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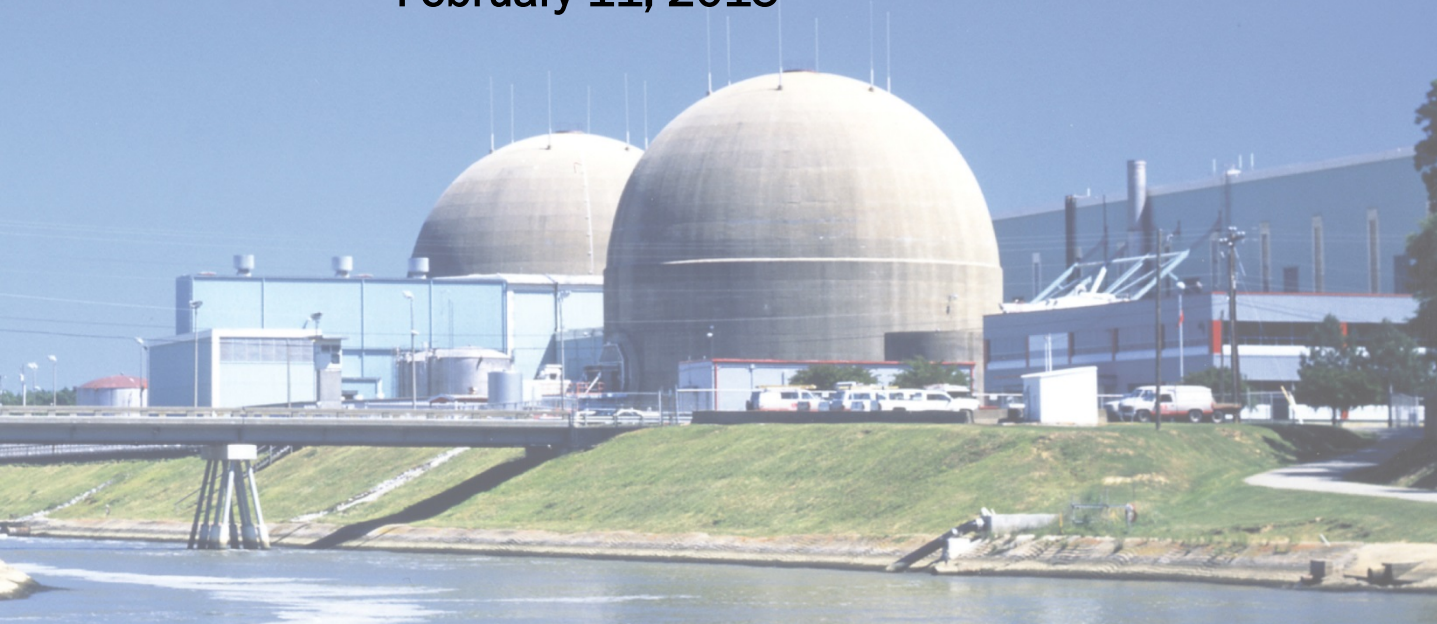
U.S. NUCLEAR REGULATORY COMMISSION

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Audit of NRC's Information Technology Procurement Process

OIG-15-A-09

February 11, 2015



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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

**OFFICE OF THE
INSPECTOR GENERAL**

February 11, 2015

MEMORANDUM TO: Mark A. Satorius
Executive Director for Operations

FROM: Stephen D. Dingbaum */RA/*
Assistant Inspector General for Audits

SUBJECT: AUDIT OF NRC'S INFORMATION TECHNOLOGY
PROCUREMENT PROCESS (OIG-15-A-09)

Attached is the Office of the Inspector General's (OIG) audit report titled *Audit of NRC's Information Technology Procurement Process*.

The report presents the results of the subject audit. Following the January 23, 2015, exit conference, agency staff indicated that they had no formal comments for inclusion in this report.

Please provide information on actions taken or planned on each of the recommendations within 30 days of the date of this memorandum. Actions taken or planned are subject to OIG followup as stated in Management Directive 6.1.

We appreciate the cooperation extended to us by members of your staff during the audit. If you have any questions or comments about our report, please contact me at (301) 415-5915 or Beth Serepca, Team Leader, at (301) 415-5911.

Attachment: As stated



Office of the Inspector General

U.S. Nuclear Regulatory Commission
Defense Nuclear Facilities Safety Board

OIG-15-A-09

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Results in Brief

Why We Did This Review

Cost-effective information technology (IT) procurement is critical as the Nuclear Regulatory Commission (NRC) aims to provide staff with technology that helps them perform their mission and manage information security risk, while also maintaining fiscal discipline in the face of declining resources.

There are several processes for procuring IT at NRC, depending upon variables such as transaction cost, availability through existing contracts, and similarity to products already in use at NRC.

The audit objective was to assess the effectiveness of NRC's IT procurement process in meeting the agency's current and future IT needs.

Audit of NRC's Information Technology Procurement Process

What We Found

NRC IT governance groups do not consistently apply investment criteria in reviewing and approving staff requests for new technology. Specifically, OIG found cases dating from 2010 to the present in which NRC purchased items to meet specific customer needs without establishing standardized selection criteria or applying such criteria to business case justifications for the procurements. Additionally, staff interviews and internal agency analysis corroborate a need for better coordination of IT procurement planning, budgeting, and prioritization.

What We Recommend

To strengthen NRC's IT procurement process, we make one recommendation to develop IT selection criteria, and one recommendation to educate staff on IT procurement criteria and NRC's IT governance structures.

Management stated their general agreement with the finding and recommendations in this report.

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ABBREVIATIONS AND ACRONYMS

AC	Architecture Council
FY	Fiscal Year
IPEC	Information Technology / Information Management Portfolio Executive Council
IT	Information Technology
ITB	Information Technology / Information Management Board
NRC	Nuclear Regulatory Commission
OIG	Office of the Inspector General
OIS	Office of Information Services
OMB	Office of Management and Budget

I. BACKGROUND

Cost-effective information technology (IT) procurement is critical as the Nuclear Regulatory Commission (NRC) aims to provide staff with technology that helps them perform their mission and manage information security risk, while also maintaining fiscal discipline in the face of declining resources. The need to “innovate with less”¹ is reinforced by trends in NRC’s annual IT spending, which decreased from approximately \$165 million in fiscal year (FY) 2011 to approximately \$152 million in FY 2015.² This spending supports mission and management data systems, such as NRC’s incident response, official agency recordkeeping, and core financial accounting systems. Infrastructure services and support—which includes maintenance of NRC computer and telecommunication networks across agency headquarters, regional, and resident inspector offices—accounts for the largest single line item at \$71 million, or 46 percent of NRC’s total FY 2015 IT budget.

¹ The Office of Management and Budget (OMB) has directed Federal agencies to “innovate with less” by ending low priority and duplicative IT investments. See OMB Memorandum M-12-10, *Implementing PortfolioStat*, March 30, 2012.

² In February 2014, senior NRC management announced a series of IT product and service cutbacks driven by budgetary constraints. These included a 25-percent reduction in the headquarters IT purchase card budget, deferral of technology initiatives such as alternative mobile devices and enterprise Wi-Fi access, and termination of project management and business analysis support services.

IT Governance Groups at NRC

NRC has three principal governance³ groups that provide oversight of the agency's IT planning and funding:

- The Information Technology/Information Management Portfolio Executive Council (IPEC) manages NRC's IT portfolio⁴ at the strategic level and sets current fiscal year funding priorities. The IPEC is co-chaired by NRC's Chief Information Officer and Chief Financial Officer, and its voting members are NRC office directors. Advisory members provide input on contracting, finance, operations, and security issues, but do not have a voting role in IPEC decisionmaking.
- The Information Technology/Information Management Board (ITB) reviews and recommends changes to the agency's IT portfolio based on the agency's mission and business needs, and provides resourcing and investment⁵ recommendations to the IPEC. The ITB is co-chaired by a branch chief from the Office of Information Services (OIS) and one program office representative who rotates biennially. Other voting members include branch chiefs and deputy division directors from various headquarters and regional offices. The ITB also has non-voting advisory members from OIS, the Office of Administration's Acquisition Management Division, and NRC's Technical Training Center.

³ In December 2013, NRC's Office of the Inspector General (OIG) issued audit report OIG-A-14-04, *Audit of NRC's Information Technology Governance*. This report is publicly available in the NRC Agencywide Documents Access and Management System. See <http://pbadupws.nrc.gov/docs/ML1334/ML13343A244.pdf>.

⁴ NRC's IT portfolio includes all IT investments, both existing and in development. The NRC portfolio is the enterprise—i.e., agencywide—view of the history and future of NRC IT investments. Key IT management activities at this level include scanning for new industry and Federal Government developments, technical program portfolio analysis, development of transition strategies to move NRC from the current state to a target state, and compilation and submission of NRC's IT budget.

⁵ IT investments are activities and acquisitions that focus on achieving an interrelated set of organizational goals in support of NRC's mission, and in accordance with NRC's target architecture. Key activities at this level include the identification, sponsorship, preparation, planning, and selection of IT investments within the context of the NRC transition strategy, development of investment business cases, update and maintenance of IT investment documentation, and the monitoring of investment performance.

- The Architecture Council (AC) oversees IT projects⁶ and infrastructure, provides technology analysis to NRC's Chief Information Officer and the ITB, and serves as a forum for discussing technological innovation. The AC also evaluates proposed projects to determine whether the projects will fit within the agency's enterprise architecture.⁷ The AC is also tasked with ensuring that standardized methods and procedures are used for efficient and prompt handling of all changes to enterprise services and projects. The AC is composed of OIS and Computer Security Office staff who represent functional areas such as customer service, operations, systems engineering, security, and acquisitions.

The IPEC and AC charters outlining objectives, responsibilities, and organizational relationships were undergoing revision at the time of this audit. The ITB charter was revised in June 2014.

IT Procurement Processes at NRC

There are several processes for procuring IT at NRC, depending upon variables such as transaction cost, availability through existing contracts, and similarity to products already in use at NRC. The following points offer general summaries of different procurement processes.

- **Micropurchases:** Purchase cards are used for transactions worth \$3,000 or less. Purchase requests undergo supervisory review to ensure they meet legitimate business needs, do not duplicate items already in inventory, and have funding available. Micropurchases at NRC headquarters are subject to quarterly audits, and micropurchases at NRC regional offices are audited annually.⁸

⁶ IT projects are temporary endeavors that support development for investments. Projects cover a range of types, including new development, operations and maintenance, service delivery, and organizational strengthening.

⁷ Enterprise architecture provides a clear and comprehensive picture of current and proposed technical environments, and a roadmap for transitioning from the current to the target technical environment. When properly managed, enterprise architecture can help optimize the relationships among an organization's business operations and the IT infrastructure and applications supporting them.

⁸ During OIG's audit, NRC staff were reportedly revising the agency's purchase card handbook to strengthen controls over IT micropurchases.

- **Purchases worth more than \$3,000:** Staff may procure items unavailable through purchase card orders by creating new standalone contracts, or by issuing orders under existing contracts. Creating new contracts entails considerable administrative burden and can delay procurements, so staff are encouraged to consult with Office of Administration acquisitions specialists to determine the best option. In some cases, staff can use enterprisewide contracts to expedite requisitions and help NRC obtain better pricing than that available through standalone contracts.⁹
- **New technology requests:** Staff may requisition new IT by submitting change requests to OIS staff, who determine whether a product meets agency technical standards.¹⁰ Standard changes, such as required security patches, upgrades to approved hardware and software, or mission-related hardware and software deployed on a limited scale, are generally reviewed and approved within a few days. Requests for new, non-standard technology must undergo technical review by the AC, which may refer cases with significant resource impacts to the ITB for review. All changes must be tested, validated, and evaluated in an accepted test environment.
- **Expedited requests:** Some IT procurement requests undergo expedited review by the AC. Urgent security needs are one basis for expedited review, as are event-driven needs like NRC's response to Fukushima. Requests from senior NRC personnel may also be "fast tracked"; however, this requires direction from the Deputy Chief Information Officer and Chief Information Security Officer.

⁹ NRC also uses interagency agreements, such as agreements with Department of Energy laboratories, to procure goods and services not available through commercial contractors, including IT such as specialized software development.

¹⁰ NRC maintains these standards in its Technical Reference Model, which serves as a catalog of products approved for use at NRC. Staff told auditors that NRC was in the process of reducing the number of products listed in the Technical Reference Model to eliminate duplicative technologies and promote standardization among items that perform similar functions.

IT Procurement Initiatives at NRC

During this audit, NRC was undertaking several initiatives to improve IT procurement. During October 2014, staff announced a near-term plan to reduce print and copy expenses pending a longer-term procurement and device management strategy to be implemented in 2015. Additionally, OIS staff were revising the change request process to reduce backlogs of pending requests, with a goal of further expediting the process through automation. Lastly, the ITB integrated budget formulation with IT prioritization, tested this new approach in developing a FY 2016 budget proposal, and conducted a lessons-learned analysis of this exercise to help the FY 2017 exercise.

II. OBJECTIVE

The audit objective was to assess the effectiveness of NRC's IT procurement process in meeting the agency's current and future IT needs. The report appendix provides information on the audit's scope and methodology.

III. FINDING

NRC Could Improve New IT Procurement With Well Defined and Better Understood Investment Criteria

NRC has governance groups that review IT investments in the planning, development, and operational stages. The agency is also taking steps to streamline and improve the cost-effectiveness of its IT procurements. However, NRC could more effectively meet agencywide IT needs by developing and applying investment criteria, and by communicating these criteria to all staff involved in the IT procurement process.

NRC IT governance groups should apply IT investment criteria that are well defined and understood by all staff involved in the IT procurement process. NRC IT governance groups do not consistently apply these investment criteria in reviewing and approving staff requests for new technology. This occurs because NRC IT governance groups lack standardized technical and financial selection criteria. As a result, IT items are sometimes deployed without full functionality and NRC does not always realize full return on its procurement investment.

What Is Required

IT Investment Criteria Should Be Defined and Understood

NRC should apply IT investment criteria that are well defined and understood by all staff involved in the IT procurement process. This includes staff seeking to procure new IT, as well as those serving on governance groups that evaluate and approve procurement requests. In its best practices for IT portfolio planning and development, the U.S. Government Accountability Office recommends that organizations define investment criteria and apply those criteria in the selection process. These criteria may include qualitative or quantitative factors such as cost, benefit, schedule, and risk.

What We Found

NRC Does Not Consistently Apply Best Practices for IT Investment Criteria

NRC IT governance groups do not consistently apply investment criteria in reviewing and approving staff requests for new technology. Specifically, OIG found cases dating from 2010 to the present in which NRC purchased items to meet specific customer needs without establishing standardized selection criteria or applying such criteria to business case justifications for the procurements. Additionally, staff interviews and internal agency analysis corroborate a need for better coordination of IT procurement planning, budgeting, and prioritization.

The following cases illustrate the condition found by auditors, but are not intended to be representative of all NRC IT procurement actions.

- Alternative laptops based on a different operating system than standard-issue NRC laptops were procured through an expedited process for limited use by senior personnel. These laptops require dedicated technical support because of their difference from

standard-issue laptops.¹¹ After the initial procurement of seven devices, NRC staff and contractors analyzed potential use of the alternative laptops on an agencywide scale, but found significant cost and technical challenges. Specifically, staff estimated the cost of procuring and operating the limited number of laptops at approximately \$800,000 per year. At the time of this audit, use of supported alternative laptops remained limited to senior personnel.

- Tablets were procured for a proof-of-concept trial by a program office. Staff presented a business case analysis to the ITB, which included user needs, functional requirements, and analysis of total ownership costs associated with deploying tablets for a 5-year period, which varied between \$470,000 and \$748,000 for the models that were selected. The ITB conditionally approved the devices, and NRC procured 12 tablets (6 each of 2 different brands). However, technical matters pertaining to security and network integration were not resolved prior to device deployment. The proof-of-concept tablet deployment was conducted separately from a broader agencywide mobile device initiative and, at the time of this audit, the tablets were not being used as networked devices.
- Security hardware and software was procured initially on a trial basis because NRC, at that time, had not yet decided whether to implement the specific technology. Contract documents show that licenses for the hardware and software have been renewed annually for 3 years at a total cost of approximately \$109,000, but the products reportedly remain in beta testing mode for staff training purposes.
- File management software was procured with a 3-year contract worth approximately \$24,300 after receiving conditional approval from the ITB for limited use, with questions raised by ITB members regarding security and technical support requirements. Nearly 11 months into the contract, NRC staff were following up to determine whether issues raised by ITB members during review of the procurement have been resolved.

¹¹The ITB gave limited approval to this procurement request, but records do not show the basis for this decision.

Auditors' reviews of ITB and AC records, as well as interviews with staff who have participated in these governance boards, show staff concern for greater consistency and discipline in the IT procurement process. Additionally, agency management has expressed desire for agency governance boards to have more effective authority—specifically, the authority to reject procurements that do not align with agencywide goals.

Why This Occurred

IT Governance Groups Lack Standardized Selection Criteria

IT governance groups do not consistently apply investment criteria in reviewing requests for new IT because they lack standardized technical and financial selection criteria. Members of NRC's IT governance groups demonstrate understanding of key issues such as security, technical support requirements, total ownership costs, and enterprise architecture. However, these types of issues are not formalized and communicated to stakeholders in policy that would foster consistent IT investment review and staff awareness of the standards by which IT procurement requests are approved or rejected.

Why This Is Important

IT Products Sometimes Lack Full Functionality, Do Not Optimize Return on Investment

The lack of defined selection criteria and rigorous application of such criteria to the IT investment selection process has led to items being procured and deployed without full functionality or put to limited use. Additionally, some product deployments have resulted in end users losing features that could potentially enhance their work. As a further consequence, the agency has not always realized a full return on its procurement investment.

Recommendations

OIG recommends that the Executive Director for Operations

1. Develop and implement selection criteria for use by the ITB and other IT governance groups in reviewing IT procurement proposals.
2. Develop and implement a communication plan to educate NRC customers on IT procurement criteria and the role of NRC's governance structures in reviewing and approving IT procurement proposals.

IV. AGENCY COMMENTS

An exit conference was held with the agency on January 23, 2015. Prior to this meeting, agency management reviewed a discussion draft and provided technical comments that have been incorporated into this report, as appropriate. As a result, agency management opted not to provide formal comments for inclusion in this report.

OBJECTIVE, SCOPE, AND METHODOLOGY

Objective

The audit objective was to assess the effectiveness of NRC's IT procurement process in meeting the agency's current and future IT needs.

Scope

This audit focused on the process by which NRC headquarters and regional staff procure IT products. We conducted this performance audit from June 2014 through December 2014 at NRC headquarters in Rockville, MD, and regional offices via telephone. Internal controls related to the audit objective were reviewed and analyzed. Throughout the audit, auditors were aware of the possibility of fraud, waste, and abuse in the program.

Methodology

To address the audit objective within the scope of this audit, OIG auditors analyzed the following Federal and agency guidance, and key data and documents:

- Federal Acquisition Regulation.
- Office of Management and Budget Memorandum M-12-10, *Implementing PortfolioStat*, March 30, 2012.
- U.S. Government Accountability Office: *Best Practices and Leading Practices in Information Technology Management*.
http://www.gao.gov/key_issues/leading_practices_information_technology_management/issue_summary
- NRC Strategic Plan for Fiscal Years 2014-2018.

- Management Directive 11.1, *NRC Acquisition of Supplies and Services*.
- Management Directive 11.7, *NRC Procedures for Placement and Monitoring of Work with the U.S. Department of Energy*.
- Management Directive 2.8, *Project Management Methodology*.
- NRC IT governance organization charters.
- NRC IT governance organization meeting minutes.
- NRC IT budget planning and spend analysis documents.
- NRC IT procurement process flow charts.
- Commercial contracts and Department of Energy laboratory agreement contracts.

Additionally, OIG auditors conducted in-person and telephone interviews with NRC staff representing the Office of Information Services, the Office of Administration (Acquisitions Management Division), the Computer Security Office, the Office of New Reactors, the Office of Nuclear Regulatory Research, and the four NRC regional offices.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The work was conducted by Beth Serepca, Team Leader; Paul Rades, Audit Manager; Nandini Sharma, Auditor; Lucky Singh, Auditor; and Andrew Pham, Student Analyst.

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COMMENTS AND SUGGESTIONS

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