Software Engineering Institute

Data Rights for Proprietary Software Used in DoD Programs

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About This Report

This technical note is a result of work that was done for the Transformational Satellite Communications System (TSAT) program. While writing the Request for Proposal (RFP) for the TSAT Mission Operations Segment (TMOS), data rights for proprietary software were considered and the TMOS team wrote specific data rights language. This language was then refined for the Space Segment source selection. The result of that work forms the basis for this report in the hope that it will provide assistance to other Department of Defense (DoD) programs facing similar challenges. There is also one section that describes the approach the Global Positioning System (GPS) program office took toward data rights. Its approach was different from the TSAT approach, but should be considered when a program is determining how to approach software data rights.

Abstract

The Department of Defense (DoD) is increasingly acquiring complex systems that use commercial software to meet many of the systems' functional requirements. If the commercial software is a truly commercial product and will not be modified (for example, a commercial antivirus program), then for most systems, data rights do not become an issue. However, when the commercial software is based on proprietary software that is not available as a standard commercial product or will be modified such that the end product is no longer commercially available or is different from the standard commercial product (for example, adding program specific capabilities to a database program), the DoD must consider what data rights are necessary.

This paper

- examines how data rights issues were addressed in the Transformational Satellite Communications System (TSAT) program

- reviews additional concerns posed by the use of commercial software in the TSAT program's Space Segment, including safety and mission assurance, and how those concerns were addressed

- reviews, in less detail, data rights concerns for software incorporated in the Global Positioning System program, and how those concerns were addressed

1 Introduction

This technical note was written to document the data rights language used in the TSAT program. The approach was different from what had been used previously by the Space and Missile Systems Center (SMC) due to the desire to use commercial products. The TMOS and TSAT experiences are meant as examples only, are not necessarily comprehensive, and should be reviewed and adapted if used for other programs.

Sections 2-6 of this report all have the same format. They all begin with an explanation of what occurred on the TMOS and Space Segments. These explanations are meant to help with the understanding of the general recommendations and lessons learned. If you are only interested in the general guidance you can skip directly to those sections.

Section 7 describes the approach the GPS program took with regards to data rights.

Section 8 includes contract language from both TSAT and GPS.

FAR and DFAR documents can be found at the following web address: http://farsite.hill.af.mil/

NOTE: Throughout the report, direct quotations from FAR and DFAR documents will be formatted in a sans-serif typeface:

This is an example of a direct quote from FAR.

2 Terminology

This section will define the basic terminology used in this technical note. These definitions include both terminology for software classes and data rights. Where applicable, the definitions are taken from federal acquisition regulation (FAR) or defense federal acquisition (DFAR) references. Since the FAR and DFAR are subject to change, be sure to refer to a current copy of these regulations before using the definitions in any contractual documents.

Definitions specific to the data rights issue will be defined in Section 4.

2.1 Software Categories

When dealing with software data rights the authors considered different categories of software. Terminology related to these different categories is discussed below and encompasses new, reuse and COTS software.

2.1.1 Commercial Off-The-Shelf Component

A component that is (a) sold, leased, or licensed to the general public, (b) offered by a vendor trying to profit from it, (c) supported and evolved by the vendor, who retains the intellectual property rights, (d) available in multiple, identical copies; used without modification of the internals [Oberndorf 2000].

2.1.2 Commercial Item

The FAR (2.101) definition is as follows:

"Commercial item" means —

(1) Any item, other than real property, that is of a type customarily used by the general public or by non-governmental entities for purposes other than governmental purposes, and —

   (i) Has been sold, leased, or licensed to the general public; or,

   (ii) Has been offered for sale, lease, or license to the general public;

(2) Any item that evolved from an item described in paragraph (1) of this definition through advances in technology or performance and that is not yet available in the commercial marketplace, but will be available in the commercial marketplace in time to satisfy the delivery requirements under a Government solicitation;

(3) Any item that would satisfy a criterion expressed in paragraphs (1) or (2) of this definition, but for —

   (i) Modifications of a type customarily available in the commercial marketplace; or

   (ii) Minor modifications of a type not customarily available in the commercial marketplace made to meet Federal Government requirements. Minor modifications means modifications that do not significantly alter the

nongovernmental function or essential physical characteristics of an item or component, or change the purpose of a process. Factors to be considered in determining whether a modification is minor include the value and size of the modification and the comparative value and size of the final product. Dollar values and percentages may be used as guideposts, but are not conclusive evidence that a modification is minor;

(4) Any combination of items meeting the requirements of paragraphs (1), (2), (3), or (5) of this definition that are of a type customarily combined and sold in combination to the general public;

(5) Installation services, maintenance services, repair services, training services, and other services if —

(i) Such services are procured for support of an item referred to in paragraph (1), (2), (3), or (4) of this definition, regardless of whether such services are provided by the same source or at the same time as the item; and

(ii) The source of such services provides similar services contemporaneously to the general public under terms and conditions similar to those offered to the Federal Government;

(6) Services of a type offered and sold competitively in substantial quantities in the commercial marketplace based on established catalog or market prices for specific tasks performed or specific outcomes to be achieved and under standard commercial terms and conditions. For purposes of these services —

(i) "Catalog price" means a price included in a catalog, price list, schedule, or other form that is regularly maintained by the manufacturer or vendor, is either published or otherwise available for inspection by customers, and states prices at which sales are currently, or were last, made to a significant number of buyers constituting the general public; and

(ii) "Market prices" means current prices that are established in the course of ordinary trade between buyers and sellers free to bargain and that can be substantiated through competition or from sources independent of the offerors.

(7) Any item, combination of items, or service referred to in paragraphs (1) through (6) of this definition, notwithstanding the fact that the item, combination of items, or service is transferred between or among separate divisions, subsidiaries, or affiliates of a contractor; or

(8) A nondevelopmental item, if the procuring agency determines the item was developed exclusively at private expense and sold in substantial quantities, on a competitive basis, to multiple State and local governments.

2.1.3   Proprietary Software (Developed at Private Expense)

The DFARS definition (252.227-7013) is as follows:

"Developed exclusively at private expense" means development was accomplished entirely with costs charged to indirect cost pools, costs not allocated to a government contract, or any combination thereof.

(i)   Private expense determinations should be made at the lowest practicable level.

(ii)   Under fixed-price contracts, when total costs are greater than the firm-fixed-price or ceiling price of the contract, the additional development costs necessary to complete development shall not be considered when determining whether development was at government, private, or mixed expense.

2.1.4   Software Developed at the DoD's Expense

The DFARS (252.227-7013) definition is

"Developed exclusively with government funds" means development was not accomplished exclusively or partially at private expense.

In some instances, DoD systems are developed using a mixture of funding. The DFAR definition is

"Developed with mixed funding" means development was accomplished partially with costs charged to indirect cost pools and/or costs not allocated to a government contract, and partially with costs charged directly to a government contract.

2.1.5   Restricted Computer Software

The FAR (52.227-14) definition is

[C]omputer software developed at private expense and that is a trade secret, is commercial or financial, and is confidential or privileged; or is published copyrighted computer software, including minor modifications of such computer software.

2.2 Categories of Data Rights

There are different categories for computer software and hardware data rights. The software data rights from FAR are in section 252.7014; from DFARS they are found in DFARS 227.7203-5, Government rights.

The standard license rights in computer software that a licensor grants to the Government are unlimited rights, Government purpose rights, or restricted rights. The standard license in computer software documentation conveys unlimited rights. Those rights are defined in the clause at FAR 252.227-7014, Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation. In unusual situations, the standard rights may not satisfy the Government's needs or the Government may be willing to accept lesser rights in return for other consideration. In those cases, a special license may be negotiated. However, the licensor is not obligated to provide the Government greater rights and the contracting officer is not required to accept lesser rights than the rights provided in the standard grant of license.

The situations under which a particular grant of license applies are enumerated in paragraphs (a) through (d) of DFAR 227.7203-5. For hardware data rights, DFAR states in SUBPART 227.4—RIGHTS IN DATA AND COPYRIGHTS, 227.400 Scope of subpart:

DoD activities shall use the guidance in Subparts 227.71 and 227.72 instead of the guidance in FAR Subpart 27.4. Subparts 227.71 and 227.72 call out the same categories for hardware data rights, unlimited, Government purpose, or restricted rights.

2.2.1 Limited Rights

Note that the definitions in FAR clause 252.227-7013 do not pertain to computer software. They have been included for completeness. The FAR definition of limited rights (252.227-7013) is as follows:

(13) "Limited rights" means the rights to use, modify, reproduce, release, perform, display, or disclose technical data, in whole or in part, within the Government. The Government may not, without the written permission of the party asserting limited rights, release or disclose the technical data outside the Government, use the technical data for manufacture, or authorize the technical data to be used by another party, except that the Government may reproduce, release or disclose such data or authorize the use or reproduction of the data by persons outside the Government if reproduction, release, disclosure, or use is —

  (i)   Necessary for emergency repair and overhaul; or

  (ii)   A release or disclosure of technical data (other than detailed manufacturing or process data) to, or use of such data by, a foreign government that is in the interest of the Government and is required for evaluational or informational purposes;

  (iii)   Subject to a prohibition on the further reproduction, release, disclosure, or use of the technical data; and

  (iv)   The contractor or subcontractor asserting the restriction is notified of such reproduction, release, disclosure, or use.

2.2.2 Unlimited Rights

The FAR definition of unlimited rights (27.401) is as follows:

"Unlimited rights" means the rights of the Government to use, disclose, reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, in any manner and for any purpose, and to have or permit others to do so.

And the DFARS clause dealing with unlimited rights with respect to software (52.227-05) states:

(a) *Unlimited rights.* The Government obtains an unlimited rights license in —

  (1)   Computer software developed exclusively with Government funds;

  (2)   Computer software documentation required to be delivered under a Government contract;

  (3)   Corrections or changes to computer software or computer software documentation furnished to the contractor by the Government;

  (4)   Computer software or computer software documentation that is otherwise publicly available or has been released or disclosed by the contractor or subcontractor

without restrictions on further use, release or disclosure other than a release or disclosure resulting from the sale, transfer, or other assignment of interest in the software to another party or the sale or transfer of some or all of a business entity or its assets to another party;

(5)   Computer software or computer software documentation obtained with unlimited rights under another Government contract or as a result of negotiations; or

(6)   Computer software or computer software documentation furnished to the Government, under a Government contract or subcontract with —

    (i)   Restricted rights in computer software, limited rights in technical data, or government purpose license rights and the restrictive conditions have expired; or

    (ii)   Government purpose rights and the contractor's exclusive right to use such software or documentation for commercial purposes has expired.

2.2.3   Government Purpose Rights

The DFARS (227.7203-5) defines government purpose rights as follows:

"Government purpose rights" means the rights to —

    (i)   Use, modify, reproduce, release, perform, display, or disclose technical data within the Government without restriction; and

    (ii)   Release or disclose technical data outside the Government and authorize persons to whom release or disclosure has been made to use, modify, reproduce, release, perform, display, or disclose that data for United States government purposes.

And government purpose is defined as follows:

"Government purpose" means any activity in which the United States Government is a party, including cooperative agreements with international or multi-national defense organizations, or sales or transfers by the United States Government to foreign governments or international organizations. Government purposes include competitive procurement, but do not include the rights to use, modify, reproduce, release, perform, display, or disclose technical data for commercial purposes or authorize others to do so.

2.2.4   Restricted Rights

The DFARS definition (52.227-05) of restricted rights is:

(c) Restricted rights.

(1)   The Government obtains restricted rights in noncommercial computer software required to be delivered or otherwise provided to the Government under a contract that were developed exclusively at private expense.

(2)   Contractors are not required to provide the Government additional rights in computer software delivered or otherwise provided to the Government with restricted

rights. When the Government has a need for additional rights, the Government must negotiate with the contractor to determine if there are acceptable terms for transferring such rights. List or describe all software in which the contractor has granted the Government additional rights in a license agreement made part of the contract (see paragraph (d) of this subsection). The license shall enumerate the specific additional rights granted to the Government.

2.2.5   Specially Negotiated Rights

The FAR definition of specially negotiated rights in under FAR 227.7103-5, Government rights. Note that the definitions in FAR clause 252.227-7013 do not pertain to computer software. They have been included for completeness.

The standard license rights that a licensor grants to the Government are unlimited rights, government purpose rights, or limited rights. Those rights are defined in the clause at 252.227-7013, Rights in Technical Data—Noncommercial Items. In unusual situations, the standard rights may not satisfy the Government's needs or the Government may be willing to accept lesser rights in data in return for other consideration. In those cases, a special license may be negotiated. However, the licensor is not obligated to provide the Government greater rights and the contracting officer is not required to accept lesser rights than the rights provided in the standard grant of license. The situations under which a particular grant of license applies are enumerated in paragraphs (a) through (d) of this FAR subsection. Paragraph d covers specifically negotiated rights as shown below:

(d) Specifically negotiated license rights.

    (1)   Negotiate specific licenses when the parties agree to modify the standard license rights granted to the Government or when the Government wants to obtain rights in data in which it does not have rights. When negotiating to obtain, relinquish, or increase the Government's rights in technical data, consider the acquisition strategy for the item, component, or process, including logistics support and other factors which may have relevance for a particular procurement. The Government may accept lesser rights when it has unlimited or government purpose rights in data but may not accept less than limited rights in such data. The negotiated license rights must stipulate what rights the Government has to release or disclose the data to other persons or to authorize others to use the data. Identify all negotiated rights in a license agreement made part of the contract.

    (2)   When the Government needs additional rights in data acquired with government purpose or limited rights, the contracting officer must negotiate with the contractor to determine whether there are acceptable terms for transferring such rights. Generally, such negotiations should be conducted only when there is a need to disclose the data outside the Government or if the additional rights are required for competitive reprocurement and the anticipated savings expected to be obtained through competition are estimated to exceed the acquisition cost of the additional rights. Prior to negotiating for additional rights in limited rights data, consider alternatives such as —

(i)   Using performance specifications and form, fit, and function data to acquire or develop functionally equivalent items, components, or processes;

(ii)   Obtaining a contractor's contractual commitment to qualify additional sources and maintain adequate competition among the sources; or

(iii)   Reverse engineering, or providing items from Government inventories to contractors who request the items to facilitate the development of equivalent items through reverse engineering.

2.2.6   DoD Policy

DoD policy is to only acquire the minimum necessary data rights when using commercial products, so each program needs to ensure they have determined what is actually required. The DoD policy regarding hardware is in FAR part 227.7102-1; the software-related policy is in 227.7202-1. Both are provided below.

2.2.6.1   227.7102-1 Policy

(a) DoD shall acquire only the technical data customarily provided to the public with a "commercial item" or process, except technical data that —

(1)   Are form, fit, or function data;

(2)   Are required for repair or maintenance of commercial items or processes, or for the proper installation, operating, or handling of a commercial item, either as a standalone unit or as a part of a military system, when such data are not customarily provided to commercial users or the data provided to commercial users is not sufficient for military purposes; or

(3)   Describe the modifications made at Government expense to a commercial item or process in order to meet the requirements of a Government solicitation.

(b) To encourage offerors and contractors to offer or use commercial products to satisfy military requirements, offerors and contractors shall not be required, except for the technical data described in paragraph (a) of this subsection, to —

(1)   Furnish technical information related to commercial items or processes that is not customarily provided to the public; or

(2)   Relinquish to, or otherwise provide, the Government rights to use, modify, reproduce, release, perform, display, or disclose technical data pertaining to commercial items or processes except for a transfer of rights mutually agreed upon.

2.2.6.2   227.7202-1 Policy

(a) Commercial computer software or commercial computer software documentation shall be acquired under the licenses customarily provided to the public unless such licenses are inconsistent with Federal procurement law or do not otherwise satisfy user needs.

(b) Commercial computer software and commercial computer software documentation shall be obtained competitively, to the maximum extent practicable, using firm-fixed-price contracts or firm-fixed-priced orders under available pricing schedules.

(c) Offerors and contractors shall not be required to —

(1) Furnish technical information related to commercial computer software or commercial computer software documentation that is not customarily provided to the public except for information documenting the specific modifications made at Government expense to such software or documentation to meet the requirements of a Government solicitation; or

(2) Relinquish to, or otherwise provide, the Government rights to use, modify, reproduce, release, perform, display, or disclose commercial computer software or commercial computer software documentation except for a transfer of rights mutually agreed upon.

3 Data Rights Risk Analysis

3.1 TMOS Experience

The TMOS team started by looking at the risks that would be introduced if data rights could not be obtained for proprietary software that is used to meet critical system requirements. There were four main risk areas:

(1) **Decreased development/integration visibility**
There will most likely be limited or no access to detailed design information and source code; the government will have overall decreased development visibility, and less insight into test and integration status.

(2) **Long-term sustainment issues**
The detailed design information and source code will not be delivered; the government will need to rely on the developing company for support throughout the entire TSAT lifetime.

(3) **Compatibility/interoperability issues**
The detailed design information and source code will not be delivered and the ability to integrate TSAT with future systems (backward compatibility/interoperability) will likely be affected.

(4) **Increased deployment costs**
The government may have to license each instance of the software separately; licensing fees can be excessive if the government needs additional sites.

TMOS reformulated these risks into the following if-then statements:

Decreased development/integration visibility

> If the government and other TSAT contractors have less visibility into development, test, and intra- and inter-segment integration due to restricted access to detailed design information and source code, then the development may not be defect-free, leading to late error discovery during test, or interoperability failure during integration.

Long-term sustainment issues

> If the government needs to rely solely on the developer for support throughout TSAT operational life due to detailed design information and source code not having been delivered, then the developer may charge an exorbitant price for sustainment or unilaterally choose to discontinue support.

Compatibility/interoperability issues

> If the government needs to rely solely on the developer for interoperability with future systems due to detailed design information and source code not having been delivered, then the developer may demand uncompetitive, undesirable terms of their involvement in the future systems.

Increased deployment costs

> If the government has to license each instance of the software separately, then the vendor may charge the government excessive fees to add sites at a later date.

3.2 Space Segment Experience

The Space Segment used the same risks as TMOS.

3.3 General Guidance

These risks would apply to most large DoD acquisitions. Some acquisitions may identify additional risks associated with data rights. These might take the form of much more specific risks for known critical interfaces or additional general risks, such as risks arising from an enterprise-based approach, where data rights issues in one element of an enterprise system could affect the entire enterprise.

Note: This report, by design, only addresses business and contracting risks related to software that drive data rights considerations. Other software risks, such as financial, user base stability, and information assurance, if relevant, can be addressed by other means. In addition, even the risks explained in this report would need to be more precisely defined in terms of possible outcomes and consequences if to be used for risk quantification during program execution.

3.4 Lessons Learned

These risk statements succeeded in explaining the risks involved in the data rights issues to upper level management. They were at about the right level of detail to get the message across. For top-level summary presentations, these were summarized as risk in four areas: development, interoperability, maintenance, and deployment.

4 Data Rights Definition Development

Note: For the final recommended wording, see Section 4.2.

4.1 TMOS Experience

After the risk statements were developed, the next step was to determine which types of data needed more than restricted rights. It was clear that it would be impossible get unlimited rights or even the standard DFAR government purpose rights while still encouraging the use of commercially developed, non-COTS software products. The use of commercially developed products had been encouraged to reduce cost and increase technical maturity, but the data rights issues had not yet been addressed. The goal was to find a way to pay a fair value for the needed rights that would allow the DoD to have the development oversight, maintenance options, and information needed to ensure compatibility while protecting the commercial "crown jewels" of the offerors.

The approach the TMOS team took was to define specific data sets and specific sets of users. The offerors were then asked to include in their proposals the costs to provide specific data rights to these users. For the TMOS case, there were seven different data sets and six sets of users.

4.1.1 TMOS Data Sets

4.1.1.1 Source Code Viewing Only

This data set provides the ability for personnel to review all source code (see Section 4.1.1.4, Source Code Delivery, for what should be made available) associated with a product. The developer will likely oversee this activity. This data set is recommended for all critical software and for all modified software.

Note: The identification of "critical software" is necessarily subjective and case specific. The program will need to define what is meant by critical software.

4.1.1.2 Architecture-Level Design Information

Architecture-level design information will be used to convey top level information regarding a specific software product and includes (with updates as needed)

- software architecture information
    - views showing all executable processes, where they execute at runtime, and how they interact
    - hierarchical view of all software modules ("calling tree")
- overall design concept
- decomposition and functional descriptions of the major components, to include the language used
- details of **all** external interfaces (timing information, data specs, boundary conditions, performance constraints, protocols, messages, and so forth), including the data dictionary for all data available at the external interfaces

- overview of error/exception handling strategy
- top-level information on database/data file structure(s)/schema
- information on any hardware/other software needed to run the application

This data set is recommended for any projects where the software in question has to interface to software products being developed by a different contractor or under a different contract. It is also recommended if the software interfaces with other internal software products if the development contractor will not maintain the system over its lifetime.

4.1.1.3 Additional Design Information

Additional design information will be used to allow more detailed inspection of the software product and to allow greater understanding of the structure and functionality for maintenance and interoperability needs. This information includes (with updates as needed)

- requirements the software was written to meet
- SW architecture views below the module level
- description of the lowest level software units and a description of their functionality
- internal interface information (timing information, protocols, data specs, etc.)
- database/data file internal structure and description
- as applicable, built-in security features and/or built-in safety features
- user interface data—screen architecture, sequencing, data fields, and the like
- performance data under various loading conditions—speed, memory, and CPU utilization, reliability data
- design information on any firmware used in the system

This data set is recommended for any projects where the software in question has to interface to software products being developed by a different contractor or under a different contract. This data set is also recommended if the system is being developed using a block approach or is expected to have upgrades done over the life of the system. It is also recommended if the software interfaces with other internal software products if the development contractor will not maintain the system over its lifetime.

4.1.1.4 Source Code Delivery

Source code delivery is mainly needed for maintenance competition purposes and includes (with updates as needed)

- source code, libraries, databases, internal data files, and build information
- detailed information on COTS products needed to use the source code (preprocessors, interpreters, etc.)
- all software development folders
- other information needed to understand and execute the source code
- configuration information, scripts, and the like
- compilation and build procedures
- algorithms, parameters, and equations used to produce the delivered code

This data set is recommended for projects where the development contractor is not expected to be the maintainer over the life of the system.

4.1.1.5 Development Environment Information

Development environment information is used mainly for maintenance competition and includes (with updates as needed)

- detailed description of all COTS hardware and software used to develop the code

- delivery of all proprietary development tools and databases

- information on how to configure, run, and maintain the development environment

This data set is recommended for projects where the development contractor is not expected to be the maintainer over the life of the system.

4.1.1.6 Test Information

Test information includes (with updates as needed)

- all scripts, stubs, parameters, algorithms, and similar information used for testing at all levels (that is, from module testing through full integration and requirements verification for testing the baseline code and any changes made for this program)

- all proprietary software and hardware required for testing

- test plans and procedures, to include regression testing

- expected test results

- detailed information on COTS hardware and additional software required for testing (automated test tools, etc.)

This data set is recommended for projects where the development contractor is not expected to be the maintainer over the life of the system.

4.1.1.7 Unlimited Licensing

Unlimited licensing is used to ensure that increased licenses costs do not cause funding issues later in the program. Unlimited licensing includes the right to run the code in as many locations and installations as needed.

This data set is recommended if there is a chance that the system may expand to require more software licenses after the initial development is completed.

4.1.2　TMOS User Groups

4.1.2.1　TMOS Program Office

The TMOS program office consists of all government (military and civilian) personnel assigned to the TMOS program office; all federally funded research and development centers (FFRDC) assigned to the TMOS program office, either full- or part-time; any FFRDC experts, as needed; and all systems engineering and technical assistance (SETA) contractors assigned full-time to the TMOS program office. All personnel will sign non-disclosure agreements (NDAs).

4.1.2.2　TMOS Contractor Team

The TMOS contractor team includes all contractors, subcontractors and personnel from other corporate divisions who are working on the TMOS contract. Data can be made available on an as-needed basis.

This "user" set was included to ensure that the offeror's teammates would have adequate access to proprietary software owned by another teammate.

4.1.2.3　TSAT Contractors

TSAT contractors include the system engineering and integration (SE&I), Space Segment, terminal segment and global information grid (GIG) contractors. All personnel will sign an NDA. Information will be released to these users on an as needed basis as determined by the TMOS program office.

4.1.2.4　Other DoD Contractors

Other DoD contractors include

(1) DoD contractors from other programs that may have to interface to TSAT (Future Combat Systems, Joint Tactical Radio System, etc.)

(2) DoD contractors that are bidding on or executing programs that need to be backward compatible with or interface to TSAT

In both cases, the information released will be on an as-needed basis as determined by the government. All personnel will sign NDAs. Personnel in the government program office related to these programs will have access to the same data as their contractors have.

4.1.2.5　Air Force Depot

Air Force depot personnel include all government and contractor personnel working for the Air Force depot where the software will be maintained (currently Hill Air Force Base). All personnel will sign NDAs.

4.1.2.6　DoD Contractors for Maintenance Competition

DoD contractors for maintenance include any DoD contractors that are working on or bidding on maintenance contracts for TMOS software, solely for the purpose of providing maintenance. All personnel will sign NDAs.

For TMOS, the offerors were told that competition for the maintenance for TMOS proprietary software would only be used under specific, negotiated conditions of maintenance non-performance by the developing contractor (for example, failure to meet response time or correct defects).

4.2 Space Segment Experience:

The Space Segment used very similar data sets and user groups, with the names modified to reflect Space versus TMOS. The data set and user group definitions were updated with improvements from TMOS lessons learned and on slightly different concerns for the Space Segment. The updated definitions are provided below.

4.2.1.1 Source Code Viewing Only

Provides the ability for any personnel (within the groups defined below) to review all source code (see Section 4.2.1.4, Source Code Delivery, for what should be made available) associated with a product at a government-selected facility. The developer may be present during this activity.

4.2.1.2 Architecture-Level Design Information

Architecture-level design information will be used to convey top-level information regarding a specific software product; it includes (with all updates) the following:

- software architecture information
    - views showing all executable processes, where they execute at runtime, and how they interact
    - hierarchical view of all software modules ("calling tree")
- overall design concept
- decomposition and functional descriptions of the major components, to include the language used
- details of all external interfaces (timing information, data specs, boundary conditions, performance constraints, protocols, messages, and the like) including the data dictionary for all data available at the external interfaces
- overview of error and exception handling strategy
- top-level information on database and data file structure(s) and schema
- information on any hardware and other software needed to run the application

4.2.1.3 Additional Design Information

Additional design information will be used to allow more-detailed inspection of the software product and to allow greater understanding of the structure and functionality for maintenance and interoperability needs. This information includes (with all updates) the following:

- requirements for which the software was written to meet
- software architecture views below the module level
- description of the lowest-level software units and a description of their functionality
- internal interface information (timing information, protocols, data specs, etc.)

- database and data file internal structure and description

- as applicable, built-in security features and/or built-in safety features

- user interface data—screen architecture, sequencing, data fields, etc.

- performance data under various loading conditions—speed, memory, and CPU utilization, reliability data

4.2.1.4 Source Code Delivery

Source code delivery includes (with all updates) the following:

- source code, libraries, databases, internal data files, and build information

- detailed information on COTS products needed to use the source code (preprocessors, interpreters, etc.)

- all software development folders

- other information needed to understand and execute the source code

- configuration information, scripts, and the like

- compilation and build procedures

- algorithms, parameters, and equations used to produce the delivered code

4.2.1.5 Unlimited Licensing

Unlimited licensing includes the following:

- the right to run the code in as many locations and installations as needed in the course of executing this contract, including training, testing, additional satellites and/or ground site options; if unlimited licensing is not available, state the terms under which you (the contractor) are willing to provide a long-term (20 years following end of current contract period) stable price for purchasing up to twice the number of licenses as proposed for the current contract

4.2.1.6 Development Environment Information

Development environment information includes (with all updates) the following:

- detailed description of all COTS hardware and software used to develop the code

- delivery of all proprietary development tools and databases

- information on how to configure, run, and maintain the development environment

4.2.1.7 Test Information

Test information includes (with all updates) the following:

- all scripts, stubs, parameters, algorithms, and similar information used for testing at all levels (that is, from module testing through full integration and requirements verification for testing the baseline code, and any changes made for this program)

- all proprietary software and hardware required for testing

- test plans and procedures, to include regression testing

- expected test results

- detailed information on COTS hardware and additional software required for testing (automated test tools, etc.)

4.2.2 TSAT Space Segment User Groups

4.2.2.1 TSAT Space Segment Program Office

The TSAT Space program office (SPO) consists of all government (military and civilian) personnel assigned to the TSAT Space SPO; all FFRDCs assigned to the Space SPO either full- or part time; any FFRDC experts, as needed; any SETA contractors assigned to the program office full- or part-time. All non-government personnel shall sign NDAs (government personnel are covered by the Trade Secrets Act).

4.2.2.2 TSAT Space Segment Contractor Team

The TSAT Space contractor team is made up of all contractors, subcontractors, and personnel from other corporate divisions who are working on the TSAT space contract. Data can be made available on an as-needed basis.

4.2.2.3 TSAT Contractors

TSAT contractors include SE&I, TMOS, and terminal program office contractors. All non-government personnel will sign an NDA. This shall be on an as-needed basis as determined by the TSAT Space SPO. Personnel in the government program office related to these programs will have access to the same data as their contractors have. For the purposes of this definition, the government program office is defined in the same manner as the TSAT space SPO.

4.2.2.4 Other DoD Contractors

Other DoD contractors include

(1) DoD contractors from other programs that may have to interface to TSAT (Future Combat Systems, Joint Tactical Radio System, Defense Information Systems Agency, and the like)

(2) DoD contractors that are bidding on or executing programs that need to be backward compatible with or interface to TSAT

In both cases, information will be released as needed, as determined by the government. All non-government personnel shall sign NDAs. Personnel in the government program office related to these programs will have access to the same data as their contractors have. For the purposes of this definition, the government program office is defined in the same manner as the TSAT Space SPO.

4.2.2.5 Air Force Depot

The Air Force depot includes all government and contractor personnel working for the Air Force depot where the software will be maintained (currently Hill Air Force Base). All non-government personnel shall sign NDAs.

4.2.2.6   DoD Maintenance Contractors

DoD maintenance contractors include any DoD contractors working on or bidding on maintenance contracts for TSAT Space Segment software, solely for the purpose of providing maintenance. All non-government personnel shall sign NDAs.

Note: Competition for the maintenance for TSAT Space Segment software would be used only under specific, negotiated conditions of non-performance for maintenance by the developing contractor (for example, response time, defects, etc.).

4.3 Sample Data Set Format

The following format was developed to help explain these data sets. This format is used in Section 5. The data sets are shown down the left hand side, different options are shown across the top and these are grouped by users as shown on the right.

Table 1:   Sample Data Set Format

	Opt 1	Opt 2	Opt 3	
Architectural Level Design	X	X	X	
Additional Design Info	X	X		
Source Code	X	X		
Development Environment	X			TMOS PO
Test Info	X			
Architectural Level Design	X	X	X	
Additional Design Info	X	X		
Source Code	X			
Development Environment				TMOS Contractors
Test Info				
Architectural Level Design	X	X		
Additional Design Info	X			
Source Code	X			
Development Environment				TSAT Contractors
Test Info				

4.4 General Guidance

4.4.1   Data Sets

There may be other specific data that a program needs, for example, field-programmable gate array or firmware data. In addition, there may be specific test sets that might need to be specifically included in a data set. These may be collapsed into smaller groupings, but ensure consideration is given to what data is needed to reduce the risks in all the areas identified in Section 2.

4.4.2 User Groups

Other programs will have different data sets, but the TMOS and Space Segment data sets can be generalized into a fairly standard set. This standard set would always include the government program office in charge of the acquisition. It should also include the contractor team developing the system unless all the software is being developed by the prime contractor. Even if it appears this may be the case when the RFP is being prepared, it is worthwhile to include a clause related to a contractor team in the data rights language in case subcontractors do develop software during the life of the program. If the system being developed has to interface to specific systems, then the contractors maintaining or developing those systems should also be included. The maintenance needs for the system must also be considered. Even if the acquisition strategy calls for contractor logistics support, it is worthwhile to include the government depot at a minimum.

4.5 Lessons Learned

Ensure all the risks identified have been considered and assess future needs as well as current needs. Request personnel outside the program review the data sets and the user sets. The authors also encourage a legal review of the terms. If possible, the conditions for release of data rights during maintenance should be discussed with all interested offerors prior to final RFP release , for example, during industry days so that better definitions of release conditions can be included in the RFP.

5 TMOS Data Rights Options

5.1 TMOS Experience

After determining the risks involved with data rights and defining the data sets and user groups, the TMOS team developed tables to help visualize the available options. One table was developed for each risk area—development, sustainment, interoperability, and deployment. The tables show the various options that might be available.

5.1.1 Development Data Options

The development data options involved data rights needed by the TMOS program office, the TMOS contractor team and the other TSAT contractors. It involved the data sets for architectural level information, additional design information, source code delivery, the development environment, and test information. The development data options assumed that the TMOS program office and the TMOS contractor team would have view-only rights to the source code. Table 1 shows the options considered for the deployment area. For example, in Option 5 the TMOS program office would have rights to the architectural-level design information, the additional design information, the development environment information, and the test information. The TMOS contractor team would have access to the architectural and other design information, and the other TSAT contractors would also have access to the architectural and other design information.

Table 2: TMOS Development Data Options

	Opt 1	Opt 2	Opt 3	Opt 4	Opt 5	Opt 6	Opt 7	
Architectural Level Design	■	■	■	■	■	■	■	**TMOS PO**
Additional Design Info			■	■	■	■	■	
Source Code								
Development Environment					■	■	■	
Test Info					■	■	■	
Architectural Level Design	■	■	■	■	■	■	■	**TMOS Contractors**
Additional Design Info	■	■	■	■	■	■	■	
Source Code						■	■	
Development Environment						■	■	
Test Info						■	■	
Architectural Level Design		■	■	■	■	■	■	**TSAT Contractors**
Additional Design Info				■	■	■	■	
Source Code							■	
Development Environment								
Test Info								

5.1.2 Sustainment Data Options

The sustainment data options involve data rights needed by the depot and by DoD contractors bidding to maintain the system. Table 2 shows the options considered for the sustainment area. For example, in Option 2 both the depot and DoD maintenance contractors would have access to all the data sets.

Table 3: Sustainment Data Options

	Opt 1	Opt 2	
Architectural Level Design	■	■	**AF Depot**
Additional Design Info	■	■	
Source Code	■	■	
Development Environment	■	■	
Test Info	■	■	
Architectural Level Design		■	**DoD Maintenance Contractors**
Additional Design Info		■	
Source Code		■	
Development Environment		■	
Test Info		■	

5.1.3 Interoperability Data Options

The interoperability data options involve data rights needed by the TMOS program office and other DoD contractors working on other programs that need to interface with TSAT, either now or

in the future. Table 3 shows the options for these data sets. As can be seen from Table 3, other DoD contractors would never have access to proprietary data on the development environment or test information.

Table 4: Interoperability Data Options

	Opt 1	Opt 2	Opt 3	Other DoD Contractors
Architectural Level Design	▓	▓	▓	
Additional Design Info		▓	▓	
Source Code			▓	
Development Environment				
Test Info				

5.1.4 Deployment Data Options

The deployment data options involve licensing rights. A similar result could be achieved using an enterprise licensing approach, but the TMOS team decided to consider unlimited licensing options. There were only two options for unlimited licensing: either provide licenses for the TMOS program office, for operational locations, and for maintenance use, or to not provide unlimited licensing at all.

5.2 Space Segment Experience

The TSAT Space Segment started with the TMOS guidance, but made some changes to (1) ensure the appropriate data rights covered software on the satellite, (2) correct some omissions on the TMOS acquisition, and (3) streamline the acquisition processes. Specifically, Space added a specific contract clause to ensure all satellite-borne software would have source code viewing rights for mission assurance purposes, including unmodified COTS products. They also were direct in stating the rights desired, but allowed for different proposals with acceptable risk mitigation. Tables 1-4 also apply to the Space Segment experience.

The Space Segment also added an attachment that asked some very specific questions regarding the COTS/GOTS/reuse software to help determine where data rights might be needed. This attachment had several tables, as explained below.

(1) The first table asked for a listing of all the COTS software that would be used. The offeror was asked to supply the following information:
  a. the name of the COTS component
  b. a short description (to include the approximate number of units sold if under 100)
  c. the software item (SI) or items where the product would be used
  d. if modifications would be made (Yes/No) Note: "modification" was defined as: "Modifications" pertains to those that are made specifically for the TSAT program. Include those modifications of a type customarily available in the commercial marketplace; or minor modifications made to meet Federal Government requirements that do not significantly alter the non-governmental function or essential physical characteristics of an item or component, or change the purpose of a process.
  e. the approximate percentage of requirements satisfied by the COTS product for each SI

(2) For all COTS products with a "Yes" for modifications, the next table asked for the following information:

    a.   name of the COTS component

    b.   who will modify product (original vendor; TSAT Space contractor; other vendor)

    c.   the approximate percentage of the code that will be changed

    d.   approximate source lines of code (SLOC) that will be added

    e.   approximate SLOC count for the COTS product

In addition, the offerors were asked to

- define the government rights they would assert for the changed portion of the COTS component and to provide the basis for their assertion
- define the government rights they would assert on the additional information regarding the interfaces between the changed portion of the code and the pre-existing COTS component and provide the basis for their assertion
- explain in detail the plan for providing continuing maintenance for the modified commercial component containing the changed code
- explain the licensing options for the modified commercial component containing the changed code

(3) The next table asked for information on all non-commercial reused software, firmware, and database components to be used on the program to which the government did not have unlimited or government purpose rights. This table asked for the following information:

    a.   the name of the reuse component

    b.   a brief description of the reuse component

    c.   the SI(s) where used

    d.   the data rights that would be provided to the government

    e.   the approximate percentage of requirements satisfied for that SI

    f.   the SLOC count for the reused code

    g.   the percentage of reused code in that SI

(4) The next table asked for information on all the COTS and reuse products with other than unlimited or government purpose rights. This table, which formed the basis for sustainment data rights, asked for the following information:

    a.   the COTS or reuse component name

    b.   a brief description

    c.   the basis for assertion of less than government purpose rights

    d.   the option price to provide special government rights for sustainment

(5) The next table asked about all COTS and reuse software, firmware, and database components that require a renewable license. It formed the basis for the unlimited licensing data rights and requested the following information:

    a.   the component name

    b.   a brief description

    c.   the SI(s) where used

    d.   the license terms (single user, enterprise, etc.)

    e.   the renewal period

    f.   the price for current contract period

    g.   the option price for unlimited licensing

       Note: If unlimited licensing was not available, the team asked the offeror to state the terms under which it would be willing to provide a long-term (20 years following the end of the current contract period) stable price for purchasing up to twice the amount of licenses as proposed for the current contract.

The Space Segment determined that the TMOS risks applied to the Space Segment and started with the final TMOS options. The Space Segment requested either the government-required data rights or alternatives. If alternatives were proposed, they were required to include risk mitigation plans to show that the risk of not providing the requested rights could be successfully mitigated.

5.3 General Guidance

There are many possibilities for data rights options. Choose enough options to ensure decision makers have viable choices to ensure data rights can be priced within contract constraints. Also, select a presentation style that suits the audience and the options being presented. A bulleted list may be sufficient for some needs; others will need tables like those presented above.

5.4 Lessons Learned

Although the formats used in Tables 1-4 can be difficult to explain to an audience unfamiliar with matrix approach discussed in this paper, the authors' experience was that they provided the most effective presentation of the information.

One other possible format is shown in Table 5, for the deployment options.

Table 5:   Alternate Deployment Data Options View

	Opt 1	Opt 2	Opt 3	Opt 4	Opt 5	Opt 6	Opt 7
Architectural Level Design	A	A	A	A	A	A	A
	B	B	B	B	B	B	B
		C	C	C	C	C	C
Additional Design Info			A	A	A	A	A
	B	B	B	B	B	B	B
				C	C	C	C
Source Code				A	A	A	A
				B	B	B	B
							C
Development Environment							
					B	B	B
Test Information					A	A	A
					B	B	B

TMOS PO (A)

TMOS Contractors (B)

TSAT Contractors (C)

It may be best to combine all the risk areas into combined option sets from the beginning. We did not do this for the TMOS options, but if we had, it would have been similar to Table 6.

Table 6:   Combined Options View

	Opt 1	Opt 2	Opt 3	Opt 4	Opt 5	Opt 6	Opt 7	
Architectural Level Design	X	X	X	X	X	X	X	**TMOS PO**
Additional Design Info			X	X	X	X	X	
Source Code								
Development Environment					X	X	X	
Test Info					X	X	X	
Architectural Level Design	X	X	X	X	X	X	X	**TMOS Contractors**
Additional Design Info	X	X	X	X	X	X	X	
Source Code						X	X	
Development Environment						X	X	
Test Info						X	X	
Architectural Level Design		X	X	X	X	X	X	**TSAT Contractors**
Additional Design Info				X	X	X	X	
Source Code							X	
Development Environment								
Test Info								
Architectural Level Design		X	X	X	X	X	X	**Other DoD Contractors**
Additional Design Info						X	X	
Source Code							X	
Development Environment								
Test Info								
Architectural Level Design	X	X	X	X	X	X	X	**AF Depot**
Additional Design Info	X	X	X	X	X	X	X	
Source Code	X	X	X	X	X	X	X	
Development Environment	X	X	X	X	X	X	X	
Test Info	X	X	X	X	X	X	X	
Architectural Level Design						X	X	**DoD Maintenance Contractors**
Additional Design Info						X	X	
Source Code						X	X	
Development Environment						X	X	
Test Info						X	X	

6 Other Data Rights-Related Issues

There are other data rights related issues that might impact other programs. These include the use of non-modified, standard commercial off-the-shelf (COTS) software (such as a word processing program), the use of government off-the-shelf (GOTS) software, the use of free and open source software (FOSS), and the use of software written in a foreign country (either COTS, GOTS, FOSS, or newly developed code).

6.1 TMOS Experience

TMOS did not specifically address any issues related to COTS, GOTS, FOSS, or foreign software during the source selection. The program is working through issues related to FOSS.

6.2 Space Segment Experience

The Space Segment did address one aspect of COTS licenses. For non-modified COTS that was not used for software resident on the satellite, the offerors were asked to show that the licenses were in not in conflict with any FAR provisions. There were no specific issues related to GOTS, FOSS, or foreign software.

6.3 General Guidance

The issues surrounding non-modified commercial off-the-shelf (COTS), government off-the-shelf (GOTS) and open source software (OSS) are slightly different than the data issues discussed above.

6.3.1 Non-Modified COTS

For non-modified COTS that isn't used in a safety-critical or flight-critical environment, the main concern is most likely related to the standard license. Many standard COTS licenses have terms and conditions conflict with FAR. The government needs to ensure that the prime contractor understands that it will need to negotiate a license that is most likely different from the standard commercial license for that product. In some instances, if a COTS product is on the General Services Administration list, the license may have already been modified.

There are many other issues related to the use and maintenance of COTS software, but only data rights-related issues are captured in this report.

6.3.2 Government Off-The-Shelf (GOTS)

Among the several possible issues related to the use of GOTS software are the following:

- Does the government have existing rights to the software? If not, or if the rights not appropriate, contractors that want to use the GOTS product may be unwilling to do so, fearing a lawsuit. Therefore, government program offices must be sure to get documentation of data rights for all software used and developed for their programs.

- If the prime contractor for the program using the GOTS modifies the software using private funding (such as independent research and development funds), then the prime contractor may consider the final product to be proprietary. The data rights for these types of modified products should be part of the source selection process if possible. If issues arise during contract execution, program management and contracting personnel need to ensure the data rights decisions are legally documented.

6.3.3   Open Source Software (OSS)

Currently, open source software is allowed in DoD systems, as long as it passes all the certification testing required of COTS, GOTS, and newly developed software. To check for the latest policy on open source software check the DoD Chief Information Office website: http://www.defenselink.mil/cio-nii/

One key issue to check when using OSS is whether changes made for use by the program have to be submitted back to the source of the software. Also, as with COTS, licenses must be checked for issues that are in conflict with FAR.

6.4 Lessons Learned

Try to work out as many licensing and data rights issues as possible during the source selection. The government has the most leverage at this point in the development cycle. Be sure any commercial and OSS licenses do not indemnify the government beyond what is allowed in FAR and ensure the government understands what it will have rights to.

7 GPS Data Rights

7.1 Approach

The GPS program had to deal with data rights issue for both the Operational Control Segment (OCX) and GPS III. It took the approach of asserting GPR or unlimited rights for all deliverables and instructed offerors to identify exceptions together with justifications.

The GPS team identified the data rights for each Contract Data Requirements List (CDRL) item. The RFP included an attachment that listed every CDRL item and a field for the offeror to list the asserted data rights and any cost associated with providing those rights. The government filled in many of these fields in advance. For some CDRL items the government asserted that the rights associated with that CDRL should be available to the U.S. government at no cost (for example, the software transition plan and the software requirements specification).

Some CDRLS, such as the cost-related CDRLs and measurement report CDRL, did not contain technical data or computer software.

In many instances the government asserted unlimited data rights in the RFP attachment, but in some instances it left that field blank, to be supplied by the contractor. In many cases the cost field was also left blank to be supplied by the contractor.

Attention was paid to the difference between technical data and software: Two entries were provided for some of the CDRLs, one for technical data and one for software. This was done for the software product specification, the data accession list, and the CDRL for the modeling and simulation report.

7.2 General Guidance

Depending on a program's concerns regarding rights for commercial software, the GPS example may provide a workable approach. The program should carefully examine the CDRL list to identify any that contain technical data, software, or both—and determine what rights the government should request.

7.3 Lessons Learned

Programs need to ensure it is clear what constitutes software, as opposed to technical data. Items such as test cases, build scripts, development environment information, and the like could be missed if the technical data and software-related data are not well defined.

8   Risk Ratings

This section discusses how the TMOS program developed the data rights options used on that program. It was done using a risk-based approach that is described below. If a program needs specialized data rights, the process may prove helpful in determining them.

8.1   TMOS Experience

After working out the various options as discussed in Section 5.1, the TMOS team next tried to plot these options on a 5x5 risk scale. The "consequence" axis is related to the consequences if the data rights included in that particular option were not provided and the "probability" axis related to the probability of having those unwanted consequences due to not having the needed data rights. The probabilities and impacts were determined based on discussions with a small team of subject matter experts. The final product, based on paragraphs 4.1.1- 4.1.4 can be seen in Figure 1.
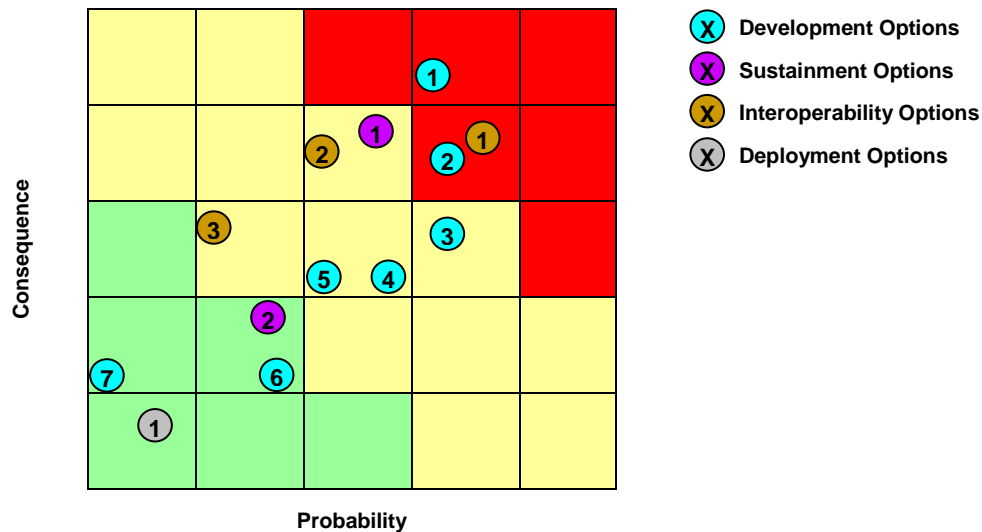

Figure 1:   Data Options Risk Matrix

This matrix was used to help reduce the options. From the risk matrix above and tables in Section 5.1 it can be seen that the risks decrease:

- As more data is provided to the other TMOS contractors and the TSAT contractors (Table 2, Option 7 vs. Option 1)
- As more data is provided to the AF Depot and the maintenance contractors (Table 3. Option 2 vs. Option 1)
- As more data is provided to the other (interfacing or follow-on) DoD contractors (Table 4, Options 3 vs. Option 1)

TMOS selected the two options shown in Table 6 to provide the offerors for costing:

Table 7: TMOS Selected Options

	Development Option	Sustainment Option	Interoperability Option	Deployment Option
Moderate Risk	3	1	2	1
Low Risk	6	2	3	1

These options equate to the following risk options:

Moderate Risk Option

- TMOS SPO
  - Top-Level Design   - Detailed Design

- TMOS Contractor Team
  - Top-Level Design   - Detailed Design

- TSAT Contractors (Space, Terminals, GIG)
  - Top-Level Design

- Air Force Depot
  - Top-Level Design   - Detailed Design
  - Source Code   - Development Environment
  - Test Information   - Unlimited Licenses

- DoD Contractors for Maintenance Competition (under specific conditions)
  - NA

- Other DoD Contractors (other programs, as needed)
  - Top-Level Design

Low Risk Option:

- TMOS SPO
  - Top-Level Design   - Detailed Design
  - Source Code   - Test Information
  - Unlimited Licenses

- TMOS Contractor Team
    - Top-Level Design   - Detailed Design
    - Source Code   - Development Environment
    - Test Information

- TSAT Contractors (Space, Terminals, GIG)
    - Top-Level Design   - Detailed Design

- Air Force Depot
    - Top-Level Design   - Detailed Design
    - Source Code   - Development Environment
    - Test Information   - Unlimited Licenses

- DoD Contractors for Maintenance Competition (under specific conditions)
    - Top-Level Design   - Detailed Design
    - Source Code   - Development Environment
    - Test Information   - Unlimited Licenses

- Other DoD Contractors (other programs, as needed)
    - Top-Level Design   - Detailed Design

8.2 Space Segment Experience

The Space Segment team decided to simplify the data rights and asked for the low-risk TMOS data set. The offerors were asked to bid the cost of that data set. They were provided an alternative, which was to bid something other than the required data set and provide a risk mitigation plan.

8.3 General Guidance

There are many ways to condense the options into manageable sets. A small set of options may just be labeled low, moderate, and high risk without using a risk matrix. Or, start with the most important data sets and users and label the most desired combination as low risk, and work out the remainder of the options from there. It is recommended that the option set be reduced to three options at most. Using one data set, as was done for the Space Segment, can work well and be much easier to explain and evaluate.

8.4 Lessons Learned

The TMOS program presented the entire data set to a very limited audience of decision makers who were very familiar with the issues. It was fairly difficult to explain. The low and moderate data set options were presented to a larger audience, including high-level officers who were involved in program oversight; presenting just these two options was much easier. The larger audience did not ask detailed questions that required explaining the larger data sets.

If the team can decide on one specific set of rights that the government feels are required on the program, then just ask for those specific rights. It is easier to evaluate one option rather than several. The Space Segment team used lessons learned from the TMOS experience and decided to use just the option that was selected on TMOS, since it was sufficient to meet its needs. This also provided continuity across the program and made it easier to explain what Space Segment data rights were being sought. Already having that data set in place for TMOS also helped with the justification of why the data rights were being requested.

9 Contract Clauses

After determining the risk(s) appropriate to the program, the next step is to translate that information into contract clauses. The best time to do this is during the source selection. This should be included in the RFP and can even be used as a selection criterion. If the team is negotiating data rights for a contract that has already been awarded, the same principles apply.

9.1 TMOS Experience

The first step is to determine what to ask for. For TMOS, this was determined by using the risk process and deciding to ask for costs for the low- and medium-risk data sets. The TMOS program decided to ask for separate price information for each data set for both low and medium risk. This resulted in asking for prices for six different data sets. The responses were then evaluated as part of the normal source selection process.

The TMOS contract had two options contract line item numbers (CLINs): one for the delivery of the licensing rights and a second for the data rights. Because TMOS was a software-based development, there were no hardware data rights issues.

9.2 Space Segment Experience

The Space Segment bundled all the data sets together and asked offerors to cost those specific rights or provide an alternative with risk mitigation. The risk mitigation option allowed offerors to propose an alternative if they felt it wasn't feasible to provide the requested data rights. If risk mitigation plans were provided, the government analyzed the risks associated with the mitigation plans very carefully and considered that as part of the overall evaluation. The approach is much easier than others, but may not work in all situations. The Space Segment team also included some very specific language regarding flight software. If a system has any critical software, the program may want to consider special provisions for that software.

The Space Segment team used a combination of an H clause, Section L and M language, a contract attachment regarding data rights, and options CLINs for data rights and licensing delivery. The contract attachment included language to the effect that the data rights were separable from the current contract, non-severable, and would remain in effect throughout the life of the system. The Space Segment team also made sure that any data rights to software provided by a subcontractor were transferable to the government. Ensuring the data rights remain in effect throughout the life of the system is important because most development contracts end before system end-of-life and the government may need to invoke the data rights to ensure the software is properly maintained. Transfer from a subcontractor is also important. Generally, the government has no privity of contract with a subcontractor, but in the case of data rights, those rights would need to be transferred to the government at the end of the contract.

9.3 GPS Experience

The GPS program included an Attachment 6 which listed all the CDRLs with instructions for the offerors to fill in the blank areas. It also used a Section K which contained the information from

DFARS 252.227-7017, Identification and Assertion of Use, Release, or Disclosure Restrictions. Section L of the RFP included the request that Section K identify what, if any, restrictions on the government's rights to use, release or disclose the technical data or computer software would exist for each and every CDRL to be delivered under the contract. Section M included a criterion for the government to evaluate the extent to which the offeror was willing to provide or sell to the government no less than unlimited rights to all technical data labeled as such in column 4 of the table in Attachment 6, and Government Purpose Rights to all remaining technical data and computer software delivered under this contract as indicated in the offeror's completed Attachment 6 and its completed Section K certification.

The instructions for completing Attachment 6 included instructions for how to respond if there were valid reasons why an offeror had to develop entirely at private expense or provide previously developed technical data or computer software under the contract. GPS also include a firm fixed price CLIN for rights in technical data, computer software, and computer software documentation.

9.4 General Guidance

Consider using an H clause if there are circumstances that require special provision such as satellite or safety-critical software. Think about all options when determining the path forward with respect to contract clauses for data rights. The TSAT program used a combination of an H clause, a contract attachment on data rights, and data rights CLINs. GPS used an RFP attachment, a CLIN and a K clause. There are also standard FAR clauses that can be used if they are appropriate for the program. Be sure to start to work with the contract personnel early in the RFP process to ensure the data rights language is correct.

9.5 Lessons Learned

There are three main lessons learned with respect to contract clauses:

(1) Consider all the options, including H clause, contract attachments, standard FAR clauses, and CLINs.
(2) Consider the feasibility of basing the data rights on the CDRL items.
(3) Ensure both the prime and subcontractors are appropriately covered such that the government will have the needed rights until the end-of-life of the program.
(4) Ensure CLINs are included such that the government can "take delivery" of the data rights.

10 Conclusion

Data rights can be a very confusing area for many programs. The government must balance risk to the program with the cost and schedule advantages that may arise from using software from a commercial vendor. There are many factors to consider when determining the data rights needed for a project. Take into consideration the various risks during development, deployment and sustainment as well as licensing risks. Also, consider the most likely sources of software on the project.

If all the software is developed using government funding, then the standard FAR clauses may be sufficient. If there is a mixture of development, modification of commercial software, COTS, GOTS, and OSS, then specialized data rights may be required. The best time to tackle these issues is while writing the RFP. Determine what contract clauses are needed and if data rights will be included in Section L and M as a criteria for award. Finally, ensuring the correct clauses and CLINs are on contract is extremely important. Any changes that might affect data rights that are made during contract execution must include the appropriate changes to the data right contract language.

The investment of time and careful consideration of data rights at the beginning of the RFP processes should pay off with appropriate data rights (and lower government risks) on a program.

11 Useful Sources

This section lists additional references that may be helpful in understanding software data rights issues.

Table 8:   Useful Sources

Name	Author	Description	Link
"Acquiring All That You Need to Maintain Your Software" [ACC]	Art Samora	An article on the acquisition of software and licensing rights from *Defense AT&L* magazine (U.S. Navy)	http://www.dau.mil/pubs/dam/03_04_2005/kan-ma05.pdf
Intellectual Property: Navigating Through Commercial Waters	OUSD (AT&L)	The report discusses issues and solutions for dealing with intellectual property rights. Version 1.1, October 15, 2001.	http://www.acq.osd.mil/dpap/Docs/intelprop.pdf
Army ASA(ALT) Memo: "Data Management and Technical Data Rights"	SAAL-PA	Directs immediate implementation of USD (AT&L) July 19, 2007 memorandum ("Data Management Strategy") on all Army ACAT I and II programs. Application to ACAT III programs is strongly encouraged.	https://acc.dau.mil/CommunityBrowser.aspx?id=206953
GAO Report GAO-06-839; *DoD Should Strengthen Policies for Assessing Technical Data Needs to Support Weapon Systems* (July 2006)	GAO	Although this report does not focus on software, it does address data rights in general.	http://www.gao.gov/cgi-bin/getrpt?GAO-06-839
Public Law 109-364. H.R. 5122/P.L. 109-364, John Warner National Defense Authorization Act for the Financial Year 2007	N/A	Includes Subtitle A—Provisions Relating to Major Defense Acquisition Programs SEC. 802. ADDITIONAL REQUIREMENTS RELATING TO TECHNICAL DATA RIGHTS.	http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_reports&docid=f:hr702.109.pdf DAU Site with data rights language: https://acc.dau.mil/CommunityBrowser.aspx?id=123330&lang=en-US
Data Management and Technical Data Rights Memorandum	USD (AT&L)	USD(ATL) July 2007 memo pertaining to the requirement for ACAT I and II programs to employ data management systems that address the program's assessment of system life-cycle technical data needs	https://acc.dau.mil/GetAttachment.aspx?id=158916&pname=file&aid=29612&lang=en-US

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URL is valid as of the publication date of this document.

[Oberndorf 2000]

Oberndorf, Tricia; Brownsword, Lisa; & Sledge, Carol A. *An Activity Framework for COTS-Based Systems* (CMU/SEI-2000-TR-010). Software Engineering Institute, Carnegie Mellon University, 2000. www.sei.cmu.edu/library/abstracts/reports/00tr010.cfm

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13. ABSTRACT (MAXIMUM 200 WORDS)

The Department of Defense (DoD) is increasingly acquiring complex systems that use commercial software to meet many of the sys-tems' functional requirements. If the commercial software is a truly commercial product and will not be modified (for example, a commer-cial antivirus program), then for most systems, data rights do not become an issue. However, when the commercial software is based on proprietary software that is not available as a standard commercial product or will be modified such that the end product is no longer commercially available or is different from the standard commercial product (for example, a adding program specific capabilities to a da-tabase program), the DoD must consider what data rights are necessary.

This paper

- examines how data rights issues were addressed in the Transformational Satellite Communications System (TSAT) program

- reviews additional concerns posed by the use of commercial software in the TSAT program's Space Segment, including safety and mission assurance, and how those concerns were addressed

- reviews, in less detail, data rights concerns for software incorporated in the Global Positioning System program, and how those con-cerns were addressed

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