

9/13/96

## TRACKING, DATA ACQUISITION, AND COMMUNICATIONS SERVICE LEVEL AGREEMENT

### 1.0 Scope

The services and associated performance metrics to be provided under this Tracking, Data Acquisition, and Communications (TDAC) Service Level Agreement (SLA) include the current System Engineering and Analysis Support (SEAS) tasks, Network and Mission Operations Support (NMOS) Statement of Work (SOW), and the Wallops SOW. The TDAC SLA consists of four main categories of services: Communications; Tracking; RF and Data Services; and Operations Management. Definitions of most of the terms used in this SLA can be found in the appendix.

The order of precedence is: current SOWs for the NMOS, SEAS, and Wallops support contracts (including applicable documents); Technical Directions; then the SLA/GSA. The implication here is that the work the contractors have always done will continue to be done as the institution of the SLA does not abrogate the need for the SOWs.

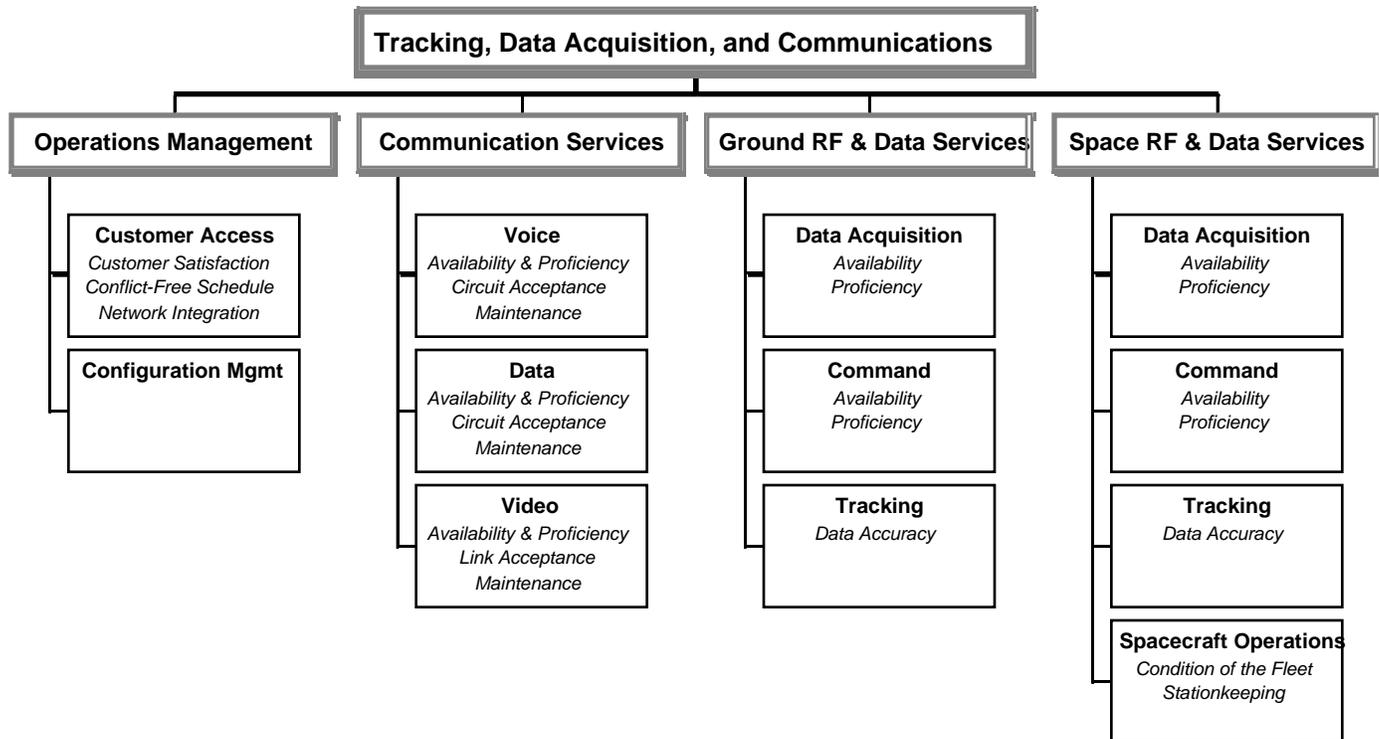
In general, the government shall endeavor to not request meetings for the purpose of obtaining information about projects or activities. This implies that the contractor shall invite the responsible Civil Servant to all appropriate technical meetings being held by the contractors. The purpose of these meetings shall be the exchange of information on activities being performed by the contractor.

The government facilities included in this SLA are:

Facilities	Services
White Sands Complex (WSC)	Continuous
Network Control Center (NCC)	Continuous
Bermuda tracking station (BDA)	40 hours/week
Merritt Island, Florida tracking station (MIL)	80 hours/week
Ponce de Leon, Florida tracking station (PDL)	40 hours/week
Wallops Orbital Tracking Station (WOTS)	Continuous
Wallops Transportable Orbital Tracking Stations (TOTS) 1, 2, and 3	40 hours/week
Wallops McMurdo station	40 hours/week
WFF Range Instrumentation	40 hours/week
GRTS	Continuous
Nascom	Continuous

Continuous services are defined as 24 hours/day, 7 days/week.

Figure 1 shows the overall structure of the SLA. The items in italics are the metrics for each of



the services listed.

**Figure 1. TDAC SLA Structure**

- Metrics shall be compiled and distributed to SLA TAO/Deputies monthly.
- Status reviews (ops/engineering) will be conducted periodically, for the purpose of providing NASA insight into CNMOS activities, performance, cost, and schedules.
- The CNMOS contractor shall support reviews/inquiries requested by the TAO.

The contractor shall provide cost and resource management and control of the tracking, data acquisition, and communication services, including schedule, status, cost, and performance reports. NASA will provide guidance on mission/project priorities.

## **2.0 Operations Management Services**

Operations management services shall encompass the full life cycle of missions and projects, including mission planning, mission execution, configuration management, and participation in development projects. These services are described in the sections below.

### **2.1 Mission Planning**

#### **2.1.1 General**

The contractor shall provide mission planning services to ensure network and mission readiness and that TDAC can provide the required customer support. The mission planning services include requirements analysis to ensure compatibility between customers and TDAC, input to NOSP and Operational Concept documents, database development, proof of concept support for new customers, and testing. The contractor shall perform Network integration and testing, including system testing, Network testing, and readiness testing to verify and validate customer access capabilities, which can encompass network integration of various tracking networks for mission support. The contractor support shall include development and maintenance of test plans, procedures and schedules, as well as test planning and coordination, test execution, and test results reporting. The contractor support shall also include training of new customers, operations personnel training for new systems, and assistance in the resolution of issues and anomalies discovered during testing.

#### **2.1.2 Mission Planning Performance Parameters**

The final performance parameter for mission planning is the operational proficiency for that customer or project. Intermediate performance parameters are needed to ensure NASA insight into potential problems. The intermediate mission planning performance parameters are:

- o Develop and maintain necessary test plans and procedures.
- o Execute tests and report results.

#### **2.1.3 Mission Planning Metrics**

- o Timeliness and completeness of delivered products per negotiated schedules.
- o No critical customer access anomalies found after launch.
- o No critical operational problems found after launch.

### **2.2 Mission Execution**

#### **2.2.1 General**

The contractor shall provide operations and maintenance for NCC systems, including resource allocation (scheduling), network operations direction, end-to-end fault isolation, service

restoration, and the implementation of contingencies to support unplanned and unscheduled spacecraft support emergencies. Other mission execution functions include network and system performance evaluation, training (including certifications), and technical reporting.

### 2.2.2 Mission Execution Performance Parameters

The performance parameters for mission execution are the delivery of the NCC services, including scheduling and real-time operations, to the customers with agreed on quality and reliability. For scheduling, the performance parameter is the production and distribution of conflict-free schedules. The performance parameters for real-time operations are operational proficiency and systems availability. An overall indication of performance is customer satisfaction. The goals for the NCC are as follows:

Operational Proficiency	99.8%
Systems Availability (prime)	99.5%
Customer Access	95%

The performance parameter for maintenance of backup systems shall be maintenance records and down-time records.

### 2.2.3 Mission Execution Metrics

2.2.3.1 The metrics for generation and maintenance of conflict free schedules shall be:

$$\text{Access} = \frac{\text{Events Scheduled}}{\text{Events Requested}}$$

2.2.3.2 The systems availability metric is intended to reflect the quality of engineering and maintenance. The definition of system availability is as follows:

$$\text{Systems Availability} = \frac{\text{Required Available Service Time} - \text{Lost Service Time}}{\text{Required Available Service time}}$$

Required Available Service Time is defined as the total time in minutes for the specified reporting period that the specified service is required to be available for use by customers. Currently, this does not include planned downtimes (such as times when the system is scheduled down for preventative maintenance, corrective maintenance, software deliveries, etc.). Units are minutes of time.

Lost Service Time is defined as the total time that service is unavailable for use by customers regardless of whether support was scheduled by the customer or not. Currently, this does not include times reported for data degradation. Units are minutes of time.

2.2.3.3 The Operational Proficiency metric is a measure of customer service impact due to operator errors or equipment failures. This metric shall be calculated as an overall average for the facility (rather than on a per-customer basis).

$$\text{Operational Proficiency} = \frac{\text{Scheduled Service Time} - \text{Lost Data Time}}{\text{Scheduled Service Time}}$$

Scheduled Service Time is defined as the total time that customers requested and were granted service time. Units are minutes of time.

Lost Data Time is defined as the total time that customers requested and were granted service time and for which the service was not available. For the NCC this includes ODM/GCMR capability. Time periods for which data is degraded is not counted as lost scheduled service time. Units are minutes of time. This is defined as those deficiencies and/or failures which are within the control of the CNMOS contractor.

2.2.3.4 For customer satisfaction, a survey will be solicited monthly from a broad base of service users. This survey shall solicit responses for both routine and critical levels of support. The survey will encompass the following areas:

1. Quality of service
2. Level of service (quantity)
3. Responsiveness (timeliness/completeness)
4. Quality of personnel communications (interface)
5. Ease of use (user friendliness)
6. Access (frequency of contact required to schedule service)

Because of the subjective nature of this type of evaluation, customer surveys will be evaluated on trends over a period of 6 months rather than isolated problems. However, all problems identified in the survey data will be investigated and addressed as they occur.

## **2.3 Configuration Management**

### **2.3.1. General**

The contractor shall maintain a documented configuration baseline for all systems and facilities for which they are responsible. This baseline shall consist of hardware, software, firmware, and documentation. The contractor shall also support configuration management for development efforts. This shall entail supporting development projects whose purpose is to develop systems or software to be installed in the facilities covered by this SLA and assisting them in documenting their installation.

### **2.3.2 Configuration Management Performance Parameters**

- Maintain a current documented configuration baseline description
- Manage a configuration change process

### **2.3.3 Configuration Management Metrics**

- No loss of ISO certification due to CM problems
- Timeliness and completeness of identified CM reports

## **2.4 Operations Participation in Development**

### **2.4.1 General**

The interdependence of development and operations and the sharing of resources heightens the need for the participation of operations in development areas such as evaluating new products or systems for operational usability in support of TDAC services. This evaluation support is vital, especially during design and development activities and the integration of new systems into the operational areas. Ops participation also includes requirements analysis, planning, and integration. The contractor shall operate and maintain systems used for development, as required. For all items delivered by the NCC Project for operational usage, the contractor shall perform operational acceptance tests and verify and validate requirements. The contractor shall also verify that the NCC systems are capable of supporting Network operations. The contractor shall also support engineering interface testing with Space Network elements and customers based upon changes to their systems or change to the NCC. The contractor support shall also include benchmark test development, coordination of training and documentation updates required for each delivery, operational transition support, and NCC 98 liaison program support.

### **2.4.2 Operations Participation in Development Performance Parameters**

- o Develop and maintain necessary test plans and procedures.
- o Execute tests and report results.
- o Develop and maintain NCCDS Benchmark Test, including test data.
- o Manage training, documentation and operational transition for each NCC system delivery.

### **2.4.3 Operations Participation in Development Metrics**

- o Timeliness and completeness of delivered products, including Benchmark, per negotiated schedules.
- o No critical operational problems found after NCC system delivery to operations.