



SPECTRUM MANAGEMENT,
ENGINEERING SERVICES AND
PROGRAMMATIC RESOURCE
MANAGEMENT SUPPORT

Statement of Work



MARCH 17, 2015

STATEMENT OF WORK
Spectrum Management, Engineering Services and
Programmatic Resource Management Support

I. BACKGROUND

This procurement is to support the Space Communication and Navigation Program implement its responsibilities. These responsibilities can be divided in two areas: Spectrum Management and Program Management. Within the Spectrum Management area, the SCaN Program is the designated authority for the Agency to support the Agency and the U.S. commercial space communication industry for spectrum allocations and assignments through leadership and coordination with national and international spectrum management organizations. Within the Program Management area, the SCaN Program is the designated authority for maintaining operational readiness of space communication and navigation capability to NASA missions and enhancing such capability through maturation of technology, development of new systems and leading the development of international standards in space communication and navigation.

This support requires professional expertise in the disciplines of regulatory, engineering, management accounting and public outreach. The professional expertise is implemented in the following services and activities:

Core services and activities:

- A. (SOW III.A) Domestic and International Spectrum Management and Regulatory Services
- B. (SOW III.B) Programmatic and Management Accounting Tools and Services
- C. (SOW III.C) Web presence and applications, Education and Public Outreach Activities

IDIQ services and activities:

- D. (SOW III.D) Space Communications and Navigation Engineering Services

II. REQUISITE KNOWLEDGE AND CAPABILITIES

- A. Domestic and International Spectrum Management and Regulatory Services
 - a. The expert knowledge, which maybe required by the Contractor, include but is not limited to the following:
 - i. General spectrum management, regulations and policies
 - ii. Compatibility analyses
 - iii. Communication and Sensor technologies
 - iv. Radio-navigation and global positioning system technologies
 - v. Space and ground networks
 - vi. Spectrum aspects of extra-terrestrial mission and life assessments
 - vii. Orbital debris management.
 - b. The specific capabilities, which maybe required by the Contractor, include but are not limited to the following:
 - i. Spectrum management experience and knowledge of Agency spectrum usage sufficient to act autonomously when representing the Agency at various spectrum management fora.

- ii. Presentation and representation skills sufficient to advocate for the Agency in various spectrum management fora.
 - iii. Ability to understand all aspects of spectrum management issues, to rapidly deduce the possible impact on Agency programs and missions, and to act on behalf of the Agency or recommend to the Agency the appropriate course of action on such issues.
- B. Programmatic and Management Accounting Tools and Services
- a. The expert knowledge, which maybe required by the Contractor, include but is not limited to the following:
 - i. Governments' Planning, Programming, Budgeting and Execution Process (PPBE process)
 - ii. Accounting principals within the USG
 - iii. Program management principals including familiarity with NASA's 7120.5.
 - b. The specific capabilities, which maybe required by the Contractor, include but are not limited to the following:
 - i. Management accounting (financial reporting and analyses, funding distributions, etc.).
 - ii. Financial analyses and cost management
 - iii. Cost projections of ground systems
 - iv. Implementation of the PPBE process
 - v. Operations analyses
- C. Web presence and applications, Education and Public Outreach Activities
- a. The expert knowledge, which maybe required by the Contractor, include but is not limited to the following:
 - i. Development of Web-sites and applications including social media
 - ii. Development and maintenance of intranets
 - b. The specific capabilities, which maybe required by the Contractor, include but are not limited to the following:
 - i. Maintaining multiple web-sites with up-to-date content
 - ii. Development of fast web-applications
 - iii. Communicating to a wide range of audience from school children to international groups and forums
- D. Space Communications and Navigation Engineering Services (IDIQ)
- a. The expert knowledge, which maybe required by the Contractor, includes but is not limited to the following:
 - i. Optical communication technologies
 - ii. Quantum mechanics
 - iii. Space Navigation
 - b. The specific capabilities, which maybe required by the Contractor, include but are not limited to the following:
 - i. Development of Space communication and navigation Standards
 - ii. Systems Engineering; specifically related to space communication and navigation
 - iii. Ground systems development and network operations

III. Statement of Work

CORE SERVICES - (CLIN 1)

A. Domestic and International Spectrum Management and Regulatory Services:

The Contractor shall:

1. Perform Engineering studies and provide technical support related to the electromagnetic spectrum and telecommunications systems as required for near Earth and deep space research
2. Analyze U.S. domestic and international spectrum regulatory and policy issues, especially spectrum inventory initiatives started as a result of the National Broadband Plan and its effects on NASA
3. Perform Engineering studies in support of Agency requirements for spectrum allocations, assignments and coordination in national spectrum management organizations related to Agency's mission needs as well as the Agency's support of the U.S. commercial space communications industry. This activity requires the collaboration and participation of the Contractor with other organizations. See Appendix A for a list of organizations.
4. Provide technical support in meeting the requirements of the ITU Radio Regulations, the U.S. Office of Management and Budget (OMB), NTIA and Part 47 Code of Federal Regulations for space network registrations.
5. Support the Agency's technical preparations and participate in the 2015 world radiocommunication conference (WRC) and ancillary meetings for any future WRC as required, and provide technical support and consultation to Agency delegates at the conferences and meetings and provide technical services related to the implementation of these or other conference and meeting directives.
6. Participate in Conference Preparatory Meeting (CPM), and attend national and international meetings, to explain and defend Agency technical positions, and to counter proposals from other points of view.
7. Support the preparation and advocacy of technical contributions to appropriate ITU-R Study Groups, which will support Agency programs
8. Establish a technical basis for spectrum usage of the various space science services
9. Establish the technical justification supporting Agency proposals to a particular WRC. This work will take place in, but not be limited to the following international groups, and their U.S. counterparts and associated task and rapporteur groups that may form, which prepare U.S. inputs to the international meetings
 - a. Groups with required Agency involvement on a regular basis:
 - i. ITU-R Study Group 7: Science Services
 - b. Groups with Agency involvement on an as-needed basis:
 - i. ITU-R Study Group 1: Spectrum Management
 - ii. ITU-R Study Group 3: Radiowave propagation
 - iii. ITU-R Study Group 4: Satellite Services
 - iv. ITU-R Study Group 5: Terrestrial Services
 - v. ITU-R Special Committee: Regulatory Issues
 - c. Informal Coordination Groups with Agency involvement on an as-needed basis:
 - i. Space Frequency Coordination Group (SFCG)
 - ii. ESA/NASA/JAXA Frequency Coordination Meeting

10. Maintain Scientific and Industrial Organization (SIO) Membership in the ITU-R for purposes of providing an additional forum for presenting Agency requirements in the international community.

Deliverables:

1. Provide official reports, monthly and annually, describing the activities and outcome of official meetings Contractor represented the Agency in.
2. Submit results of Engineering studies
3. Submit results of all analyses related to regulatory and policy issues.

B. Programmatic and Management Accounting Tools and Services

The Contractor shall:

1. Support all business and financial management activities. This includes: Fiscal year analysis, budget formulation and execution, funding distributions, financial reporting and analysis, reimbursable support, contract analysis; study of contractor supplied 533, the reconciliation and integration of financial data;
2. Maintain the Integrated Master Schedule;
3. Maintain the SCaN's financial database;
4. Manage SCaN's risk management process
5. Provide Programmatic/Administrative support to the SCaN Program Office;
6. Develop and implement a SCaN database that will provide a single authoritative source (beyond the GMF) that will provide access to all information currently housed in the disparate NASA/SCaN databases and spreadsheets. Need status; if we still need this.
7. Design, develop and maintain the NASA Electronic Radio Database System (NERDS). NERDS is a living database system for spectrum management planning and operational activities. It currently occupies data exclusively for NASA operated systems. Revisions will include non-NASA systems, to include other Federal, international, and commercial. The database is the single, authoritative source of information for the NASA spectrum management community. The design and implementation of this database shall be an all encompassing strategic, tactical, one-stop tool for current and future NASA's mission assets and parameters, including specific spectrum bands, transmitters and receivers.

Deliverables:

1. Provide monthly financial status reports
2. Provide monthly schedule and risk reports
3. Update the NERDS database as needed

C. Web presence and applications, Education and Public Outreach Activities

The Contractor shall:

1. Manage various websites on behalf of the Program. This includes custom development of online applications, websites, and modules to support SCaN activities;
2. Manage Program-direct websites to meet a wide range of audiences, including the general public, internal groups, interagency groups, and international groups;

3. Develop websites in compliance with all government and NASA regulations and ensure the stability and security of the network on which the websites, databases and files reside;
4. Provide website maintenance which includes the organization of electronic content and user support and training and support for various SCA_N web applications;
5. Provide Education and Public Outreach Services consisting of development of content for the SCA_N public website, development of presentations for external audiences, coordination of Policy and Strategic Communications activity with the centers, management of SCA_N booths and presence for related conferences and the development and ordering of SCA_N and Human Exploration and Operations Mission Directorate branded material.
6. Provide technical support to further SCA_N's goals of policy advocacy, strategic communications, education and public outreach by strengthening SCA_N's national and international partnerships. The Contractor shall provide necessary support to increase visibility of NASA Space Communications and Navigation and enhancing its understanding with stakeholders and customers.

Deliverables:

1. Maintain the SCA_N web-site (both internal and external).
2. Develop and maintain out-reach presentations

IDIQ SERVICES - (CLIN 2)

D. Space Communication and Navigation Engineering Services

Representative task orders are shown in Appendix C. The Contractor shall:

1. Provide expert technical and programmatic support for NASA's future space communications architecture and technology development.
2. Support the SCA_N program to pursue advancements in technology including but not limited to increases in data rates. This development enables increased Communication and Navigation (C&N) capabilities available to missions and reduces the risk of deployment. Technology advancements may impact the mission's space or ground segments and/or the SCA_N integrated network. Example areas of support include new modulation schemes, coding, arraying techniques, and software-defined radio.
3. Provide support in the deployment of new frequency bands such as Ka-band to increase the data rate capability.
4. Support the development and integration of optical communications used to provide a significant increase in data rate capability and complement the SCA_N network's RF capabilities.
5. Support all SCA_N efforts and work related to the applicable international standards bodies to ensure that the needs of the NASA community are met in the formulation of these Standards as well as enabling SCA_N to interoperate with international and national partners.
6. Support other technical investigations, regulatory and administrative initiatives not specifically referenced elsewhere in this SOW.

Deliverables:

1. Provide monthly reports of the activities performed.

IV. Facilities

Contractor personnel who provide direct programmatic support to NASA Headquarters staff will be provided with offices at NASA headquarters. NASA currently provides 8 offices at NASA Headquarters. The remainder of Contractor staff will be housed at Contractor provided facilities. Due to the shortage of adequate office space at NASA headquarters, however, it may be necessary in the future for the Contractor to provide Contractor furnished office space near NASA headquarters (within walking distance) for Contractor personnel located at NASA headquarters.

V. Security Clearance Level

All Contractor personnel engaged in classified work, or required by their position to have a security clearance, shall have at a minimum a Secret Clearance. The Program Manager and Deputy Program Manager shall have a Top Secret/SCI Clearance. In certain instances, security clearances will be required at the Top Secret/SCI level which will be specified at the task order level. A Top Secret/SCI level facility clearance is required at the start of contract performance.

VI. Requirement to Provide Contract Historical Data

NASA may issue a competitive solicitation for a follow-on effort for services similar to those provided under this contract. As part of this follow-on competition, NASA may include historical labor category descriptions, full-time equivalents (FTEs), average direct labor rates, and other information from this contract in the follow-on solicitation for use by all potential offerors. Including this data in the solicitation is intended to ensure a comprehensive and fair evaluation of competitive proposals and increase the probability that realistic pricing is provided in future proposals submitted. Minimizing the potential risk for unrealistic or unsubstantiated pricing materially reduces the risk that cost/price could become an inappropriate discriminator among competing offerors.

Based on the above, the Contractor shall, within 30 days and in response to a written request from the Contracting Officer, provide and deliver all of the information included in Attachment 8, CONTRACT HISTORICAL DATA, of the contract.

VII. Section 508 Standards

Subpart A -- General

1) § 1194.1 Purpose.

The purpose of this part is to implement section 508 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794d). Section 508 requires that when Federal agencies develop, procure, maintain, or use electronic and information technology, Federal employees with disabilities have access to and use of information and data that is comparable to the access and use by Federal

employees who are not individuals with disabilities, unless an undue burden would be imposed on the agency. Section 508 also requires that individuals with disabilities, who are members of the public seeking information or services from a Federal agency, have access to and use of information and data that is comparable to that provided to the public who are not individuals with disabilities, unless an undue burden would be imposed on the agency.

2) § 1194.2 Application.

- a) Products covered by this part shall comply with all applicable provisions of this part. When developing, procuring, maintaining, or using electronic and information technology, each agency shall ensure that the products comply with the applicable provisions of this part, unless an undue burden would be imposed on the agency.
 - i) When compliance with the provisions of this part imposes an undue burden, agencies shall provide individuals with disabilities with the information and data involved by an alternative means of access that allows the individual to use the information and data.
 - ii) When procuring a product, if an agency determines that compliance with any provision of this part imposes an undue burden, the documentation by the agency supporting the procurement shall explain why, and to what extent, compliance with each such provision creates an undue burden.
- b) When procuring a product, each agency shall procure products which comply with the provisions in this part when such products are available in the commercial marketplace or when such products are developed in response to a Government solicitation. Agencies cannot claim a product as a whole is not commercially available because no product in the marketplace meets all the standards. If products are commercially available that meet some but not all of the standards, the agency must procure the product that best meets the standards.
- c) Except as provided by §1194.3(b), this part applies to electronic and information technology developed, procured, maintained, or used by agencies directly or used by a contractor under a contract with an agency which requires the use of such product, or requires the use, to a significant extent, of such product in the performance of a service or the furnishing of a product.

3) § 1194.3 General exceptions.

- a) This part does not apply to any electronic and information technology operated by agencies, the function, operation, or use of which involves intelligence activities, cryptologic activities related to national security, command and control of military forces, equipment that is an integral part of a weapon or weapons system, or systems which are critical to the direct fulfillment of military or intelligence missions. Systems which are critical to the direct fulfillment of military or intelligence missions do not include a

system that is to be used for routine administrative and business applications (including payroll, finance, logistics, and personnel management applications).

- b) This part does not apply to electronic and information technology that is acquired by a contractor incidental to a contract.
- c) Except as required to comply with the provisions in this part, this part does not require the installation of specific accessibility-related software or the attachment of an assistive technology device at a workstation of a Federal employee who is not an individual with a disability.
- d) When agencies provide access to the public to information or data through electronic and information technology, agencies are not required to make products owned by the agency available for access and use by individuals with disabilities at a location other than that where the electronic and information technology is provided to the public, or to purchase products for access and use by individuals with disabilities at a location other than that where the electronic and information technology is provided to the public.
- e) This part shall not be construed to require a fundamental alteration in the nature of a product or its components.
- f) Products located in spaces frequented only by service personnel for maintenance, repair, or occasional monitoring of equipment are not required to comply with this part.

4) § 1194.4 Definitions.

The following definitions apply to this part:

Agency. Any Federal department or agency, including the United States Postal Service.

Alternate formats. Alternate formats usable by people with disabilities may include, but are not limited to, Braille, ASCII text, large print, recorded audio, and electronic formats that comply with this part.

Alternate methods. Different means of providing information, including product documentation, to people with disabilities. Alternate methods may include, but are not limited to, voice, fax, relay service, TTY, Internet posting, captioning, text-to-speech synthesis, and audio description.

Assistive technology. Any item, piece of equipment, or system, whether acquired commercially, modified, or customized, that is commonly used to increase, maintain, or improve functional capabilities of individuals with disabilities.

Electronic and information technology. Includes information technology and any equipment or interconnected system or subsystem of equipment that is used in the creation, conversion, or duplication of data or information. The term electronic and information technology includes, but is not limited to, telecommunications products (such as telephones), information kiosks and

transaction machines, World Wide Web sites, multimedia, and office equipment such as copiers and fax machines. The term does not include any equipment that contains embedded information technology that is used as an integral part of the product, but the principal function of which is not the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information. For example, HVAC (heating, ventilation, and air conditioning) equipment such as thermostats or temperature control devices, and medical equipment where information technology is integral to its operation, is not information technology.

Information technology. Any equipment or interconnected system or subsystem of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information. The term information technology includes computers, ancillary equipment, software, firmware and similar procedures, services (including support services), and related resources.

Operable controls. A component of a product that requires physical contact for normal operation. Operable controls include, but are not limited to, mechanically operated controls, input and output trays, card slots, keyboards, or keypads.

Product. Electronic and information technology.

Self Contained, Closed Products. Products that generally have embedded software and are commonly designed in such a fashion that a user cannot easily attach or install assistive technology. These products include, but are not limited to, information kiosks and information transaction machines, copiers, printers, calculators, fax machines, and other similar types of products.

Telecommunications. The transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received.

TTY. An abbreviation for teletypewriter. Machinery or equipment that employs interactive text based communications through the transmission of coded signals across the telephone network. TTYs may include, for example, devices known as TDDs (telecommunication display devices or telecommunication devices for deaf persons) or computers with special modems. TTYs are also called text telephones.

Undue burden. Undue burden means significant difficulty or expense. In determining whether an action would result in an undue burden, an agency shall consider all agency resources available to the program or component for which the product is being developed, procured, maintained, or used.

5) § 1194.5 Equivalent facilitation.

Nothing in this part is intended to prevent the use of designs or technologies as alternatives to those prescribed in this part provided they result in substantially equivalent or greater access to and use of a product for people with disabilities.

Subpart B -- Technical Standards

1) § 1194.22 Web-based intranet and internet information and applications.

- a) A text equivalent for every non-text element shall be provided (e.g., via "alt", "longdesc", or in element content).
- b) Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.
- c) Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.
- d) Documents shall be organized so they are readable without requiring an associated style sheet.
- e) Redundant text links shall be provided for each active region of a server-side image map.
- f) Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.
- g) Row and column headers shall be identified for data tables.
- h) Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.
- i) Frames shall be titled with text that facilitates frame identification and navigation.
- j) Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.
- k) A text-only page, with equivalent information or functionality, shall be provided to make a web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.
- l) When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.

- m) When a web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with §1194.21(a) through (l).
- n) When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.
- o) A method shall be provided that permits users to skip repetitive navigation links.
- p) When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.

Note to §1194.22:

- 1) The Board interprets paragraphs (a) through (k) of this section as consistent with the following priority 1 Checkpoints of the Web Content Accessibility Guidelines 1.0 (WCAG 1.0) (May 5, 1999) published by the Web Accessibility Initiative of the World Wide Web Consortium:

Section 1194.22 Paragraph	WCAG 1.0 Checkpoint
(a)	1.1
(b)	1.4
(c)	2.1
(d)	6.1
(e)	1.2
(f)	9.1
(g)	5.1
(h)	5.2
(i)	12.1
(j)	7.1
(k)	11.4

- 2) Paragraphs (l), (m), (n), (o), and (p) of this section are different from WCAG 1.0. Web pages that conform to WCAG 1.0, level A (i.e., all priority 1 checkpoints) must also meet paragraphs (l), (m), (n), (o), and (p) of this section to comply with this section. WCAG 1.0 is available at <http://www.w3.org/TR/1999/WAI-WEBCONTENT-19990505>.

Appendix A
List of Organizations

1. U.S. Department of State (DoS)
2. Interdepartment Radio Advisory Committee (IRAC)
 - Radiocommunication Subcommittee (RCS)
 - Frequency Assignment Subcommittee (FAS)
 - Spectrum Planning Subcommittee (SPS)
 - Space Systems Subcommittee (SSS)
 - Various Ad Hoc committees such as AH 206, etc.
3. U.S. Department of Commerce (DoC)
4. National Telecommunications and Information Administration (NTIA)
5. National Oceanic and Atmospheric Administration (NOAA)
6. Federal Communications Commission (FCC)
7. Allied Radio Frequency Agency (ARFA)
8. Department of Defense (DoD)
9. Department of Energy (DoE)
10. Department of Homeland Security (DHS)
11. Department of Transportation (DoT)
12. National Reconnaissance Office (NRO)
13. Joint Spectrum Center (JSC)
14. National Science Foundation (NSF)
15. National Academy of Science (NAS)
16. Telecommunications Industry Association (TIA)
17. Committee on Radio Frequencies (CORF) of the National Research Council
18. Office of Spectrum Analysis Management (OSAM)

Appendix B
LIST OF ABBREVIATIONS:

APT – Asian-Pacific Telecommunications organization
ARFA – Allied Radio Frequency Agency
CCSDS – Consultative Committee for Space Data Systems
CEPT – European Conference of Postal and Telecommunications Administrations
CEV – Crew Exploration Vehicle
CITEL – Telecommunications Commission of the Organization of American States
COMSEC – Communications Security
CORF – Committee on Radio Frequencies of the National Research Council
CPM – Conference Preparatory Meeting
DoC – U.S. Department of Commerce
DoD – U.S. Department of Defense
DoE – U.S. Department of Energy
DHS—Department of Homeland Security
DoS – U.S. Department of State
DoT – U.S. Department of Transportation
EESS – Earth exploration-satellite service
ESA – European Space Agency
FAS – Frequency Assignment Subcommittee
FCC – Federal Communications Commission
FMG – Frequency Management Group
FSS – Fixed-satellite service
GHz – Gigahertz
GPS – Global Positioning System
GWAC – Government Wide Agency Contract
WARC –World Administrative Radiocommunications Conference
IRAC – Interdepartmental Radio Advisory Committee
ISS – International Space Station
ITU – International Telecommunication Union
ITU-R – International Telecommunications Union -Radiocommunications Sector
WP – Working Party
JAXA – Japan Aeronautics and Space Agency
JRG – Joint Rapporteurs Group
JSC – Joint Spectrum Center
JWP – Joint Working Party
MHz – Megahertz
MSS – Mobile-satellite service
NAS – National Academy of Sciences
NASA – National Aeronautics and Space Administration
NGSO – Non-geostationary orbit
NOAA – National Oceanic and Atmospheric Administration
NPRM – Notice of Proposed Rule Making
NRMC – Negotiated Rulemaking Committee

NRO – National Reconnaissance Office
NSF – National Science Foundation
NTIA – National Telecommunications and Information Administration
NWAG – NASA WRC Advisory Group
OSAM – Office of Spectrum Analysis Management
PFD – Power Flux Density
RA – Radiocommunication Assembly
RCS – Radiocommunication Subcommittee
RNSS – Radionavigation-satellite service
RRB – Radio Regulations Board
SFCG – Space Frequency Coordination Group
SIO – Scientific and Industrial Organization
SRS – Space Research Service
SSS – Space Systems Subcommittee
STS – Space Transportation System (i.e., Shuttle)
TDMA – Time Division Multiple Access
TG – Task Group
TIA – Telecommunications Industry Association
WRC – World Radiocommunication Conference