



OFFICE OF THE INSPECTOR GENERAL

U.S. NUCLEAR REGULATORY COMMISSION

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Evaluation of NRC's Oversight of the Voice over Internet Protocol Contract and Implementation

OIG-19-A-17

SEPTEMBER 5, 2019



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

**OFFICE OF THE
INSPECTOR GENERAL**

September 5, 2019

MEMORANDUM TO: Margaret M. Doane
Executive Director for Operations

FROM: Dr. Brett M. Baker */RA/*
Assistant Inspector General for Audits

SUBJECT: EVALUATION OF NRC'S OVERSIGHT OF THE VOICE
OVER INTERNET PROTOCOL CONTRACT AND
IMPLEMENTATION (OIG-19-A-17)

Attached is the Office of the Inspector General's (OIG) evaluation report titled *Evaluation of NRC's Oversight of the Voice over Internet Protocol Contract and Implementation*.

The report presents the results of the subject evaluation. Following the August 28, 2019, 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 evaluation. If you have any questions or comments about our report, please contact me at (301) 415-5915 or Paul Rades, Team Leader, at (301) 415-6228.

Attachment: As stated



Office of the Inspector General

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

OIG-19-A-17

September 5, 2019

Results in Brief

Why We Did This Review

In the fall of 2018, NRC began the agency-wide transition to a Voice over Internet Protocol (VoIP) telephony solution as part of a larger telecommunications infrastructure modernization effort that would enhance communication capabilities, replace legacy systems and introduce significant cost savings. VoIP, or Internet telephony, combines the familiar features of a telephone with Internet technology. Therefore, instead of using an analog connection between callers, VoIP securely sends digital packets containing audition or voice information over the Internet using a broadband connection.

The Office of the Chief Information Officer was responsible for overseeing and coordinating the transition to VoIP including pilot testing, physical deployment of new phones, and communicating special instructions and updates on the process to agency staff. With the exception of the Headquarters Operations Center, all agency offices and regions were transitioned to VoIP by early 2019.

The objective was to evaluate the NRC VoIP deployment, the relevant contracts, and the functionality of the new equipment, in order to identify any opportunities for improvement and solutions moving forward.

Evaluation of NRC's Oversight of the Voice over Internet Protocol Contract and Implementation

What We Found

The evaluation identified two areas for improvement pertaining to the contracting and deployment approaches used to implement VoIP. Particularly, the roles and responsibilities of the respective telecommunications contractors were not specified, and the telecommunications contracts had duplicative services. This was a result of the contracts not being clearly written and a lack of coordination among NRC offices involved in VoIP transition. As a result, there is the perception that contractors are not performing satisfactorily, and NRC is paying for additional services.

Additionally, the evaluation found that the VoIP transition was poorly implemented as a result of poor project planning. Consequently, agency communications were unduly impacted, and concerns remain for future IT transitions.

What We Recommend

This report makes six recommendations to address clarity in telecommunications contracts, and the planning and implementation of large-scale information technology deployments. Agency management stated their general agreement with the findings and recommendations in this report.

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS	i
I. BACKGROUND	1
II. OBJECTIVE	6
III. FINDINGS	6
A. Contractor Roles and Responsibilities Are Not Clearly Defined and Telecommunications Contracts Contain Duplicative Services	6
B. NRC's VoIP Transition Was Poorly Planned and Implemented	10
IV. OTHER ISSUE	19
V. CONSOLIDATED LIST OF RECOMMENDATIONS	21
VI. AGENCY COMMENTS	22
 APPENDIXES	
A. OBJECTIVE, SCOPE, AND METHODOLOGY	23
 TO REPORT FRAUD, WASTE, OR ABUSE	25
COMMENTS AND SUGGESTIONS	25

ABBREVIATIONS AND ACRONYMS

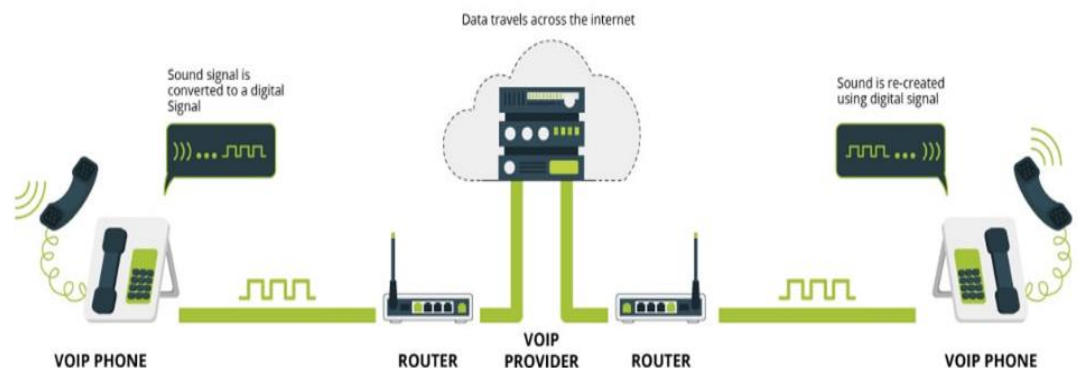
3Links	3links Technologies, Inc.
COR	Contracting Officer's Representative
CSC	Customer Service Center
EUC	End User Computing
GSA	General Services Administration
IT	Information Technology
MD	Management Directive
NiOS	Network Inventory and Optimization Solutions (NiOS)
NRC	US Nuclear Regulatory Commission
OCIO	Office of the Chief Information Officer
OIG	Office of the Inspector General
TOSS	Telecommunications Operations and Support Services
Turning Point	Turning Point – DS Federal J.V., LLC
VoIP	Voice over Internet Protocol
WITS 3	Washington Interagency Telecommunications System 3

I. BACKGROUND

What is Voice over Internet Protocol (VoIP)

VoIP is a technology that allows you to make voice calls using a broadband internet connection instead of a regular (or analog) phone line. VoIP service converts your voice into a digital signal that travels over the internet. VoIP can allow you to make a call directly from a computer, a special VoIP phone, or a traditional phone connected to a special adaptor. Figure 1 is a simple depiction of how the VoIP technology works.

Figure 1: How VoIP Technology Works

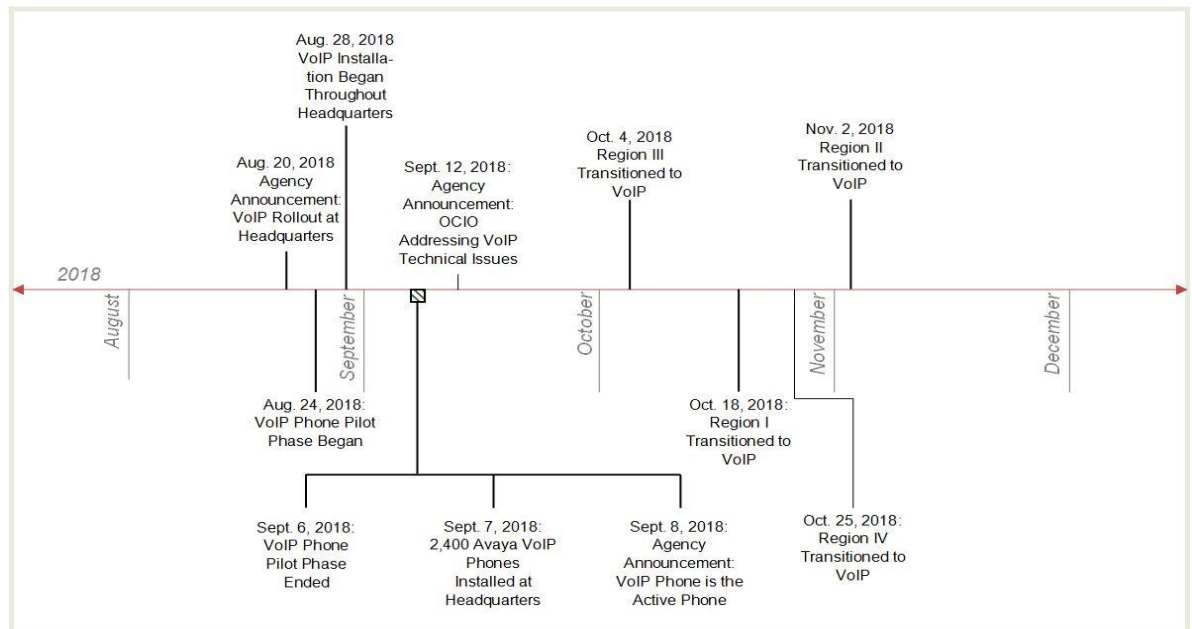


Source: Epik networks (Link: <https://www.epiknetworks.com/what-is-voip/>)

NRC Transition to VoIP

The primary benefits of implementing VoIP were to transition NRC to a modern telephony system with better conferencing features; improved voice quality; and more reliability at headquarters, the regions, Technical Training Center, and resident inspector sites. The VoIP project was initiated on October 31, 2017, with the expectation that about 2,900 phones would be deployed at NRC headquarters (Rockville, MD) and an additional 1,000 phones in the regions and at the Technical Training Center. Deployment of the VoIP system and phones began on September 7, 2018, and continued through March 29, 2019. Figure 2 shows a timeline of the VoIP deployment.

Figure 2: Timeline of Important Dates for VoIP Deployment at Headquarters and the Regional Offices



Source: OIG generated.

Telecommunications Contracts

NRC has multiple contracts that support its telecommunications infrastructure. There are five contracts providing services and products associated with NRC's telecommunications and each of these contracts has a Contracting Officer's Representative (COR).

A. Washington Interagency Telecommunications Systems 3 (WITS 3)

The WITS 3 contract (awarded to Verizon in October 2013) offers a portfolio of commercial services and products and allows Federal customers to choose from a variety of telecommunications services available in the Washington, DC and surrounding Maryland and Virginia counties. It is managed by the National Capital Region Network Services Division in the General Services Administration (GSA).¹

¹ National Capital Region is a division in GSA responsible for supporting workplace needs through the acquisition of office space, equipment, telecommunications and information technology in the Washington, DC metropolitan area.

NRC uses the services and products under WITS 3 through an interagency agreement with GSA. In September 2017, a contract line item (CLIN)² was added to WITS 3 to include VoIP services for NRC. Verizon subcontracted with Avaya to assist in fulfilling the obligations, for VoIP services, in the WITS 3 contract.

NRC expects that in 2020, WITS 3 will be replaced by the Enterprise Information Solutions Contract.

B. Telecommunications Operations and Support Services (TOSS)

The TOSS contract was awarded to 3Links Technologies, Inc. (3Links), and provides several telecommunications services to NRC. These services include 1) providing comprehensive operational support of data, voice, and cable TV/broadband service in the headquarters building; 2) performing infrastructure wiring between devices such as hubs, routers, servers, desktop workstations, televisions, antennas, and telephones; and 3) completing new telecommunication requirements as they develop.

C. Telecommunications Inventory and Invoice Audit Services

The Telecommunications Inventory and Invoice Audit Services Contract was awarded to Turning Point – DS Federal J.V., LLC (Turning Point). This contract assisted NRC by performing an audit of the telecommunications services and equipment; validating that the equipment and services were still necessary; identifying areas where services or components can be optimized to save costs; and identifying any process improvements for reviewing telecommunications services. Turning Point produced an audit report and a business process improvement report to address their findings and recommendations for improvement.

D. Network Inventory and Optimization Solutions Application and Related Support Services (NiOS)

The NIOS contract was also awarded to Turning Point and provides NRC with a time and expense management system application and support services. These services include the installation, administration, and

² A CLIN is the basic structural element in a procurement instrument that describes and organizes the required product or service for pricing, delivery, inspection, acceptance, invoicing, and payment.

maintenance to manage its telecommunications and data communications requirements, including automated inventory management, invoice verification, and usage analysis. NiOS updates inventory in real-time through automated validation of invoices, order completion notices, orders and contracts.

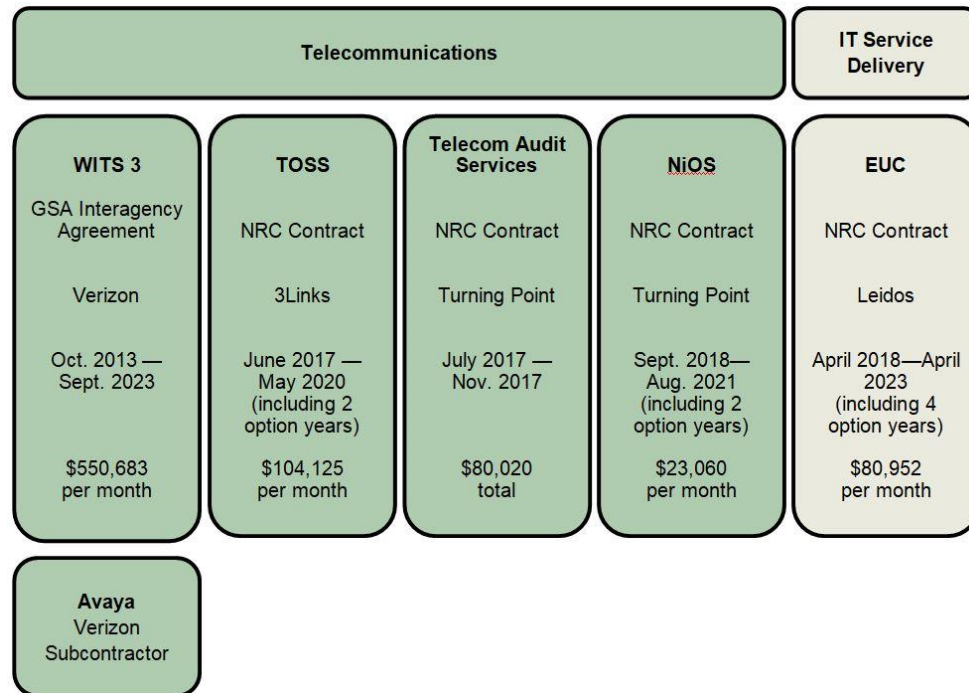
E. End User Computing Contract

The End User Computing (EUC) contract is a part of NRC's larger information technology (IT) contract, Global Infrastructure Development Acquisition contract³, and is serviced by Leidos. Leidos is responsible for responding to customer service center (CSC)⁴ tickets, based upon a multi-tiered support system. Leidos staff provides the initial support for a customer service center ticket, and then transfers it to the responsible contractor for resolution. Figure 3 depicts the NRC telecommunications contracts described above in paragraphs A – E.

³ The Global Infrastructure Development Acquisition contract is a multi-award, blanket purchase agreement covering application operations and maintenance, data center and cloud services, end-user computing, information security, and the network.

⁴ Problems with the telecommunications infrastructure are reported by users to NRC's CSC. The CSC help desk provides a single point of contact for headquarters user questions and service requests, coordinates support activities with other support components, and confirms customer satisfaction with service provided. This is the initial point of contact for end-user problem reporting. The contractor will generally receive trouble tickets directly from the CSC, via the *Remedy* trouble ticket system.

Figure 3: NRC Telecommunications Contracts⁵



Source: OIG generated.

Responsible NRC Offices

The Office of the Chief Information Officer (OCIO)

The IT Services Development and Operations Division, within OCIO, oversees and manages the entire IT service lifecycle, including design, development process, deployment, and maintenance support. This division was primarily responsible for the VoIP project and deployment. Additionally, the relevant project managers and CORs work in this division.

The Office of Administration

The Acquisition Management Division, within the Office of Administration, is responsible for directing, coordinating, and conducting contracting and interagency agreements. With respect to the VoIP project, it also administers the associated telecommunication contracts and the WITS 3 interagency agreement with GSA.

⁵The VoIP CLIN accounts for \$250,682.81 of the GSA interagency agreement monthly costs.

II. OBJECTIVE

The objective was to evaluate the NRC Voice over Internet Protocol (VoIP) deployment, the relevant contracts, and the functionality of the new equipment, in order to identify any opportunities for improvement and solutions moving forward. Appendix A contains information on the evaluation scope and methodology.

III. FINDINGS

OIG evaluated the VoIP implementation and its effect on agency operations. OIG identified opportunities for improvement in how the agency manages its telecommunications infrastructure. Specifically, OIG found that contract services and contractor roles and responsibilities are not clearly defined and that the telecommunications contracts contain duplicative services. Additionally, OIG found the transition to VoIP was poorly planned and implemented. OIG makes six recommendations to clarify contractor roles in current telecommunications contracts, and better prepare the agency for future IT or telecommunications projects and deployments.

A. Contractor Roles and Responsibilities Are Not Clearly Defined and Telecommunications Contracts Contain Duplicative Services

For effective and efficient organizational operation, management should assign responsibilities to discrete units and communicate information to staff in order to perform key roles in achieving objectives. However, the roles and responsibilities of the VoIP telecommunications contractors are not appropriately defined, and their respective contracts contain duplicative services. This occurred because the VoIP CLIN and the TOSS contract are not clearly written, and there was a lack of coordination among the CORs in issuing requests for quotation. As a result, there was confusion regarding responsibility for deployment of the VoIP phones

which resulted in NRC having to pay an additional contractor to install the phones by the identified deadlines.

What Is Required

Government Accountability Office, *Standards for Internal Control in the Federal Government*

Management should establish an organizational structure necessary to enable an entity to plan, execute, control, and assess the organization in achieving its objectives. The organizational structure should be developed with an understanding of the overall responsibilities, and responsibilities should be assigned to discrete units to enable the organization to operate in an efficient and effective manner.

Management should also internally communicate quality information down and across reporting lines to enable personnel to perform key roles in achieving objectives.

What We Found

The Roles and Responsibilities of Contractors Are Not Appropriately Defined

OIG found an inconsistent understanding between NRC, Verizon, and 3Links, regarding the roles and responsibilities of the VoIP contractors. Specifically, it was unclear which contractor was responsible for physically installing the VoIP phones on the desks at headquarters. OCIO staff scheduled the VoIP phone deployment to begin in August 2018 believing it was a contractual responsibility of Verizon. However, Verizon did not think it was responsible for installing the VoIP phones, and ultimately, did not physically deploy the VoIP phones. As a result, NRC had to implement the TOSS contract at the last minute to install the VoIP phones.

Duplicative Services Under the Telecommunications Contracts

Duplicative services in the VoIP Statement of Requirements and TOSS contract include

- maintaining the telecommunications infrastructure, including moves, adds, and changes.
- maintaining the voice infrastructure hardware, including voicemail management and voice services.

Duplicative services in the TOSS and EUC contracts include

- maintaining NRC's cable infrastructure.

Duplicative services in the VoIP CLIN and EUC contract include

- providing Tier I Mobility Service support on tickets in Remedy.⁶

Why This Occurred

VoIP CLIN is Unclear and Too Broad

Contract language for the VoIP CLIN is unclear and too broad to attribute specific responsibilities to contractors for VoIP services. The VoIP CLIN does not clearly define the work for which Verizon is responsible or the different performance objectives Verizon must meet.

Lack of Coordination in Issuing Requests for Quotes

NRC had multiple independent telecommunications systems throughout the headquarters and regional offices. In 2016, OCIO staff began reviewing the costs of maintaining multiple telecommunications systems at NRC. The staff realized savings could be attained through a centralized telecommunications infrastructure. In March 2017, OCIO staff initiated the VoIP CLIN and worked with GSA until it was determined the CLIN was logical. The VoIP Statement of Requirements was officially revised and

⁶ Remedy is NRC's ticketing system for tracking end-user issues and requests.

effective in September 2017. However, 3 months prior, in June 2017, the TOSS contract extension and EUC contract award, which also provides related telecommunications services affected by VoIP, occurred. Despite efforts to save the agency money, and recognition that the telecommunications contracts would change, OCIO staff did not review the contracts to identify overlaps between the contractors' services. The duplicative services went unnoticed for 13 months.

Some CORs are unfamiliar with the requirements in their telecommunications contract as well as the requirements in other telecommunications contracts, that may relate to their own contract. Though their contractors were involved in the overall VoIP project, the CORs did not sufficiently coordinate activities at any point during the contracting process.

Why This Is Important

Perception Contractors Performing Unsatisfactorily

NRC contacted GSA for mediation on the VoIP CLIN to address perceived contractor performance deficiencies with Verizon. Among other issues, NRC staff reported that Verizon contractors did not develop documents to prepare for the agencywide VoIP transition, physically install or program the VoIP phones, and conduct site surveys of the network. After careful review, GSA determined Verizon was performing the work in the firm-fixed price CLIN. As such, NRC cannot recover any costs. OCIO staff are in the process of clarifying the roles of the contractors in the VoIP Statement of Requirements and TOSS Statement of Work to stipulate the expectations, roles and responsibilities of each contractor.

NRC Incurred Additional Costs to Carry Out VoIP Deployment

Per GSA, Verizon was not contractually obligated to physically deploy the VoIP phones. Therefore, OCIO staff had to request 3Links to assist in installing the VoIP phones on desks throughout headquarters. A few days before the VoIP pilot in August 2018, NRC modified the TOSS contract to increase the ceiling for special projects in Option Year 1 by \$103,568.50, for 3Links to physically install the VoIP phones throughout headquarters.

If the agency does not take expedient action to clarify contractor roles and responsibilities, future confusion can ensue, resulting in NRC incurring more costs to address coverage gaps.

Recommendations

OIG recommends that the Executive Director for Operations

1. In all current telecommunications contracts, a) clarify contractor roles and responsibilities, and b) consult legal counsel to review the telecommunications contracts collectively to eliminate gaps and duplication in services.
2. Establish a policy for all new telecommunications contracts, and future modifications to current telecommunications contracts, that CORs must review the roles and responsibilities of all related contracts to prevent gaps and duplication in services.

B. NRC's VoIP Transition was Poorly Planned and Implemented

NRC's transition to the VoIP system was poorly implemented. Federal standards require that agencies manage and mitigate the risks to their information, system operations, and continuity of essential operations when deploying VoIP systems. Additionally, Federal agencies must provide reasonable accommodations to persons with disabilities. The poor implementation was the result of insufficient planning, a poorly designed pilot program, lack of testing of the system and telecommunications expertise, and outdated guidance. As a result, agency communications were unduly impacted, and concerns remain for future IT transitions.

What Is Required

National Institute of Standards and Technology (NIST) Requirements

NIST SP 800-53 SC-19 states organizations should establish usage restrictions and implementation guidance for VoIP technologies based on the potential to cause damage to the information system if used

maliciously; and, authorizes, monitors, and controls the use of VoIP within the information system. Also, NIST SP 800-58 recommends organizations examine and acceptably manage and mitigate the risks to their information, system operations, and continuity of essential operations when deploying VoIP systems. These issues should be considered for all systems but are especially important with VoIP deployment for essential operations, such as systems designated "high" under *Standards for Security Categorization of Federal Information and Information Systems*.

Rehabilitation Act of 1973, as amended and NRC's Directive

The Rehabilitation Act of 1973 as amended, Section 501 requires that Federal agencies have a program for the hiring, placement, and advancement of individuals with disabilities. The plan must include a description and methods whereby the special needs of employees who are individuals with disabilities are being met. Additionally, NRC's Management Directive (MD) 10.162 "Disability Program and Reasonable Accommodation" states that it is the policy of NRC to provide equal employment opportunity and reasonable accommodation to qualified employees and to applicants with disabilities.

What We Found

The VoIP Deployment Characterized as "Mayhem"

NRC staff characterized the transition to the VoIP system as "mayhem." The chaotic transition led to hundreds of customer service ticket requests, network and system outages, a challenging deployment of the VoIP equipment, and the needs of those with reasonable accommodations not being met in a timely manner.

Customer Service Tickets

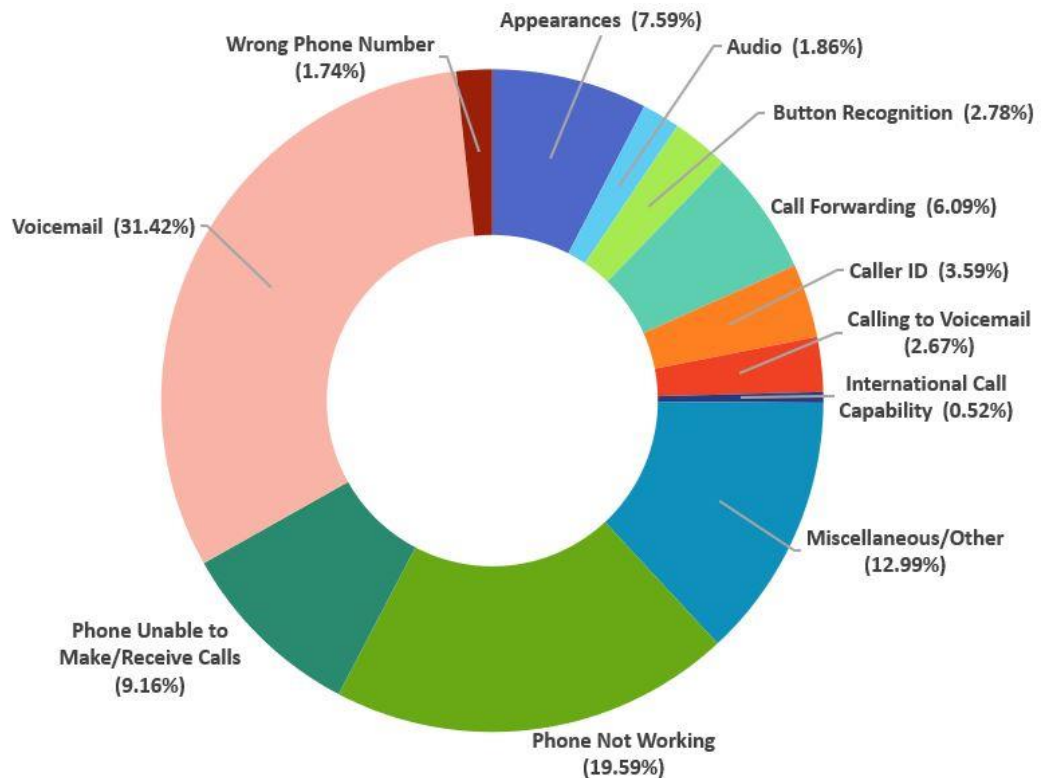
Approximately 1,725 customer service tickets were submitted to the CSC from August to December 2018, with staff reporting many types of problems. The following bulleted list shows the most commonly occurring problems.

- Voicemail Incidents (542 occurrences, 31%)

- Phone Not Working (338 occurrences, 20%)
- Miscellaneous/Other (224 occurrences, 13%)
- Phone Unable to Make/Receive Calls (158 occurrences, 9%)

These problems are illustrated in Figure 4 below, which depicts all issues reported to the CSC between August and December 2018.

Figure 4. Issues Reported to the CSC



Source: OIG generated.

Network and System Outages

A series of network outages from November 2018 through February 2019 affected the NRC's headquarters and regional offices. These outages lasted from several hours to several days in some areas. For example, an announcement on November 6, 2018, at 12:39 p.m., stated that the OCIO continued to work with Verizon to resolve the network outage at Region I. The outage impacted connectivity to the internet and NRC enterprise services such as Email, Skype for Business, Telephones and other headquarters hosted applications and services. Users at NRC

headquarters and other regional sites could not email, call or Skype with Region I users. An announcement on November 7, 2018, at 9:00 a.m., stated the issue was resolved.

On November 7, 2018, at 8:51 a.m., an announcement stated that a telephone outage was in effect for the NRC emergency and non-emergency lines in the Central Alarm Station. At 10:00 a.m. on the same day, another announcement was made communicating that the telephone outage for the NRC emergency and non-emergency lines in the Central Alarm Station was resolved.

On November 15, 2018, at 4:21 p.m., OCIO reported that a voice issue at NRC headquarters prevented some users from being able to make phone calls to parties outside of the agency. In the absence of this capability, alternatives available included using email or smartphones. On November 16, 2018, at 11:13 a.m., OCIO reported that the issue was resolved.

On January 11, 2019, at 9:40 a.m., NRC experienced a voice issue that prevented some NRC headquarters staff from receiving calls from outside the NRC. On January 13, 2019, at 11:13 a.m., the same issue reoccurred.

On January 28, 2019, at 2:35 p.m., Region I experienced an outage that impacted connectivity to the internet and NRC enterprise services such as email, Skype for Business, telephones and other headquarters hosted applications and services. On January 29, 2019, at 6:11 a.m., OCIO announced the outage was resolved.

On January 30, 2019, at 4:53 p.m., OCIO announced that access to Emergency Dialing (911) was affected by voice issues at the NRC headquarters, regional offices, and Technical Training Center. The outage impacted all staff at headquarters, regions, and Technical Training Center because they could not access 911 from their desk phones. Direct access to 911 was available from NRC headquarters health center and guard stations. In the event of an emergency, staff were asked to use a cell phone to call 911 or go to the closest Guard station or the NRC headquarters Health Center to call 911. On February 1, 2019, at 7:23 a.m., OCIO reported that many of the phone problems at NRC headquarters, regional offices and TTC were resolved.

Challenging Deployment of New Equipment

Deployment of the new VoIP phones presented significant challenges for NRC. Specifically, NRC staff and 3Links contractors had to remove and install 2,400 telephone stations in a compressed timeframe (4 days), which required staff and contractors to work around the clock to maintain the milestone schedule. This was further complicated by the fact that NRC failed to follow and maintain an accurate inventory of equipment and phone numbers prior to and during VoIP deployment. This complicated the process for removing and installing new equipment.

Reasonable Accommodations Needs Not Met in Timely Manner

Lastly, NRC did not appropriately plan to acquire the equipment necessary to accommodate those individuals with a documented reasonable accommodation. OCIO did not coordinate with the Office of the Chief Human Capital Officer to ensure all necessary equipment (headsets and headset lifts) to replace legacy equipment with Avaya compatible headsets, was ordered and given to those persons with a documented reasonable accommodation in time for deployment. As of May 29, 2019, OCIO was in the process of securing the necessary equipment – even though the deployment was in September 2018.

Why This Occurred

Insufficient Planning for the VoIP Project

There was a lack of sufficient and appropriate planning for the VoIP project and deployment. The Turning Point Audit, conducted in July 2017, identified several weaknesses including

- Staffing,
- Resources,
- Data management,
- Program management,
- Tracking of services and assets from legacy to new contracts,
- Budget and financial modeling; and,
- An automated process for service orders and inventory of assets.

Turning Point made 10 recommendations to address these weaknesses. However, these recommendations were not implemented prior to the VoIP pilot or deployment.

Selection of Pilot Participants was Flawed

NRC's selection of VoIP pilot participants was not representative of the agency's general population. Pilot participants were selected from a list of volunteers that participated in prior technology pilots and the majority were OCIO staff. Generally, these participants were skillful users of new technology who do not require much assistance to figure out the functionalities of a device or program and are able to resolve issues on their own. For the most part, these pilot participants only received an instructional pamphlet or a link to a short video.

Furthermore, the pilot did not include any resident inspectors or resident inspector sites. However during deployment, resident inspector sites experienced issues communicating with licensees, regional offices, and NRC headquarters. The telecommunication needs of the resident inspector sites are much different than those of headquarters and regional offices. The resident inspector sites have unique needs in that they must maintain direct communication with the licensee, the plants, the regional office, the local government, and NRC headquarters. Many of these resident inspector sites are in remote locations where internet connectivity is already a problem, and this was compounded by the addition of VoIP.

Lack of System Testing Led to Network Outages

Inadequate VoIP software implementation and lack of network capacity testing led to network outages. The outages arose from a change in the Avaya system to install Prognosis, the Verizon/Avaya telephony network monitoring tool. This change was never tested in a testing environment; as a result, it did not work and caused a serious system failure. Additionally, Verizon did not conduct any pre-installation and functionality testing for interoperability of communication systems between the resident inspector sites and licensees. The resident inspector sites' bandwidth for the network services was insufficient to support VoIP.

NRC Lacks Sufficient Telecommunications Expertise

NRC lacks sufficient telecommunications subject matter experts. The VoIP project was staffed by one telecommunications expert, who was supported by staff not permanently assigned to OCIO. The agency's reliance on this single subject matter expert was inadequate to facilitate a smooth and successful transition. Additionally, this was exacerbated by the lack of experts in agency legacy telecommunications systems.

MD 2.3, Telecommunications is Outdated

MD 2.3 and the associated handbook were last revised in October 2011 and expired in October 2016. Aside from being approximately 34 months past the expiration date, the MD and handbook are also outdated regarding the office, divisions, and branch roles and responsibilities, as they relate to the former Office of Information Services.⁷ The agency is in the process of revising multiple MDs, including MD 2.3. These MDs will be combined into a single guidance document, which will address the current agency telecommunication infrastructure.

Why This Is Important

Important Agency Communications Affected

Email, Internet, Phone, and Skype Functionality Affected

The NRC needs to maintain continuous availability of its network and telecommunications infrastructure for daily business activities, information technology security, and incident responders. Outages in fall 2018 and winter 2019 significantly affected staff's ability to conduct business. For example, internet access affects staff's ability to communicate either by phone, mail, or Skype for Business. Additionally, the NRC emergency and non-emergency lines in the Central Alarm Station were impacted.

⁷ An agency reorganization resulted in the creation of OCIO, which replaced the now defunct Office of Information Services and its associated divisions/branches.

Resident Inspector Sites

The VoIP transition significantly impacted many resident inspector sites. Resident inspectors are considered the “eyes and ears” of NRC and their work is at the core of the agency's reactor inspection program. In addition to the 1,725 CSC tickets reported by headquarters staff, resident inspectors also reported numerous problems resulting from the VoIP transition. Many resident inspector sites experienced problems with bandwidth strength which caused lack of connectivity, impaired audio and visual quality, and reduced phone functionalities such as voice mail, and call forwarding.

Concern for Future Transitions

The WITS 3 contract will be replaced by the Enterprise Infrastructure Solutions contract. NRC anticipates this will happen in calendar year 2020. For this and future IT transitions, NRC should have ready access to the information it needs to make data-driven decisions. Specifically, the agency must have an inventory of its in-office and network assets, current usage, and future needs. To address these concerns, OCIO has implemented NiOS, a time and expense management system. NiOS updates inventory in real-time through automated validation of invoices, order completion notices, orders, and contracts. Additionally, NRC is in the process of implementing recommendations made by Turning Point in the audit report and business solutions report.

However, subject matter expertise continues to be inadequate to ensure a successful transition to the Enterprise Infrastructure Solutions contract.

Recommendations

OIG recommends that the Executive Director for Operations

3. Conduct a lessons learned to identify opportunities for improvement in deploying future IT systems or services with an impact on operations agency-wide.
4. Strengthen telecommunications expertise through knowledge management and training.

5. Update the relevant management directives to include a) current telecommunications infrastructure and current organizational responsibilities, and b) a requirement to comply with MD 10.162 "Disability Programs and Reasonable Accommodation" when deploying any IT projects.

IV. OTHER ISSUE

A. Phone Log in Issue

NIST Guidance on VoIP

NIST SP 800-58 recommends organizations examine and acceptably manage and mitigate the risks to their information, system operations, and continuity of essential operations when deploying VoIP systems.

Test Conducted

In May 2019, OIG performed a test on an unassigned VoIP Avaya phone. Two OIG auditors entered the user name and password for another NRC employee and were able to “log in” as this employee. The test demonstrated that anyone in the agency could divert an assigned phone line to another unassigned phone anywhere within the NRC phone systems, by using information available through the NRC’s Outlook Directory.

Why This Is Important

This test is important and presents potential security risks, as OIG was able to “mirror” another person’s phone account. This “mirroring” allowed OIG to divert this person’s incoming phone calls, make phone calls appearing as the individual, and answer calls made to the person’s extension.

OCIO Is Aware

OCIO is aware of this issue and has advised they are looking into potential solutions to ensure other agency staff and/or contractors cannot mirror another individual’s phone.

Recommendation

OIG recommends that the Executive Director for Operations

6. Identify and implement a solution to address the issue pertaining to diverting an assigned phone line.

IV. CONSOLIDATED LIST OF RECOMMENDATIONS

OIG recommends that the Executive Director for Operations

1. In all current telecommunications contracts, a) clarify contractor roles and responsibilities, and b) consult legal counsel to review the telecommunications contracts collectively to eliminate gaps and duplication in services.
2. Establish a policy for all new telecommunications contracts, and future modifications to current telecommunications contracts, that CORs must review the roles and responsibilities of all related contracts to prevent gaps and duplication in services.
3. Conduct a lessons learned to identify opportunities for improvement in deploying future IT systems or services with an impact on operations agency-wide.
4. Strengthen telecommunications expertise through knowledge management and training.
5. Update the relevant management directives to include a) current telecommunications infrastructure and current organizational responsibilities, and b) a requirement to comply with MD 10.162 "Disability Programs and Reasonable Accommodation" when deploying any IT projects.
6. Identify and implement a solution to address the issue pertaining to diverting an assigned phone line.

V. AGENCY COMMENTS

An exit conference was held with the agency on August 28, 2019. Prior to this meeting, agency management reviewed a discussion draft. Agency management stated their general agreement with the findings and recommendations in this report and opted not to provide formal comments for inclusion in this report.

OBJECTIVE, SCOPE, AND METHODOLOGY

Objective

The objective was to evaluate the NRC Voice over Internet Protocol (VoIP) deployment, the relevant contracts, and the functionality of the new equipment, in order to identify any opportunities for improvement and solutions moving forward.

Scope

This evaluation focused on the services provided by the telecommunications contract vendors and implementation of the VoIP transition. We conducted this evaluation from January 2019 to June 2019 at NRC headquarters in Rockville, Maryland. OIG reviewed documents, conducted interviews, observed a software demonstration, and analyzed Customer Service Center ticket data. Internal controls related to the evaluation objective were reviewed and analyzed.

Methodology

To accomplish the evaluation objective, OIG reviewed relevant Federal law, regulations, policies, guidance, and other documentation, including

- *Rehabilitation Act of 1973*, as amended
- Federal Acquisition Regulation, Volume 1, Parts 1 to 51
- NRC Acquisition Regulation (48 CFR Chapter 20)
- NRC Management Directive 2.3, "Telecommunications"
- Management Directive 11.1, "NRC Acquisition of Supplies and Services"
- NRC IT Asset Management Policy, Version 1.0
- "Nuclear Regulatory Commission (NRC) Audit Report" prepared by Turning Point
- "Nuclear Regulatory Commission (NRC) Business Process Improvement Report" prepared by Turning Point

OIG reviewed and analyzed over 1,725 tickets submitted to the customer service center by NRC staff to assist them with VoIP related issues. Additionally, we reviewed the "VoIP_Resource Mailbox," where staff asked non-technical questions related to VoIP. We also observed a demonstration of the NiOS software system which is a core telecommunications expense and business management solution.

OIG interviewed NRC staff from the OCIO, the Office of Administration, Region I, Region II, Region III and Region IV – including a sample of resident inspectors from each regional office. OIG also interviewed contractors from Verizon and 3Links, as well as a former NRC employee who helped plan the VoIP project. These interviews helped auditors gather information about various aspects of the VoIP transition such as the pilot phase and deployment.

We conducted this evaluation in accordance with the Council of Inspectors General on Integrity and Efficiency's *Quality Standards for Inspection and Evaluation*.

Throughout the evaluation, auditors considered the possibility of fraud, waste, and abuse in the program.

The evaluation was conducted by Jaclyn Storch, Team Leader; Kristen Lipuma, Audit Manager; Deyanara Gonzalez-Lainez, Senior Auditor; Janelle Wiggs, Senior Auditor; Mathew Soares, Auditor; and Bobbie Castillo, Student Intern.

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COMMENTS AND SUGGESTIONS

If you wish to provide comments on this report, please email OIG using this [link](#).

In addition, if you have suggestions for future OIG audits, please provide them using this [link](#).