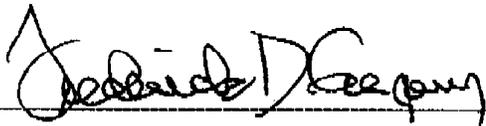


MEMORANDUM OF AGREEMENT
FOR THE MANAGEMENT OF
NASA'S SPACE COMMUNICATIONS
NETWORKS

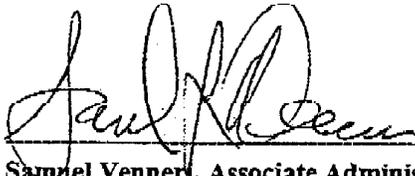
May 9, 2002

Memorandum of Agreement for the Management of NASA's Space
Communications Networks



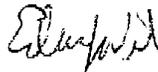
Frederick Gregory, Associate Administrator
Office of Space Flight

13 May 02
Date



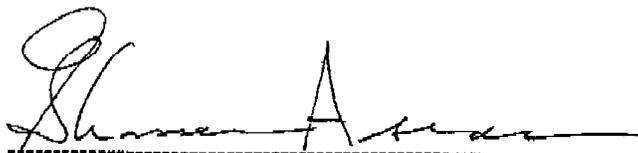
Samuel Venneri, Associate Administrator
Office of Acrospace Technology

MAY 17, 02
Date



Edward Weiler, Associate Administrator
Office of Space Science

7-10-02
Date



Ghassem Asrar, Associate Administrator
Office of Earth Science

12 September 2002
Date

Memorandum of Agreement for the Management of NASA's Space Communications Networks

Background

Over its history NASA has operated hundreds of robotic space missions, thousands of suborbital missions and flight tests, and placed humans in space as part of the International Space Station, Space Transportation System, Apollo, Gemini, and Mercury programs. In order to operate these missions, NASA built a backbone of communications capabilities that reliably transmit data between the ground control centers and the flight missions. These capabilities in general keep the missions operating safely and return volumes of science and technology data that has led to innumerable discoveries about the Earth, the solar system, and the universe. Today this capability can be best described as composed of five networks: the Space Network (SN), the Ground Network (GN), the Deep Space Network (DSN), the NASA Integrated Services Network (NISN), and the Western Aeronautical Test Range (WATR).

Historically, these networks have been managed by a central telecommunications organization at NASA HQ and have been funded through specific program elements in the NASA appropriation. In the past several years, the budgets for operating and investing in the networks have been reduced dramatically. In 2001, NASA management recognized that the space communications budget situation had become critical and was inadequate to keep pace with the investments in the flight programs served by the networks. In order to resolve the situation, NASA strategically aligned the budgets of the networks with the Enterprises who are the primary users of the respective networks. Thus program management and budget responsibility for the Deep Space Network was transferred to the Office of Space Science (OSS), the Ground Network to the Office of Earth Science (OES), and the WATR to the Office of Aerospace Technology (OAT). The Office of Space Flight (OSF) has the management and budget responsibilities for the Space Network and NISN.

Scope

This Memorandum of Agreement among OSF, OSS, OES, and OAT lays out the principles for coordinated management of NASA's space communications networks. It further defines a framework for organizational structures that will provide the necessary coordination and execution of the common functions.

There are common and shared capabilities and functions of these networks for all NASA programs and operations. With the strategic realignment of these networks with the Enterprises, there is the responsibility to manage these networks for the benefit and utility for all of NASA. Similarly there are responsibilities to organize and execute common elements and functions to external organizations through existing or new agreements with

NASA. Usually these agreements are partnered with one of the several NASA users of the space communications networks.

The Management Principles

The principles which will govern the coordinated management of the networks are:

- These are NASA networks and are to be operated for the benefit of all NASA programs. The five networks comprise NASA's architecture for space communications.
- Enterprises are defined as managing Enterprises (those assigned responsibility for a specific network) and using Enterprises (those using the capabilities of another Enterprise's network).
- The managing Enterprises recognize the need to study future directions of NASA's space communications architecture, arrive at common decisions on the evolution of this architecture, and advocate for appropriate investment resources in line with the common decisions. The Enterprises will look at long-term needs for architecture changes in addition to the short-term upgrade requirements.
- Programmatic drivers are fundamental to determining the priority for employing existing capacity as well as investing in new capability. The managing Enterprise determines the programmatic drivers for their network and will allocate available capacity on their network for the using Enterprises.
- When a formal agreement with an external entity is required for a given network, the managing Enterprise will conduct the negotiations and sign the agreement.
- Since each network is designed for different purposes, there are occasions when a project sponsored by a using Enterprise will require new capabilities on a network. The using Enterprise will provide funding for the creation of, a program-driven, unique network capability if it is not consistent with the defined network architecture or if the request is inside the budget window. For longer term, new network capabilities consistent with the defined network architecture, the managing Enterprise will incorporate the funding requirements into the baseline budget for the network.

Space Communications Networks Management Coordination

There is a need to maintain a NASA-wide perspective and coordination of the networks for crosscutting functions, such as spectrum management, interoperability, communications standards, and future architecture. In order to provide the framework for this coordination, the managing Enterprises agree to form the Space Communications

Management Council comprised of the Deputy Associate Administrators for OSF, OES, and OSS. Other members to this council will be invited as appropriate. The Council will provide guidance relative to NASA management policies and other directives. The Space Communications Management Council will provide the leadership to set the agenda for future directions of the space communications architecture.

To provide oversight of the networks, OSF, OES and OSS shall each designate a Program Executive (PE) to be the point of contact on matters related to space communications. The Program Executives will negotiate and accept requirements for the Enterprise (for the networks they manage) and will provide oversight of the operations of those network(s).

The OSF DAA for Space Communications and the PE's will constitute the Space Communications Coordination and Integration Board (SCCIB) that reports to the Space Communications Management Council. Other Enterprises will participate on the Space Communications Coordination and Integration Board as appropriate. The SCCIB will oversee development of the architecture plan and will be the focus for implementing that plan, in conjunction with the Centers. They will represent the priorities of the missions using each network, monitor allocation of capacity of the networks, and provide a forum for resolving prioritization conflicts in using the network capacity. The SCCIB will coordinate and integrate such crosscutting issues as:

- Network priorities, capacities and capabilities
- Reporting metrics for space communications
- Communications and data system architecture
- Technology developments
- Communication, control and data standards
- Spectrum Management
- Mission support model

The chairmanship of the Space Communications Coordination and Integration Board will rest with the DAA for Space Communications. The Board will meet regularly and as topics arise that need to be addressed. Board members will keep each other apprised of activities within and planned enhancements to the networks for which they are responsible. The PE's will represent to the Board the concerns of their facilities and Enterprise programs that utilize space communications assets.

Several working groups will be established as standing bodies. Other working groups may be established as required to address specific issues. The PE's or their designated representatives will constitute the working groups. The SCCIB will generally charter these working groups. Charters for these working groups will be established and appended to later versions of this document. These working groups will include:

- An Architecture Steering Group (ASG). This group will set a long-term vision for space communications by developing a future crosscutting architecture for space communications. They will ensure that the direction being taken for the

future architecture is in line with the strategic plans of the Enterprises and the agency. They will develop a plan and roadmap for getting to the future architecture and bring that plan to the SCCIB for concurrence and recommendation to the DAA's. The architecture steering group will include representatives from multiple centers and will cover all aspects of space communications.

- A Technology Working Group. This working group will forward to the ASG and SCCIB ideas for crosscutting technologies in space communications that should be pursued to implement future architectures. They will also help build business cases that can be used by the Enterprises to obtain funding for these crosscutting space communications technologies. The technology working group will include representatives from multiple centers and will cover all aspects of space communications.
- A Frequency Management Liaison Group. This group will address issues relating to spectrum allocation and utilization across the agency. It will report to the ASG (and the SCCIB as appropriate). It will represent the agency in interagency and international forums on this topic. The frequency management working group will include representatives from multiple centers and will cover all aspects of frequency management.
- A Data Standards Working Group. This group will address all communications standards for the agency. It will report to the ASG (and SCCIB as appropriate). It will represent the agency in interagency and international forums on this topic. The data standards working group will include representatives from multiple centers and will cover all aspects of communications standards.
- A Space Communications User's Forum. This forum will provide feedback to the SCCIB on the interfaces among the networks, CSOC, and the Centers. The forum will consist of representatives from both the service providers and the users of space communications services and will cover all Centers. It will recommend processes that work well at one Center for implementation at other Centers. It will also alert the SCCIB to procedural and contractual impediments to efficient operation of the Centers.

Roles and Responsibilities

Each Enterprise Associate Administrator [AA] is responsible for providing funding, authority, accountability, and management direction for their portion of the NASA space communication capabilities. The Enterprises will look at space communications from a long-term perspective for planning purposes and will provide that long-term vision to the PE's for implementation, in conjunction with the Centers.

To provide visibility into space communications, the Enterprises will jointly present to the HQ Program Management Council (PMC). Briefings to that PMC for crosscutting issues will be accomplished by DAA for Space Communications. For reporting purposes, the monthly review for Space Communications will cover the high-level, crosscutting activities. Network reporting to their Enterprise will be accomplished through the standing monthly mechanisms used by each Enterprise. The PE's will provide updates on major issues within each network during their regular meetings.

In matters pertaining to general inquiries on overall space communications for the agency, OSF will respond to inquiries from the Congress, the Administration, outside agencies, international partners, etc. in coordination with the other Enterprises. In matters pertaining to a specific network, the inquiries will be routed to the appropriate Enterprise for disposition. The Program Executives will keep the SCCIB informed as to the status of the responses being worked by their Enterprises.

The restructuring described above has aligned managerial and budgetary control of the facilities with the Enterprises whose requirements drive the upgrades and enhancements of those facilities. To further define the management and control responsibilities, separate Operating Plans will be produced by OSS for the DSN, by OES for the GN, and by OSF for the SN and NISN. The WATR will be managed by DFRC with OAT oversight and will reestablish agreements with other centers as necessary to ensure uninterrupted support of non-OAT projects, (e.g. STS, ISS, X-38).

Funding

In FY03 and beyond, each Enterprise exercises managerial and budgetary control over those space communications networks for which it has primary responsibility. This funding will encompass operations of and upgrades to their network, technology and standards initiatives being performed at their Center, and local Center spectrum activities. Funding for the management of crosscutting activities such as spectrum management and standards development will be budgeted for and held in OSF. The other Enterprises, through the SCCIB, will help clarify the appropriate funding levels and will assist OSF in defending the funding requirements for these activities. At present, funding for the CSOC contract will be provided to the JSC to be placed on the contract.

- All DSN funds will be held in OSS and will be dispersed to the Jet Propulsion Laboratory, CSOC, international service providers, or other contractor(s) as appropriate.
- All GN funds will be held in OES and will be dispersed to the Goddard Space Flight Center (GSFC), CSOC, or other contractor(s) as appropriate.
- All SN funds will be held in OSF and will be dispersed to the GSFC, CSOC, or other contractor(s) as appropriate.

- All NISN funds for infrastructure support will be held in OSF and will be dispersed to the Marshall Space Flight Center, CSOC, or other contractor(s) as appropriate. Funding for mission requirements for NISN will be provided by the using Enterprise.
- All WATR funds will be held in OAT and will be dispersed to the Dryden Flight Research Center.

In accordance with the management principles, the managing Enterprises will fund a base level of network capability and capacity. Using Enterprises will reimburse the managing Enterprise for the creation of new program-driven capabilities if the request for the enhancement is inside the budget window or does not conform to the defined network architecture. Funding for space communications technology activities sponsored by the SCCIB will be provided separately for each activity. Each of these activities will be approved as a separate project with a plan, budget, schedule, milestones, and a definition of the stakeholders who would be willing to support the work. Funding will be provided in accordance with the plan. Funding for space communications technology activities being performed for an individual Enterprise will be managed according to the policies of that Enterprise.

The Consolidated Space Operations Contract

In 1999, NASA secured the Consolidated Space Operations Contract (CSOC) with the Lockheed Martin Space Operations Corporation. This contract provides a wide range of services at all NASA Centers in support of the elements of the Space Communications Networks. These services are ordered via several mechanisms defined in the contract and funded from a variety of program funds. OSF, working with the Johnson Space Center (JSC), administers the overall contract. The JSC staff provides support to other Center and project staffs and Program Executives in matters pertaining to the management of the contract.

The specific responsibilities with respect to this contract for the OSF, OSS and OES Enterprises include:

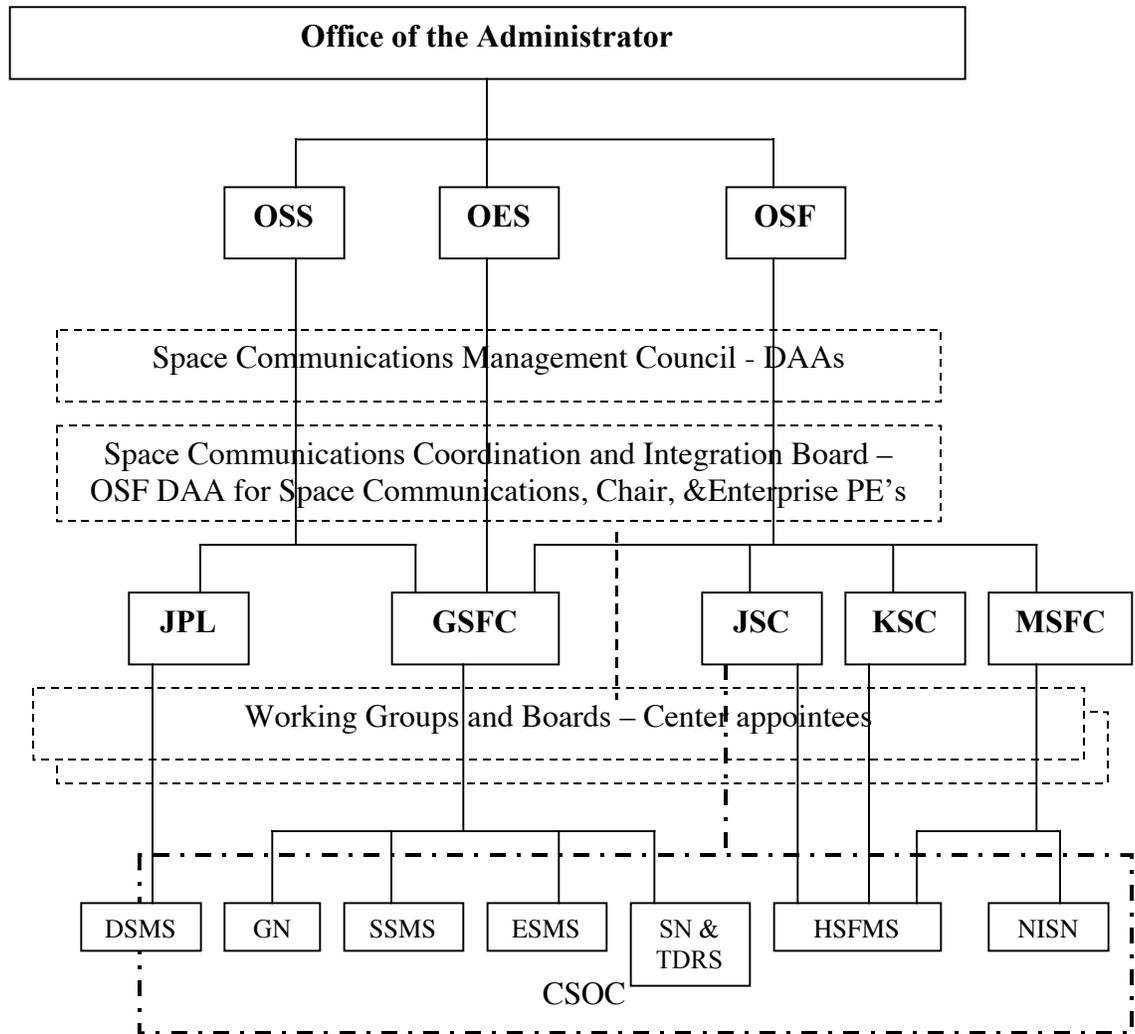
- Setting requirements for their networks
- Ensuring that the Centers fulfill those requirements via traceable lines of authority and accountability from the managing Enterprise through the Center to the contract
- Providing funding for their networks
- Monitoring expenditures of those funds
- Providing input to and participating as voting members of the Performance Evaluation Board (comprised of the Program Executives from OSF, OSS, and OES).

The additional specific responsibilities for OSF include working with JSC to track the costs of the overall CSOC contract as well as chairing the Performance Evaluation Board. Pursuant to the Contracting Officer letter of January 29, 2002, the Centers will have delegated contracting officer authority with the overall Contracting Officer for the CSOC remaining at the JSC.

The budget process for space communications activities follows the standard path of guidelines from Enterprise to Center to Program to Project and the submission process in the reverse order. The Center managers of elements under CSOC will work budget plans with their CSOC counterparts and submit budgets up the chain previously described. Providing funding to the contract will be the responsibility of the Center resource managers. The JSC contract administrators and budget personnel will ensure that all funds received are quickly placed on the contract and will notify the centers and the PE's when projects have not adequately funded the contract for their support.

Each Center will have a Configuration Control Board (CCB) to approve contract changes that have only a local Center, single network impact. For any changes that are strategic or broad scope in nature, or that cross Center or network boundaries, a Central CCB will approve the changes. This CCB will reside at HQ and be chaired by OSF.

MOA for the Management of NASA's Space Communications Networks



Acronyms

CSOC	Consolidated Space Operations Contract
DAA	Deputy Associate Administrator
DSMS	Deep Space Mission System
ESMS	Earth Science Multi-mission Services
GN	Ground Networks
GSFC	Goddard Space Flight Center
HSFMS	Human Space Flight Multi-mission Services
JPL	Jet Propulsion Laboratory
JSC	Johnson Space Center
KSC	Kennedy Space Center
MOA	Memorandum Of Agreement
MSFC	Marshall Space Flight Center

NISN	NASA Integrated Services Network
OES	Office of Earth Science
OSF	Office of Space Flight
OSS	Office of Space Science
PE	Program Executive
SN	Space Network
SSMS	Space Science Multi-mission Services
TDRS	Tracking and Data Relay Satellite

Legend

Organization

CSOC

MOU: Council, Board, Working Groups