and duty to:

“Conduct performance reviews of state agencies to assess the efficiency, effectiveness, or economy of programs and to ascertain, among other things, that sums appropriated have been or are being expended for the purposes for which the appropriation was made and prepare a report for each performance review detailing any findings or recommendations for improving the efficiency, effectiveness, or economy of state agencies, including recommending changes in the law to the Governor and the General Assembly that are necessary to address such findings.”

This review was not designed to be a comprehensive review of Virginia Tech. Instead, the focus was on certain risk areas identified through a statewide risk assessment of state agencies completed by Deloitte, LLP. The scope and objectives of the review were established through interviews with management. These areas were selected for inclusion based on those interviews:

- STEM-H Program
- Faculty Start-up Packages
- Transfer and Return of Collected Revenues
- Electronic Procurement

The review objectives were to:

1. Determine whether resource planning is comprehensive enough to ensure new and existing facilities will be available to meet future needs of students in STEM-H degree programs.
2. Determine whether faculty succession planning is sufficient to ensure that Virginia Tech will be able to provide the number of instructors necessary to meet the future needs of students in STEM-H programs.
3. Determine whether faculty start-up packages contain language and provisions to protect the University in the event a faculty member leaves.
4. Determine whether a quantitative or qualitative process is in place to monitor the performance or return on investment of individual faculty start-up packages.
5. Determine whether inefficiencies exist in the transfer of state revenues from Virginia Tech to the Department of the Treasury and the return of such funds back to the University.
6. Determine whether the practice of paying eVA fees is effective in retaining vendors who would otherwise not do business with Virginia Tech and determine if continuing this practice makes good business sense for the University.
7. Be alert to any symptoms of fraud, waste, and abuse that may appear during the review and follow-up for resolution if necessary.

Background

Virginia Polytechnic Institute and State University (Virginia Tech) is a public land-grant university founded in 1872, located in Blacksburg, Virginia. Virginia Tech is an agency of the Commonwealth of Virginia (the Commonwealth) and is governed by the University's Board of Visitors, consisting of 14 members appointed by the Governor of Virginia.

The University offers 240 graduate, undergraduate, and professional degree programs to more than 32,000 students through its eight academic colleges (Agriculture and Life Sciences, Architecture and Urban Studies, Engineering, Liberal Arts and Human Sciences, Natural Resources and Environment, Pamplin College of Business, Science, and the Virginia-Maryland College of Veterinary Medicine).¹ In addition, the Virginia Tech Carilion School of Medicine, a public-private partnership between Virginia Tech and Carilion Clinic, offers a postgraduate medical degree. Virginia Tech consistently ranks among the nation's top universities for undergraduate and graduate programs and features a strong core of science, engineering, agriculture and technology disciplines.

Virginia Tech remains the leading academic research institution in the Commonwealth. According to the National Science Foundation, the University generated \$513 million in research expenditures in fiscal year 2014, ranking 39th in the nation.² In addition, Virginia Tech ranks 26th among the best national public universities and the engineering graduate school is ranked 21st, according to the 2016 U.S. News & World Report.³

Investment in STEM-H Program

The U.S. Bureau of Labor Statistics (BLS) has projected employment in the Science, Technology, Engineering, Math and Health (STEM-H) fields to grow from 2012 to 2022 by varying percentages including 7.3 percent for Architecture and Engineering Occupations, 18 percent for Computer and Mathematics Occupations, 10.1 percent for Life, Physical, and Social Science Occupations.⁴ In these three occupational areas alone, that equates to approximately one million more jobs nationwide in 2022 than in 2012.

The Virginia Higher Education Opportunity Act of 2011, also known as the Top Jobs Act or "TJ21" (§ [23-38.87:10](#)⁵ of the *Code of Virginia*), was enacted to help address the employment needs noted by BLS. As directed by § [23-38.87:17](#)⁶, the governing board of each Virginia public

¹ Virginia Tech website 'About Virginia Tech': <http://www.vt.edu/about.html>

² National Research Foundation website: <https://ncesdata.nsf.gov/profiles/site?method=view&fice=3754>

³ U.S. News & World Report "America's Best Graduate Schools 2017" (spring 2016) rankings, website: <http://colleges.usnews.rankingsandreviews.com/best-colleges/virginia-polytechnic-institute-and-state-university-233921/overall-rankings>

⁴ <http://www.bls.gov/opub/mlr/2013/article/pdf/occupational-employment-projections-to-2022.pdf>, pg. 7.

⁵ Effective October 1, 2016, this Code section changes to § [23.1-301](#)

⁶ Effective October 1, 2016, this Code section changes to § [23.1-306](#)

institution of higher education is required to adopt biennially and amend and affirm annually a six-year plan for the institution. Incentives for certain areas, including degree production in STEM-H fields, are identified within § [23-38.87:16](#)⁷. As the Commonwealth's largest producer of STEM-H graduates, Virginia Tech is well positioned to support the state's goals and higher education priorities.⁸

According to the State Council of Higher Education for Virginia (SCHEV), the University produces nearly 25 percent of the Commonwealth's four-year public-institution STEM-H degrees; more than any other institution in Virginia. In 2015, 52.8 percent of Virginia Tech's graduates earned a STEM-H degree.⁹ The University's management explained STEM-H disciplines and technology are pervasive at Virginia Tech and there is an emphasis on integrating technology into non-STEM-H programs. The University's Six-Year Plan strategies, most recently updated November 9, 2015, include expanding and enhancing STEM-H degree production in health sciences, neuroscience, creative technologies and computational thinking.¹⁰

Faculty Start-up Packages

The University is a proponent of offering start-up packages in the recruitment process to attract and retain highly sought-after faculty. The packages may include funds to support the renovation of laboratories, purchase of equipment, hiring of research staff, and training of graduate students, while the research program is being established. In fiscal year 2014/2015, Virginia Tech start-up packages totaled \$28 million. Virginia Tech is projecting to offer start-up packages ranging from \$23.3 million to \$31.3 million per year from 2016-2022.

Start-up packages are typically offered in research-intensive areas, such as engineering. Although start-up packages are highly competitive and can cost millions of dollars, based on interviews with management during the planning phase of the audit, VT would not be able to attract talented faculty without good incentives. Negotiations with candidates for a start-up package, salary, and benefits are very individualized. Generally, start-up package funds are paid over two or three years, although relatively small packages may be paid out over one year.

The University evaluates the overall performance and success of the faculty member receiving the start-up package on an individual level as part of the annual faculty review process and/or tenure review process. While external research funding is one indicator of faculty success, the impact of published scholarly works (articles, books, citations, awards, etc.) is also considered important. The Provost's Office staff also compares faculty research grant awards to total faculty start-up

⁷ Effective October 1, 2016, this Code section changes to § [23.1-305](#)

⁸ VT FY15 Financial Report, pg. 2

⁹ SCHEV reports, <http://research.schev.edu/apps/info/Reports.Guide-to-the-Degrees-Awarded-Reports.ashx>

¹⁰ Board of Visitors meeting minutes 9/11/15, Approval of 2016-2022 Six-Year Plan, Attachment K <http://www.bov.vt.edu/minutes/15-11-9minutes/Index.html>

package amounts, which allows management an opportunity to measure the return on investment (ROI) to the University, from an institutional viewpoint, for start-up package costs.

Transfer and Return of Collected Revenues

Virginia Tech is one of four universities classified as a “Tier III” university within the Commonwealth of Virginia and has been granted latitude in managing its operations and finances. The management agreement between the Commonwealth of Virginia and the University is contained within the 2009 Session *Virginia Acts of Assembly – Chapter 675 and Chapter 685* and states that the University shall have the power and authority to manage all monies received by it.

The transfer of collected revenue to the State Treasury is a Virginia Constitutional requirement (Article X, Section 7 – Collection and disposition of State revenues¹¹), although the Virginia Constitution does not specify how often these transfers must be made. The *Commonwealth Accounting Policies and Procedures (CAPP) Manual* (Topic 20205 – Deposits) specifies that State agencies and institutions receiving public funds belonging to or for the use of the Commonwealth or any State agency shall deposit such funds into the State Treasury on the day received or the next banking day. The CAPP Manual allows for an exception to the daily deposit requirement with the approval of the Department of the Treasury.¹²

Procurement

Procurement refers to the process of procuring goods and service to meet planned or actual demand. Procurement encompasses a broad range of issues that can include compliance with the Virginia Public Procurement Act, contract administration, purchasing authorization, processing of requisitions and purchase orders, small purchase charge card (P-card) transactions and Virginia’s electronic procurement system (eVA).

Virginia Tech’s Internal Audit Department performed a Procurement and Accounts Payable Audit in 2014 (no. 14-1150) and a Contract Administration Audit in 2016 (no. 16-1241). In addition, in 2014 the Joint Legislative Audit and Review Commission (JLARC) conducted a review of the development and management of state contracts. Since procurement contracts have had a sufficient level of independent review, OSIG chose not to review contracts and decided to focus on the University’s practice of eVA usage and related fees.

¹¹ <http://law.justia.com/constitution/virginia>

¹² http://www.doa.virginia.gov/Admin_Services/CAPP/CAPP_Topics/20205.pdf

Review Methodology

OSIG conducted this review by:

- Examining the detailed results of Deloitte’s statewide risk assessment
- Conducting interviews to gain insight into the specific concerns from within the risk areas with the:
 - Vice President for Finance and Chief Financial Officer
 - Vice Provost for Resource Management & Institutional Effectiveness
 - Vice Provost for Faculty Affairs
 - Interim Vice President for Research and Innovation
 - Associate Vice President for Research Programs
 - Associate Vice President for Research Planning
 - Assistant Vice President for Budget and Financial Planning
 - Assistant Vice President for Capital Assets and Financial Management
 - Assistant Vice President for Finance and University Controller
 - Assistant Vice President for Finance and Controls
 - Chief of Staff to the Vice President for Finance and Chief Financial Officer
 - Director of Internal Audit
 - Director of Procurement
 - Auditor of Public Accounts (APA) staff (for Virginia Tech)

As a result of the interviews, OSIG identified objectives (see [Purpose and Scope of the Review](#)), and developed detailed review procedures. Work associated with each of the objectives was accomplished primarily through discussions with appropriate departmental managers and reviewing relevant documentation.

The performance review procedures included:

- Reviewing the University’s enrollment growth projections including STEM-H disciplines and resource planning for new and existing facilities.
- Reviewing Virginia Tech’s faculty staffing plans to handle projected enrollment growth, including STEM-H disciplines.
- Reviewing and evaluating faculty turnover trends and the University’s strategy to improve faculty retention.
- Reviewing Virginia Tech’s process for the transfer and return of state revenues with the Department of the Treasury.
- Evaluating the University’s processes for monitoring the performance of individual start-up packages and expenditures.
- Reviewing the University’s use of the state’s electronic procurement system (eVA) and related fees.
- Evaluating whether preventive and detective controls were in place to identify symptoms of fraud, waste, and abuse and to follow-up for resolution, as needed.

Review Results

Overall, OSIG found that Virginia Tech's investment in STEM-H programs, faculty start-up packages, and transfer and return of collected revenue functions were operating efficiently and effectively. No conclusion is made regarding Virginia Tech's required use of and related fees paid for the State's electronic procurement system (eVA). The required use of eVA by Virginia Tech appeared to not benefit the University, however, the required use of eVA at all state agencies and institutions needs additional evaluation beyond that conducted at Virginia Tech. Therefore, a separate broader review of the eVA system statewide has been included by OSIG in the FY17 audit plan.

Investment in STEM-H Program

OSIG obtained an understanding of Virginia Tech's processes for evaluating enrollment growth, space utilization, and assessing the need for additional faculty from our interviews with management.

OSIG reviewed Virginia Tech's student growth projections by discipline. Targeted enrollment for 2015-2016 was expanded by 500 students which resulted in an actual growth of 800 freshmen.¹³ A new building under construction at the time of this review is an example of how Virginia Tech was addressing the need for additional classrooms and laboratory space. The building will provide classrooms that can be configured to support group work, and accommodate new instructional technologies while providing the opportunity for Virginia Tech to determine and complete needed renovations of current facilities. In addition, some high-volume introductory laboratories will move to the new facility while needed renovations are determined and completed for current laboratories.

OSIG also reviewed reports and surveys in use by University management which assist in establishing plans for capital projects and building renovations. OSIG found that Virginia Tech is assessing current and future needs including utilization and condition assessments of classroom and laboratory space. The University is also reviewing student feedback from classroom environment surveys, as well as requests from academic departments.

Virginia Tech is planning for a sufficient number of future instructors. Based on review of faculty projections, there is a correlation between the number of students expected and the number of instructors needed in the future. For example, the University maintains a metrics report providing trends on student needs for specific programs and the faculty required to address those needs. These trends then are used to develop strategic goals for matching the University's initiatives such

¹³ Virginia Tech Board of Visitors meeting minutes 3/20/16
http://www.bov.vt.edu/minutes/16-03-21minutes/Information_Session_03-21-16.pdf as accessed 9/15/16

as maintaining a high number of STEM-H programs. A low faculty turnover and high retention rate assist the University in meeting these goals.

As mentioned previously, over half of the Virginia Tech graduates in 2015 earned a STEM-H degree. OSIG concluded that Virginia Tech's process for assessing the need for faculty and infrastructure to accommodate the growing demand for STEM-H degrees is functioning effectively.

Faculty Start-up Packages

OSIG reviewed the Provost Office's established method of tracking faculty hires and their respective start-up packages, and the process for assessing the performance of start-up packages. At an institutional level, Virginia Tech compares inputs, such as start-up package funding, to outputs, such as external research awards and National Science Foundation (NSF) rankings. Management also evaluates individual start-up package performance through comparison with the faculty member's research grants as well as scholarly works, such as published journal articles, awards, books, and conference proceedings. Provost's Office records indicated that 48 faculty members, who had individual start-up packages greater than \$25,000, were hired in 2009 and 2010 with start-up packages valued at a total of \$10.9 million, while their research grant awards aggregated to \$62.3 million.

The review included evaluating the logic and variables used in producing the Provost Office's reports for tracking start-up packages and for projecting future start-up package costs. OSIG found Virginia Tech's process for authorizing the Colleges' hiring plans to be effective for controlling future faculty start-up package costs and limiting them to available revenue sources.

OSIG also reviewed start-up package expenditures for faculty members that left the University before the end of their contract term and verified that no expenditures were initiated after the employee's departure date.

COMMENDATION NO. 1 – EFFECTIVE MONITORING OF OUTCOMES

The Provost's Office has developed effective quantitative methods for monitoring start-up package outcomes and the University is receiving positive "return on investment" for faculty start-up package costs.

Transfer and Return of Collected Revenues

Through interviews with the University Controller, the Associate Controller and the General Accounting Manager, OSIG determined Virginia Tech's process for transferring state revenue collections to the State Treasury. OSIG reviewed a report of all daily wire transfers processed in fiscal year 2015. An analysis of the data showed that Virginia Tech processed 248 daily wire

transfers. The current procedures collectively require about 1.5 to 2 hours of labor each day and the University pays a \$2.50 fee for each wire transfer.

OSIG found similar procedures in a recent performance review of the University of Virginia (UVA). As a result, in December 2015, UVA’s Treasurer initiated a discussion with representatives from Virginia Tech, Virginia Commonwealth University (VCU), the Department of Accounts (DOA), and the Department of the Treasury (Treasury). The parties tentatively agreed that weekly revenue transfers would be an acceptable alternative to the daily process. During the examination of this process, Virginia Tech indicated that they will pursue a weekly revenue transfer process with the Department of Accounts and Treasury staff in conjunction with the other Tier III schools to finalize procedures for the weekly transfer process in an effort to reduce labor time and banking fees associated with depositing revenues to the State Treasury. OSIG encourages Virginia Tech to follow through with their plans to pursue a weekly revenue transfer process.

Electronic Procurement

All agencies are required to use the State’s e-procurement (eVA) system, with the exception of schools designated as “Tier III,” and all are required to pay eVA fees. Chapter 4.10 (§ [23-38.88](#) et seq.¹⁴) of Title 23 of the *Code of Virginia* allows schools with Tier III designation to utilize a separate e-procurement system for all procurement operations. However, the *Code* requires whatever system is used to interface with eVA and have at least 80 percent of transactions flow through eVA, with 75 percent of those going to eVA vendors. Furthermore, the management agreements further impose these schools to process 95 percent of all non-exempt orders within eVA.

Virginia Tech is designated as a “Tier III” university. Virginia Tech uses a SciQuest software application product as their electronic procurement system, known as “HokieMart.” SciQuest is a leading firm in procurement software for higher education institutions.¹⁵ Virginia Tech management confirmed that eVA is used primarily for transparency and *Code* mandated purposes, but they do use it additionally for public solicitations.

OSIG conducted a review of the Department of General Services (DGS) while the review of Virginia Tech was progressing. The DGS review included Tier III universities’ use of eVA and fees paid for the usage. The following is Virginia Tech’s transaction fees over the past three fiscal years, as well as the amount paid by Virginia Tech to SciQuest for support of their own HokieMart procurement system:

VIRGINIA TECH			
<i>Year</i>	<i>eVA Fees</i>	<i>SciQuest Fees</i>	<i>Total Fees</i>
2013	\$400,754	\$227,708	\$628,462

¹⁴ Effective October 1, 2016, this Code section changes to [§ 23.1-1002](#)

¹⁵ <https://www.universitybusiness.com/article/new-supply-chain>, accessed September 19, 2016

2014	\$369,127	\$227,708	\$596,835
2015	\$583,409	\$227,708	\$811,117
Total	\$1,353,290	\$683,124	\$2,036,414

Costs incurred annually for SciQuest usage relate to maintenance fees along with any voluntary enhancements (such as implementation of a new module) Virginia Tech chooses to purchase. Although eVA is primarily used for transparency in reporting, Virginia Tech pays significantly more towards eVA than they pay towards their own procurement system.

OSIG concludes that the use of eVA for electronic procurement is a broader issue than just the Tier III institutions and has included an evaluation of eVA from a broader perspective in OSIG's FY17 audit plan rather than making recommendations impacting only Virginia Tech.

Fraud, Waste and Abuse

As part of the performance review, OSIG considered the risk of fraud, waste and abuse. For the focus areas of this project, OSIG considered the risk of fraud to be low. No instances of possible fraud, waste, or abuse came to our attention during the review.