DEPARTMENT OF VETERANS AFFAIRS

The President's Spectrum Policy Initiative
2007 Update of the Veterans Affairs
Strategic Spectrum Plan

January 2008

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Executive Summary

The President's Spectrum Policy Initiative (SPI) called for Federal agencies to:

- assess their available options for deploying RF-enabled technologies;
- select those options that are most spectrum efficient and effective to meet agency mission requirements;
- implement a formal process to evaluate proposed needs for spectrum and to provide their analysis and assessment(s) to the National Telecommunications and Information Administration (NTIA) for review when seeking spectrum certification from the NTIA; and,
- identify their issues related to communication spectrum used by the public safety community as well as the continuity of government operations.

This update to the Department of Veterans Affairs Strategic Spectrum Plan affords us the opportunity to update the information in the VA's Strategic Spectrum Plan submitted in November, 2005, to describe where we are today, and where we want to be in the future. In this update to its Strategic Spectrum Plan, the VA is focusing on:

- current use of federal spectrum; the systems, programs, and missions
- future use of federal spectrum; the systems, programs, and missions
- current use of commercial licensed spectrum; the challenges and missions
- future use of commercial licensed spectrum; the challenges and missions
- current use of unlicensed spectrum
- new technology use; and
- review of VA's spectrum management functions.

VA will continue to review its plans and processes to make the most efficient use of the spectrum.

1 Introduction

The President's Spectrum Policy Initiative has four main goals:

1) foster economic growth;
2) ensure national and homeland security;
3) maintain US global leadership in communications technology development and services;
4) satisfy vital U.S. needs in areas such as public safety, scientific research, Federal transportation infrastructure, and law enforcement.

With these goals in mind, VA's missions and strategic visions for current and future spectrum management is described in this report.

2 Current Spectrum Use

2.1 System Functionality

The primary mission of VA remains substantially unchanged as does its primary use of the spectrum. Veterans Health Administration (VHA), Veterans Benefit Administration (VBA), and National Cemetery Administration (NCA) are the three administrations which are dependent on spectrum. VA Staff Offices are also dependant on spectrum for the Inspector General (IG) and security.

2.2 Missions and Programs

VHA and NCA continue to have more than half of its spectrum use in the Land Mobile Radio (LMR) bands: 162 – 174 MHz and 406.8 – 420 MHz. VBA continues to limit spectrum use to commercial products.

2.3 Geographical Coverage

VA has more than 1300 facilities throughout the contiguous United States, Alaska, Hawaii, Philippines, Guam, American Samoa, Puerto Rico, and the Virgin Islands. These locations include VHA Medical Centers (VAMC), Outpatient Clinics (OPC), Community Based Outpatient (CBOC), and Vet Centers. NCA cemeteries and VBA Benefit Offices are located in the same geographic areas.

2.4 System Technical Parameters

LMR use is distributed in the 162 – 174 and 406.8 – 420 MHz bands and uses the narrowband (12.5 KHz) channels. Medical telemetry protected use is in the 608-614, 1395-1400, and 1429-1432 MHz bands.

2.5 Current Use of New Technologies

VA has completed the mandatory conversion to the 12.5 KHz narrowband channels from the 25 KHz wideband channels. VA continues to transition medical telemetry equipment from the unprotected 450-470 MHz band to protected frequencies in 608-614 MHz band.

2.6 Sharing of Systems and Spectrum

When possible, VA uses a VA-owned trunked radio system for spectrum efficiency. VA shares other agencies system when feasible.

2.7 Systems Used in Border Areas or Outside US&P

VA continues to have ongoing LMR congestion issues in high volume border areas such as San Diego and the Great Lakes Region. These congested areas limit the ability to find frequencies that comply with NTIA's published channeling plan.

2.8 COOP/COG

VA uses existing facility LMR systems to support local Continuity of Operations (COOP) and is establishing an HF radio network to support COOP and Continuity of Government (COG) activities in addition to local natural disaster support.

2.9 Challenges to Implementing Spectrum-dependent Systems

As a leader in the transition to narrowband LMR systems, VA often had to resort to solutions outside the channel plan because many agencies were still operating on their wideband assignments. VA is looking to become compliant with the channel plans as equipment and systems are transitioned during the next generation.

3 Future Spectrum Use

3.1 System Functionality

VA expects to see a significant increase in the use of HF radio on current VA assigned frequencies, Shares Resources (SHARES), an increase in Federal emergency preparedness exercises, and other Federal HF Networks as a result of National Communications System (NCS), Directive 3-10. VA expects that during these exercises the need for additional HF frequency allocations to support VA regional HF networks will be discovered.

3.2 Missions and programs

HF systems will support COOP/COG and local/regional emergency preparedness.

3.3 User Community

VA's COOP, COG and Preparedness Emergency Management Strategic Healthcare Group communities and local emergency planners, medical care providers, clinicians and the Veterans in their care.

3.4 Geographical Coverage

The future areas of interest (AOR) will not change significantly from the current AOR. Of the 1300 facilities throughout VA's AOR which are in the contiguous United States, Alaska, Hawaii, Philippines, Guam, American Samoa, Puerto Rico, and the Virgin Islands, it is expected a few new facilities will be added.

3.5 System Technical Parameters

NTIA guidance and regulations will remain the determining factor in the technical parameters used by VA. System decisions are mostly based on the guidelines set forth in the NTIA Manual for federal regulations. Additional regulations are bound in the National Communications System Manual, NCSM 3-10, *Guidance for Implementaion of NCS Directive 3-10.* NCSM 3-10 once approved.

3.6 Agency Functionalities Supported by Spectrum-Dependent Systems

COOP/COG and Emergency Preparedness communications as supported by NCS 3-10 and local VA Emergency Preparedness planners. VA also participates in a variety of Federal interagency exercises to evaluate emergency communications readiness. In the medical facilities, staff and patient paging, telemetry, prescription fills, patient monitoring, and routine and emergency communications support medical care providers, clinicians and the Veterans in their care.

3.7 Sharing of Systems and Spectrum

A major expectation for future use will be driven by the approval of the National Communications System Manual, NCSM 3-10, *Guidance for Implementation of NCS Directive 3-10.* This manual provides Federal Executive Branch (FEB) continuity planners with guidance in implementing NCS Directive 3-10, *Minimum Requirements for Continuity Communications Capabilities*. The manual provides information on the communications capabilities requirements, as well as procurement guidance and operational security considerations. These communication systems must support connectivity among key government leadership, internal elements, other agencies, critical customers, and the public under all conditions. VA is also an active participant in SHARES and other shared frequency networks.

3.8 Planned Use of New Technologies

Plans to focus on interoperability by both, NTIA and the agencies, would enhance spectrum efficiency. In the LMR area, we will transition to new Public Safety bands in concert with our local civil and state emergency and first responders. We expect to see a wide variety of low-power monitoring and communications devices come into play in the medical community

3.9 Use of Commercial Systems

Commercial systems are increasingly becoming considered as an alternative to federally allocated systems. Technology is a strong driver in commercial systems and is also more cost effective. Commercial systems are also less congested than federal systems. VBA has been a user of commercial spectrum and the pattern is continuing throughout VA mainly because of cost, convenience, and accessibility of the systems.

3.10 Systems Used in Border Areas or Outside US&P

Federal spectrum-supported systems along the border have provided challenges in the past and are anticipated to do so in the future. The congested border areas, such as Southern California and the Great Lakes region along with most of the east coast, will remain congested as long as some federal agencies “over-protect” their LMR assets. If agencies would release frequency

assignments that are not actually in use, it would be easier to find assignments that would meet the channeling plan.

The international agreements dividing spectrum in the border areas along Mexico and Canada are necessary, but present challenges when coordinating assignments and attempting to abide by the channeling plan. It would be helpful if spectrum planners on both sides of the border were using the same propagation models/software to determine potential for interference.

3.11 COOP/COG

The planned HF systems will be used for COOP/COG support and emergency preparedness.

3.12 Challenges to Implementing Spectrum-Dependent Systems

VA does not currently anticipate any difficulties except those noted in 3.10 above.

3.13 New Spectrum Requirements

VA does not anticipate developing any new requirements.

3.14 Future Plans for Systems

VA does not anticipate any significant changes to the current plans for Federal or shared spectrum allocations in the next five years.

3.15 Impact to Meeting Agency Missions

In the event spectrum would not be available for VA to meet its mission requirements the impact could prove life threatening. With the exception of the congested areas already mentioned, it is not foreseen there will be any concern for spectrum availability in the near future.

4 Current Use of Commercial Licensed Systems

4.1 Challenges to Using Commercial Systems

A significant challenge to using commercial systems is the ability to educate the VA user community and the commercial sales persons. Though improved, VA must continue to establish channels to educate users regarding federal rules and regulations concerning the use of commercial systems, and corresponding VA regulations.

This challenge to educate is crucial to the VA mission. Failure to educate could result in systems that have the potential to degrade safety of life or risk a of breech privacy information. Systems used by VA must satisfy requirements determined by specific use. Commercial systems must meet the Underwriters Laboratory (UL) Standards for Safety, Federal Information Processing Standards (FIPS) a set of standards developed by the National Institute of Standards and Technology (NIST), Office of Cyber and Information (OCIS), and the Health Insurance Portability and Accountability Act (HIPAA) appropriate for that use; educating the sales and purchaser is crucial.

Commercial systems offer the users many options that are more affordable.

4.2 Trends In Use

VA anticipates continued slow growth in the use of commercial Very Small Aperture Terminal (VSAT) systems to support emergency preparedness and mobile medical clinics providing field medical care. VA will also continue limited expansion of its use of Iridium Satellite handsets to support COOP/COG and emergency preparedness.

4.3 Systems Used

Most VA facilities have adopted commercial systems as a primary option to support their missions. Telephone networks, staff and patient paging, telemetry, prescription fills, patient monitoring, and routine and emergency communications are all missions supported by commercial systems. Figure 1 below lists some known systems currently in use by VA.

System	*RF Range*	*Use*
Ascom	1920-1930 MHz	Staff notification: Wireless cell; stand alone or connected to Nurse call/Code Blue systems
Rauland-Borg	Wireless phone ranges	Staff notification: wireless telephones for staff and patient notification
Spectra Link	2.4-2.4835 GHz	Staff notification: Wireless telephones for staff to communicate between clinics/stations within the facility
Vocera	2.4-2.4834 GHz	Staff notification: Wireless cell; stand alone or connected to Nurse call/Code Blue systems
JTech	450-470 MHz	Patient notification: Digital pocket paging used primarily for patient paging

Figure 1: ***Known systems used by VA***

4.4 COOP/COG

VA currently depends on commercial systems for emergency communications. HF systems remain at select VA facilities. There is not a standard throughout VA; VA Central Office (DC Headquarters) has an HF radio with Automatic Link Establishment (ALE) capability. Iridium Satellite phones are prevalent throughout VA facilities.

5 Future Use of Commercial Licensed Systems

5.1 Challenges and Obstacles

A significant challenge to using commercial systems remains the ability to educate the VA user community and the commercial sales persons. VA must continue to establish channels to educate VA user regarding the federal rules and regulations, the commercial systems, and VA regulations.

This challenge to educate is crucial to the VA mission. Failure to educate could result in systems that have the potential to degrade safety of life or risk a breech of privacy information. Systems used by VA must satisfy requirements determined by specific use. Commercial systems must meet the Underwriters Laboratory (UL) Standards for Safety, Federal Information Processing Standards (FIPS) a set of standards developed by the National Institute of Standards and Technology (NIST), Office of Cyber and Information (OCIS), and the Health

Insurance Portability and Accountability Act (HIPAA) appropriate for that use; educating the sales and purchaser is crucial.

5.2 Trends in Use

Currently, Iridium Satellite services and growing number of mobile VSAT terminals operated on commercial spectrum constitute a majority of VA's emergency communications capabilities. It is anticipated that satellite use for emergency communications will continue to expand in the future.

5.3 Systems Used

VA will use Iridium and a variety of VSAT vendors. VSAT contracts are negotiated by the Regional VA facilities that use them.

5.4 Frequency Bands and Bandwidth

Existing and future commercial VSAT assignments

5.5 Agency Functions Supported by Commercial Systems

VHA Mobile Command Clinical Services and Emergency Preparedness

5.6 COOP/COG

Iridium and commercial VSAT

6 Current and Anticipated Unlicensed Systems

6.1 Challenges and Concerns

We have significant concern over the potential use of unlicensed spectrum and unprotected frequencies for Nurse Call, Code Blue, and similar services. Even if these systems are officially considered secondary alert systems, the convenience and ease of use may quickly turn them into the de facto primary.

6.2 Five-year Trends

VA has recently committed to significant growth in the use of unlicensed, unprotected spectrum for 802.11 systems throughout its hospitals. This issue has raised concerns and challenges for those responsible for security of patient data and safety of life issues. Other unlicensed applications including wireless clocks and patient pagers are also increasing in numbers and diversity contributing to a complex RF environment. As the RF noise threshold rises unprotected devices may find themselves competing for connectivity in a very congested environment. VA would like to work with manufacturers to move unprotected emissions to an assigned frequency in a protected part of the spectrum.

6.3 Unlicensed Systems and Devices

Patient pagers, Nurse Call, VoIP applications. See Figure 1, Para. 4.3

6.4 Frequency Bands of Unlicensed Systems and Devices

See Figure 1, Para. 4.

6.5 Lessons Learned

Officially interference issues with unlicensed devices have not been reported to us. It is interesting to note that VA bio-med technicians have developed training to deal with interference on mobile nurse/medical equipment carts. As growth continues to raise the RF noise threshold additional problems may appear for low power, unlicensed devices

7 Evaluation of New Technologies

7.1 Potential New Technologies

The addressing capability of Internet Protocol Version 6 (IPv6) and the rapid growth of Voice over Internet Protocol (VoIP) systems lead us to believe that many of the "stand-alone" RF systems of the past will soon be digitalized, addressed, and integrated into the wider digital infrastructure enhancing end-to-end communications capabilities. VA will continue to be a consumer of advanced medical technology developed using commercial licensed or unlicensed spectrum. VA is currently preparing for widespread use of 802.11 wireless services supporting a wide variety of applications. VA also anticipates a significant increase in the use of RFID technology in tracking medical equipment, pharmaceuticals, and a variety of other applications. Working groups have been created to study and evaluate and advise on wireless, RFID and Nurse Call systems to be used within the Department.

7.2 Using Technology To Meet Communications Requirements

VA expects the impact of using new technology to meet communications requirements to be very advantageous. New technology provides more functionality and interoperability among and between federal and civil agencies. This equates to more RF sharing and re-use and a decrease in spectrum requirements. While VA is anticipating significant additional use of wireless technology, most of the increase is low power unlicensed or commercially licensed products within existing spectrum allocations.

7.3 Challenges To Implementing New Technology

The largest challenge to implementing new technologies is the agency budget. Budgets are submitted years prior, so by the time the funds are programmed and available at the national level the technology is already changed. Locally controlled funding is available to medical facilities and clinics eager to enhance their productivity and improve service to the Veteran. Unfortunately it can result in the purchase of unlicensed, unprotected RF devices prior to centralized review.

8 Organization and Integration

8.1 VA Spectrum Management Organization

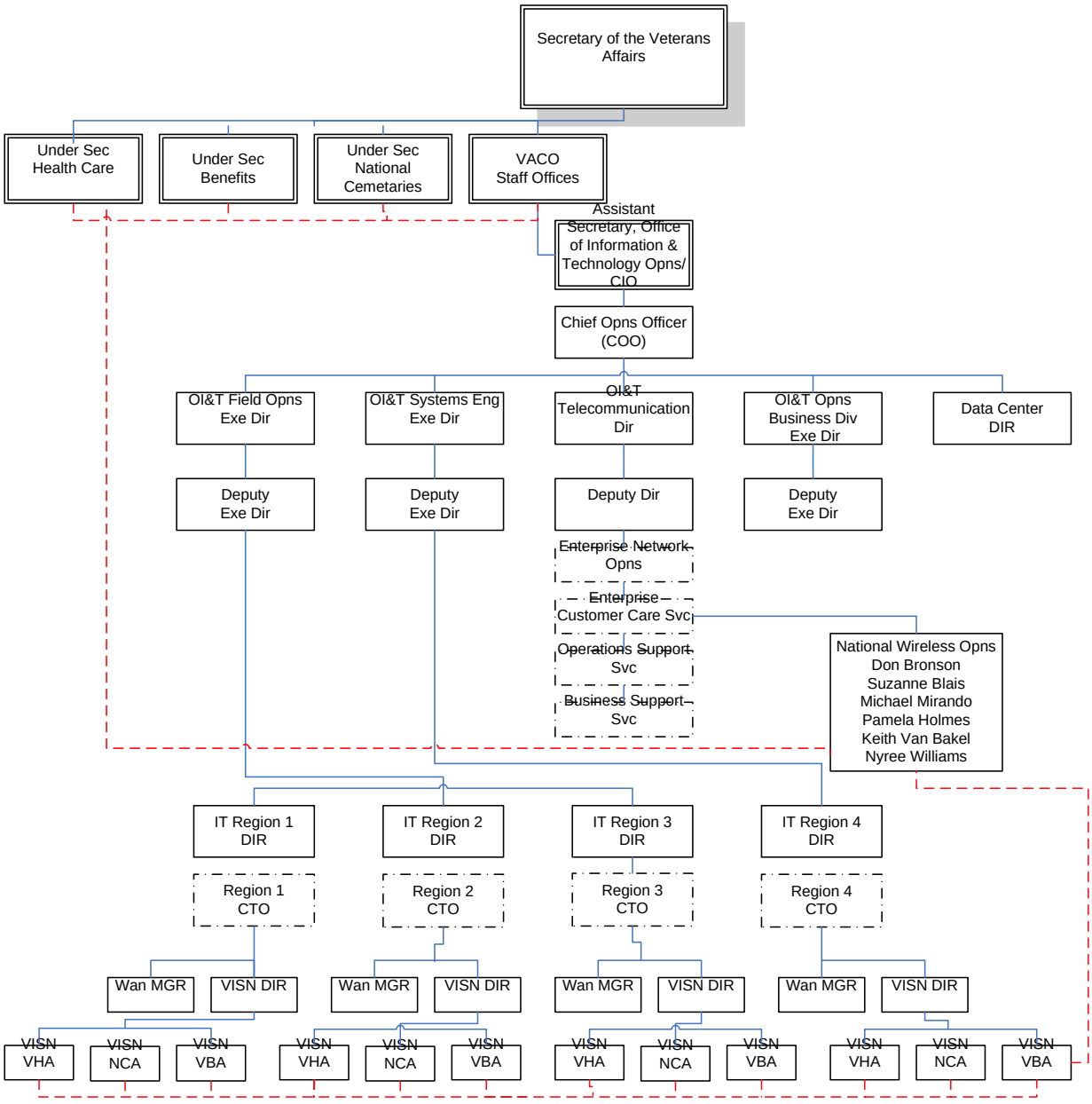

Figure 2: ***Organization Chart, Spectrum Management Structure***

8.2 Work Flow Process

Reporting begins with a user request. The request is worked within its respective Administration's process. The RF authorization request is signed by the Administration's facility director and sent, electronically or by postal mail, directly to the National Wireless Operations (NWO) section under the Office of Information and Telecommunications (OI&T) Telecommunications Director. In the majority of cases, the user/client does not possess a spectrum management background. Therefore, a definitive requirements analysis takes place between the user/client and the NWO before and after a request is processed with only the

NWO accessing the automation within Spectrum XXI. VA has not yet automated the RF Authorization request but is evaluating a web based data collection process.

Figure 3 depicts the spectrum management work flow process. This process is not automated and relies heavily on the background and knowledge of individuals assigned to the review process.

In the event a system review is necessary, the process is worked similar to the RF request process through the NWO office. Requests for commercial spectrum, once approved by the IT Tracker process, are worked at the requesting facility's contract office.

8.3 VA Spectrum Management Process

The VA's spectrum management process is depicted in the following chart.

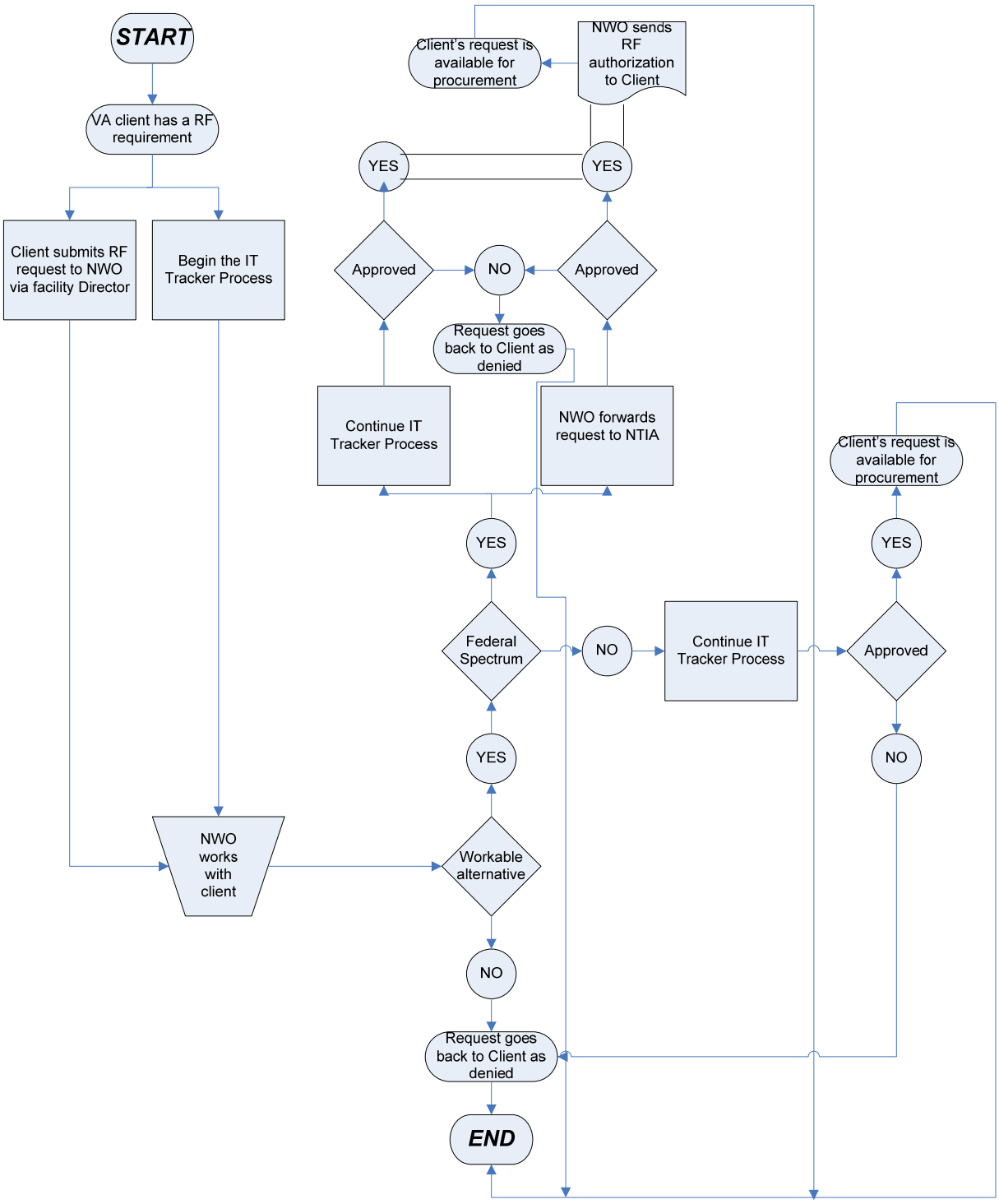

Figure 3: ***Spectrum Management Process***

8.4 Agency Strategic Spectrum Management Activity

VA continues to make improvements to the IT Tracker management processes such as the Spend Plan Management Systems and the Executive 300. The Executive 300 process continues to be updated and enhanced to ensure technology investments are appropriately aligned to VA's Enterprise Architecture and strategic information plan. The executive 300 process is a high-level-long-term process therefore is not included in the spectrum flow process.

8.5 Spectrum Management Integration: Past 3-5 Years

The development of the VA Strategic Spectrum Plan has created an enhanced awareness of spectrum related issue within the VA IT Community. Our Frequency Management staff are now involved in numerous technology planning groups and the IT Tracker approval process for acquisitions.

8.6 Spectrum Management Integration

Within the VA, continued efforts are being made to integrate spectrum management with agency strategic and capital planning.

8.7 Spectrum Management Office Points of Contact

VA Spectrum Management Office *Department of Veterans Affairs* *OI&T, Office of Telecommunications* *810 Vermont Avenue N.W.* *Washington D.C. 20420*			
David Cheplick	202.461.5905	**David.cheplick@va.gov**	Director, OI&T
Donald Bronson	202.461.5301	**Don.bronson@va.gov**	NWO team leader
Suzanne Blais	202.461.5305	**Suzanne.blais@va.gov**	Telecom specialist

Figure 4: ***Spectrum Management Office Contact Information***

9. Recommended Actions for NTIA

In the past, concerns were that NTIA was not focused on other agency input. Today NTIA's actions continue to improve. The creation of working forums helps to keep its focus while addressing the interests of the Federal agencies such as in Working Level Group G. NTIA is becoming more receptive of agency concerns and incorporating agency suggestions.

10. Conclusion

The VA is pleased to provide this update to its agency strategic spectrum plan in accordance with the mandate of the President's Memorandum dated November 30, 2008.