INTERNATIONAL STANDARD

ISO 17255

First edition
2014-06-01

Space systems — Programme management — Statement of work

Systèmes spatiaux — Gestion de programme — Déclaration de travail

Reference number
ISO 17255:2014(E)

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Published in Switzerland

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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The committee responsible for this document is ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 14, *Space systems and operations*.

Introduction

This International Standard defines the process and contents of statement of work (SOW) for space systems. The SOW shall define the customer management requirements and activities to satisfy the contract requirements. The SOW is the baseline of business agreement to develop the management requirements of a space system.

This International Standard contributes to the satisfaction of quality and on time delivery of space systems, subsystems and components.

This International Standard provides the significant process and tools to meet the contract management requirements and acts as a supplement to ISO 14300-1.

This International Standard helps to develop a statement of work applicable to all types of space systems, all product elements, and projects.

Space systems — Programme management — Statement of work

1 Scope

This International Standard provides an overview of the purpose and descriptions of statement of work (SOW), its required contents, and process for developing the document.

This International Standard is applicable to all types of space systems, product elements, and projects.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10007, *Quality management systems — Guidelines for configuration management*

ISO 10795, *Space systems — Programme management and quality — Vocabulary*

ISO 14300-1, *Space systems — Programme management — Part 1: Structuring of a project*

ISO 14300-2, *Space systems — Programme management — Part 2: Product assurance*

ISO 16091, *Space systems — Integrated logistic support*

ISO 16192, *Space systems — Experience gained in space projects (Lessons learned) — Principles and guidelines*

ISO 17666, *Space systems — Risk management*

ISO 27026, *Space systems — Programme management — Breakdown of project management structures*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10795 and the following apply.

3.1.1
management requirement
formalized statement in the statement of work made exclusively to describe what to deliver and to specify the work to be performed, excluding the technical performance

3.1.2
mission statement
document expressing the set of collected needs

Note 1 to entry: The mission statement is a document established by the customer, which reflects the users needs, and is used as input to all phases of a space system project.

3.1.3
scope statement
document expressing the project scope, including major deliverables, project assumptions, project constraints and a description of work, that provides a documented basis for making further project decisions and for conforming to or developing a common understanding of project scope among the stakeholders

Note 1 to entry: Project scope refers to the work that must be performed to deliver a product, service, or result with the specified features and functions.

3.1.4
statement of work
SOW
contractual document prepared during project initiation and planning that describes what the project shall deliver and outlines all work required to complete the project

[SOURCE: ISO 10795:2011, definition 1.216]

3.2 Abbreviated terms

The following abbreviated terms are defined and used within this document.

CM	Configuration Management
PA	Product Assurance
ILS	Integrated Logistic Support
SOW	Statement Of Work
WBS	Work Breakdown Structure

4 Statement of work — Purpose and description

A statement of work (SOW) defines what is to be delivered and to be done by the supplier in terms of requirements, not how to accomplish the work by supplier.

The SOW is a valuable tool to capture the work to be done by the supplier for contract management.

The SOW is one of the attachments in the business agreement and is consistent with all sections of the business agreement.

The SOW is the major document in the business agreement which forms the basis for effective management of a project. A SOW serves as the standard for determining if the supplier meets the stated management requirements.

The requirements in the SOW are stated in terms of results needed rather than how to proceed in order to achieve those results.

5 Process for establishing a statement of work

5.1 General

A systematic process for SOW development begins with an analysis of what work is to be performed and the work breakdown into components. It ends with a clear description of output requirements.

The process for establishing the SOW should be implemented during Phase A of the systems engineering life cycle.

5.2 Prerequisite for establishing a statement of work

A team shall be set up as the prerequisite for establishing the SOW. The team should:

a) Use work breakdown structure (WBS) in developing the SOW. The requirements for WBS are defined in ISO 27026.

b) Ensure that only those tasks which add value to the project are included in the SOW.

c) Identify the required documents which properly authorize the project and define its basic objectives.

d) Prepare a bibliography referring to the specific portions of all applicable specifications and standards with which the project must comply.

e) Categorize the work described by WBS into that which will be done by the customer and that which needs to be contracted.

f) Identify all organizations and persons who will participate in preparing the SOW, and determine the participants' areas of responsibility.

g) Identify the work and resources which the customer needs to provide during the process that the supplier accomplishes the work.

h) Prepare the SOW following the requirements of this International Standard.

5.3 Steps for establishing a statement of work

The process for establishing the SOW should comprise 8 steps. Steps 1 to 4 establish a Preliminary SOW which is used for invitation to tender as a part of the Request For Proposal (RFP). Steps 5 to 8 establish a Final SOW which is used for developing as a part of the business agreement. The 8 steps are as follows:

1) Step 1:prepare for establishing SOW;

2) Step 2:structure the management requirements;

3) Step 3: assess the management requirements;

4) Step 4: establish preliminary SOW;

5) Step 5: negotiate the management requirements in preliminary SOW with supplier;

6) Step 6: adjust and complete the management requirements;

7) Step 7: agree on the management requirements;

8) Step 8: issue the final SOW.

The steps for establishing the SOW are summarized in Figure 1.

The outcome of this process is an agreed set of management requirements issued by the customer and to be included in the business agreement for development.

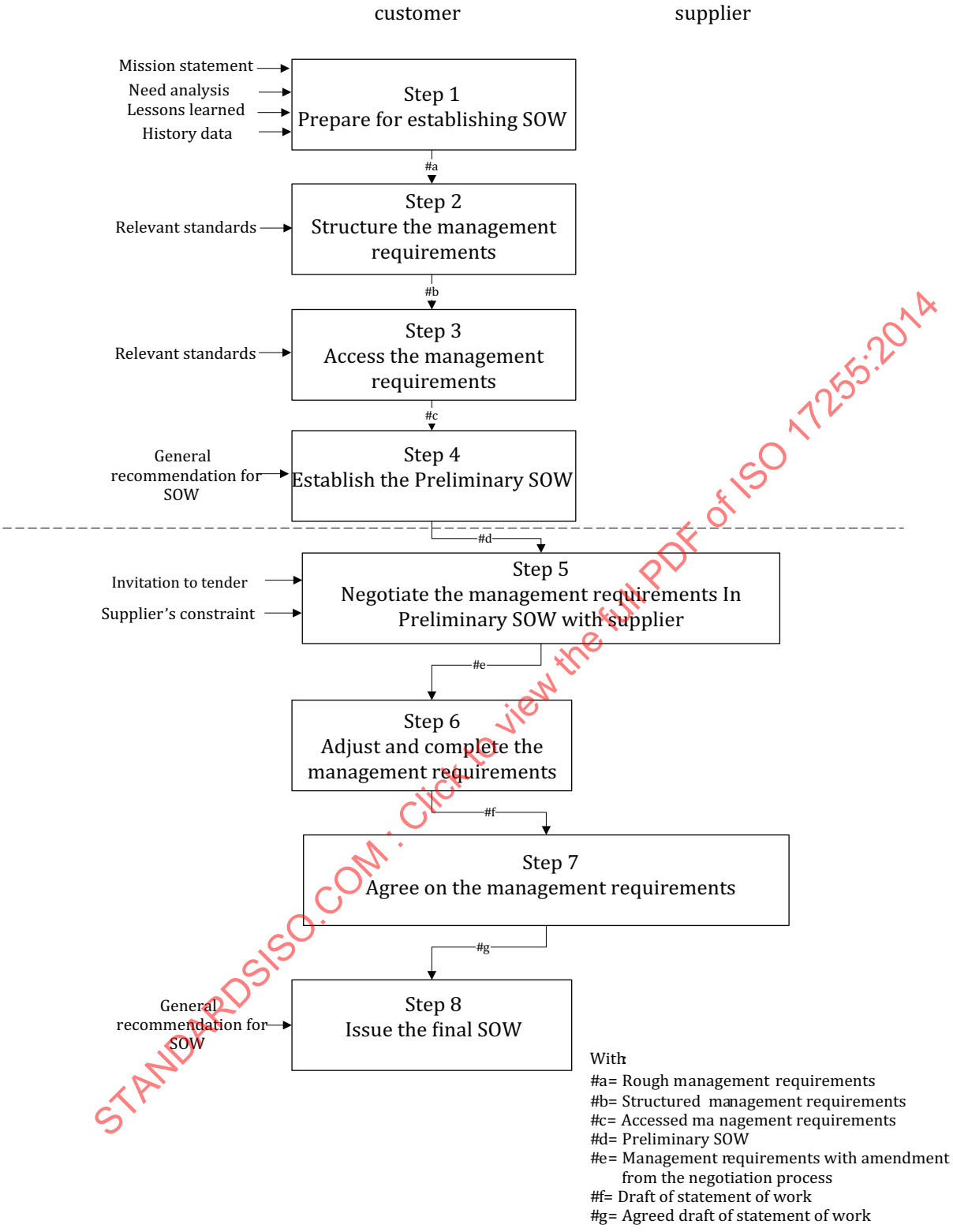

Figure 1 — Steps for establishing a SOW

5.3.1 Prepare for establishing SOW

The following is a summary of the procedural steps for preparing a SOW (see Figure 2):

a) Establish a preliminary scope statement according to the mission statement and need analysis (i.e. the purpose or objective of procurement):

- Identify the objective or purpose of the procurement;
- Describe the work to be performed;
- Define the magnitude of work to be performed;
- Define the boundaries of performance and responsibilities.

b) List the tasks to be performed:

- Group similar and related tasks;
- Categorize tasks as either major or sub-tasks;
- Add any additional task.

NOTE Take care not to overly constrict the methods which the supplier must use to perform the work.

c) Organize the tasks in logical sequence:

- Chronological order, time-phase, discipline;
- Ensure that each task required meets each mission requirement;
- Ensure that no unnecessary or repetitive tasks are included.

d) Identify the output (Required results or deliverables):

- Identify required results or deliverables (products, services, meetings, reports);
- Ensure that each output has been verified to meet the requirements.

e) Identify the input:

- Identify the required resources for each task (may be labour, equipment and material, documentation);
- Identify any operating restrictions or procedures.

f) Identify the time limit or frequency of the deliverables referring to lessons learned and historical data.

g) Develop the parameters for acceptable quality referring to lessons learned and historical data:

- Develop a performance standard or acceptance criteria;
- Include elements such as “what”, “when”, “where”, “how many times”.

h) Determine how to monitor the deliverables referring to lessons learned and historical data:

- Appropriate for the contract;
- Ensuring cost effectiveness;
- Methods can include 100 % inspection, random sampling, periodic inspection, review of progress milestones, reports by supplier, complaints.

i) Express all of the above [(from a) to h)] in terms of requirements.

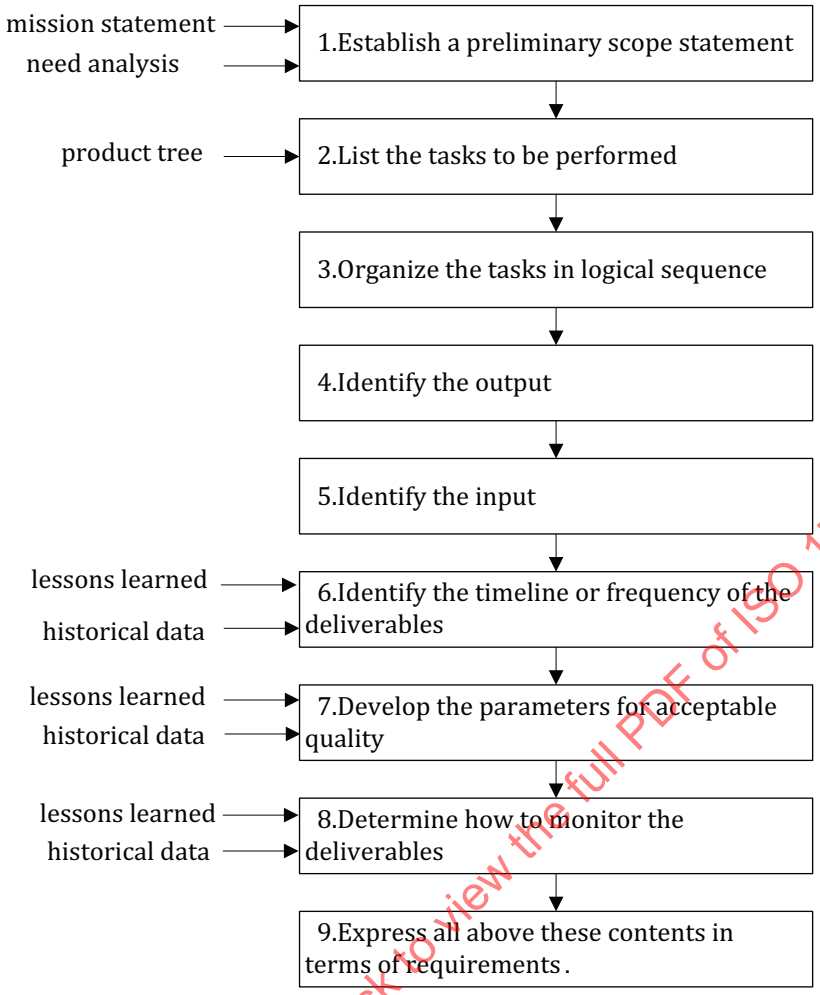

Figure 2 — The process steps for preparing a SOW

5.3.2 Structure the management requirements

The customer structures the individual requirements to form a structured SOW according to the requirements of this International Standard. Write the SOW according to the requirements of Clause 8 to ensure that everyone understands the requirements in the SOW clearly.

5.3.3 Assess the management requirements

The customer assesses the entire set of requirements for correctness, consistency and suitability for the intended use according to the relevant standards.

5.3.4 Establish the preliminary SOW

The customer establishes and releases the preliminary SOW.

5.3.5 Negotiate the management requirements in preliminary SOW with supplier

The customer negotiates with the supplier to establish amendments to the requirements considering environmental constraint, programmatic elements and supplier's constraint. The negotiation step can be implemented by a meeting. The customer and supplier identify the requirements one by one and keep records of amendments.

5.3.6 Adjust and complete the management requirements

The requirements are adjusted and completed according to the result of the negotiation step. The customer prioritizes the requirements according to the records of amendments.

5.3.7 Agree on the management requirements

Both the customer and supplier agree upon the requirements contained in the draft issue of the SOW. The SOW is signed by customer and supplier for identification.

5.3.8 Issue the final SOW

The customer establishes the SOW and releases it.

6 Content of statement of work

6.1 Introduction

The content of statement of work shall include three sections (see Figure 3):

1) Scope: to define the breadth and limitations of the work to be done, customer and supplier responsibilities, and give information about the background of the project, including the project planning and the master schedule.

NOTE In some cases, the information related to the context of the project can be an individual chapter and the use of an introduction, background, or both, is preferred.

2) References: to list all the normative (applicable) documents and standards.

3) Management requirements: to specify deliverables and work tasks to satisfy project needs (described in 6.2 to 6.10).

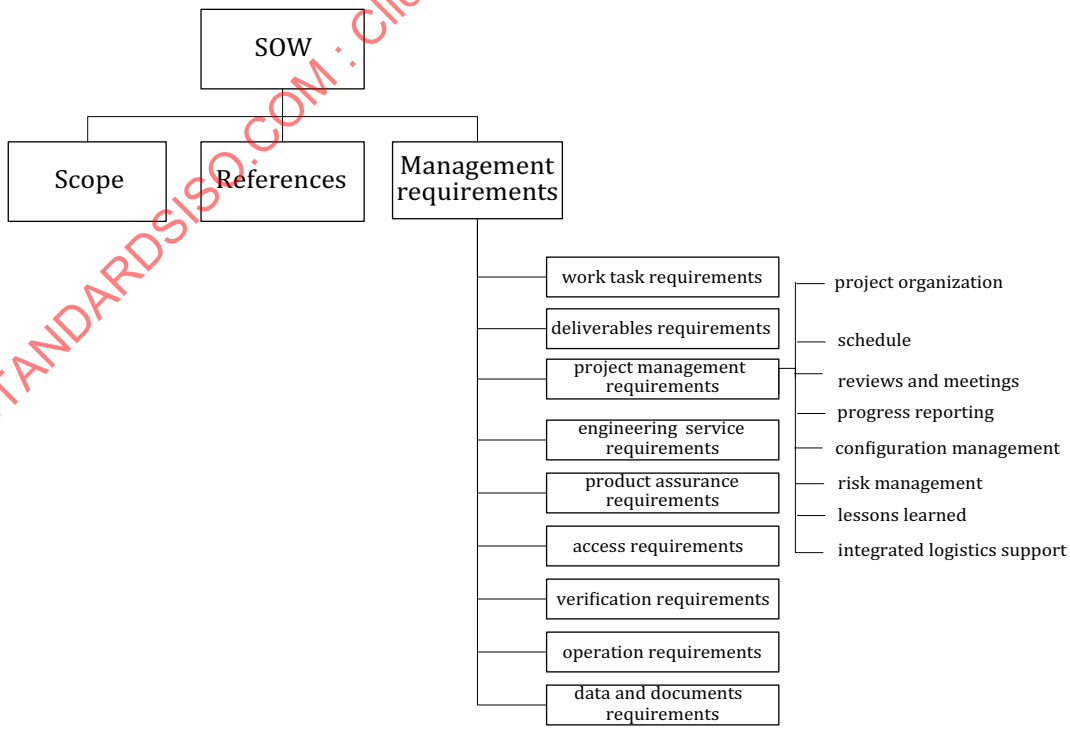

Figure 3 — Content of SOW

The different types of management requirements contained in the SOW are as follows:

a) work task requirements;

b) deliverables requirements;

c) project management requirements;

   1) project organization,

   2) schedule,

   3) reviews and meetings,

   4) progress reporting,

   5) configuration management,

   6) risk management,

   7) lessons learned,

   8) integrated logistics support (ILS),

d) engineering service requirements;

e) product assurance requirements;

f) access requirements;

g) verification requirements;

h) operation requirements;

i) data and document requirements.

An example of contents of statement of work is in Annex A.

6.2 Work task requirements description

The customer shall define the work to be performed in consideration of the deliverable item's reliability, quality, schedule and cost to be satisfied. Each work statement shall describe the purpose, the activities, the input and output.

NOTE The supplier will prepare WBS according to these requirements.

6.3 Deliverables requirements description

Deliverables requirements are statements that define all deliverable items with their quantities and delivery schedule.

NOTE This usually includes hardware (e.g. equipment, parts) and software (e.g. operational software, interface software).

6.4 Project management requirements description

6.4.1 General

Project management requirements relate to relevant responsibilities and activities covered by the project management to ensure the project completion. Project management requirements are defined in ISO 14300-1. Generally, project management requirements in SOW comprise the areas listed as follows.

6.4.2 Project organization

Project organization requirements relate to the project organization that the supplier will establish for the project, including key personnel in the organization, authorities and responsibilities of organization members.

EXAMPLE The supplier shall set up and maintain a project specific organization to conduct the work to be performed during the project. The organizational functions shall fulfil each requirement in SOW. The supplier's project manager shall be the primary point of contact with the customer.

6.4.3 Schedule

Schedule requirements relate to the project schedule to meet the specified completion date and requirements for monitoring and controlling the progress and quality of the work. Project schedule should be based on WBS of the project. Requirements on schedule can be described by milestones.

EXAMPLE The schedule of the project from the Effective Date of Contract (EDC) until the end of Final On-site Acceptance Test and Delivery shall be 30 months. The milestones of the project are described in table.

6.4.4 Reviews and meetings

Reviews and meetings requirements relate to defining the reviews to be conducted and the meetings to be held in the process of the project.

EXAMPLE Reviews can include Readiness Review (RR), Qualification Status Review (QSR), Design Reviews(DR), Qualification Review (QR), Non-Conformance Review (NCR), Material Review Board (MRB), Pre-Shipment Review (PSR). Meetings usually include kick-off meetings, progress meetings, ad hoc meetings.

6.4.5 Progress reporting requirements description

Progress reporting requirements relate to the content and periodicity of reporting the progress.

NOTE Progress reports are usually needed in reporting the progress and are intended to be an executive summary of the past period. For example the progress reports generally include the following:

a) The work that has been finished in the preceding period.

b) The main work that is being carried out or to be carried out in the following period.

c) Problems that are encountered and that need to be solved with the customer's assistance.

d) Schedule status.

e) Product assurance activities.

f) Non-conformance status.

g) Prediction of completion status of deliverable, schedule, and cost.

EXAMPLE The supplier shall prepare and deliver monthly status reports.

6.4.6 Configuration management requirements description

This section deals with the requirements and procedure on configuration management. The requirements are defined in ISO 10007.

NOTE This can include:

a) identification of critical processes;

b) selection of configuration items according to product tree;

c) documentation of configuration baselines;

d) establishment of configuration baselines;

e) configuration status accounting;

f) configuration control;

g) change control;

h) configuration status controlling;

i) configuration audit.

EXAMPLE The supplier shall establish configuration management processes to control hardware, software, processes, and documentation. The supplier shall also implement an engineering control system that shall review and approve changes to design, drawings, documentation, software design, software code, mechanical parts, material lists, test specifications and procedures, once a baseline has been established. Any modification to requirements or deviations shall be in accordance with the Configuration Management Plan.

6.4.7 Risk management requirements description

Risk management requirements relate to organization, resources and activities of risk management. The requirements are defined in ISO 17666.

EXAMPLE From the beginning of the program, the supplier shall implement a Risk Management Process to ensure that development, programmatic, and operational risks are identified, assessed, mitigated and controlled in a systematic and comprehensive manner. The risk management steps shall contain:

—identification of risks;

—ranking and selection of risks based upon the probability / gravity matrix;

—risk analysis and definition of mitigation actions;

—tracking of risks until closure;

—acceptance of residual risks by the appropriate management authority.

6.4.8 Lessons learned requirements description

Lessons learned requirements relate to providing and applying lessons learned. The principles and requirements for lessons learned are in ISO 16192.

6.4.9 Integrated logistics support (ILS) requirements description

ILS requirements relate to the integrated logistics support activities. The requirements for ILS are defined in ISO 16091. This can include:

a) storage requirements;

b) transportation requirements;

c) package requirements;

d) insurance requirements;

e) delivery site requirements;

f) training requirements;

g) office accommodation requirements.

6.5 Engineering service requirements description

Engineering service requirements relate to providing engineering tasks and engineering service requirements.

EXAMPLE The supplier shall provide engineering and technical services throughout the contract for the design, assembly, integration and test, launch and in-orbit test of the spacecraft, as well as for the development and test of related ground control equipment and ground products.

6.6 Product assurance requirements description

Product assurance requirements relate to establishing and implementing a product assurance (PA) program to ensure that space products accomplish their defined mission objectives in a safe, available and reliable way. PA requirements are defined in ISO 14300-2.

This can include the following subjects:

a) PA organization;

b) PA plan;

c) PA reporting;

d) PA audits;

e) PA reviews;

f) risk assessment and critical items control;

g) quality assurance;

h) safety assurance;

i) dependability assurance;

j) parts, material and process;

k) non-conformance control;

l) procurement requirements;

m) product assurance documentation and end item data packages.

EXAMPLE The supplier shall establish and implement a PA program in accordance with the requirements defined in the product assurance requirements. The PA programs shall encompass all the planned and systematic activities to:

1) provide confidence to the management of lower tier supplier (internal PA) that the products will conform to the requirements for quality and dependability.

2) provide confidence to the customer (external PA) that the products will conform to the requirements for quality and dependability.

6.7 Access requirements description

Access requirements relate to the right to access and which activities to participate in during the project development.

EXAMPLE The customer and the end customer representatives shall have the right to participate in all technical reviews and review board meetings relevant to the quality and performance of flight hardware and software provided under the contract.

6.8 Verification requirements description

Verification requirements relate to verification items and verification implementation.

EXAMPLE The supplier shall provide for the design review, the qualification testing, protoflight testing of modified units to demonstrate the performance requirements are met. A verification matrix shall be included in the proposal to define the method of verification for each technical requirement and a traceability matrix shall be provided.

6.9 Operation requirements description

Operation requirements relate to operation services.

EXAMPLE The supplier shall provide the information/documentation necessary to prepare the operations of the equipment. The supplier shall establish and maintain the equipment operations manual and training manual.

6.10 Data and documents requirements description

Data and documents requirements relate to data and documents delivery, including the time and frequency of delivery. Generally, the Contract Data Requirements List (CDRL) is used to control and manage the documents and data to be delivered by the supplier.

7 General requirements for statement of work

7.1 General

a) The SOW shall tell supplier how such results will be measured and how acceptance of the product or service will be defined and accomplished.

b) The tailoring criteria of all standards and specifications cited shall be defined in SOW.

c) The minimum required tasks that can still meet the needs shall be defined in SOW.

d) The SOW shall be subject to contract law.

7.2 Responsibility

a) An entity shall be identified to be responsible for the SOW.

b) The responsible entity shall define access policy and rights, and the distribution list for the SOW.

7.3 Data management

A review of anticipated data requirements should include definition of a time line defined for data submission.

Only the data needed by the customer to make a decision and/or comply with a higher level requirement shall be required. Do not request reports that the customer can generate on its own from supplier delivered data.

A list of all data to be delivered should be prepared, including the time and frequency of delivery. This should include information on the status of the supplier effort, information needed to support, manage, and operate the system, and using supplier formats or those common to the customers, if feasible.

7.4 Integrity

The SOW shall not be unnecessarily restrictive to avoid unfairly excluding one supplier or increasing prospects for award to another.

7.5 Configuration management

The SOW shall be under configuration management.

7.6 Supplementary information

If a (sub)clause is stated to be informative or descriptive, then this (sub)clause shall not contain any requirement or recommendation.

7.7 Restrictions

The SOW shall only include management requirements and exclude requirements such as cost, methods of payment, design control or hardware performance parameters.

8 Requirements for writing the statement of work

Requirements for characteristics of management requirements in the SOW are as follows:

a) Specify requirements clearly to permit the suppliers to determine the levels of expertise, manpower, and other resources needed to accomplish the task.

b) Specify clearly so that there is no question of whether the supplier is obligated to perform specific tasks.

c) Avoid the possibility of misinterpretation; terminology must be consistent. The same words and phrases shall be used when describing the same requirement.

d) Management requirements in the SOW shall be prepared in terms of the results that are desired excluding “how to” requirements.

e) Management requirements in the SOW shall be unambiguous and not in conflict with the other associated requirements in a business agreement.

f) Management requirements in the SOW shall be consistent (e.g. not in conflict with the other requirements within the SOW).

g) Compounded requirements should be avoided.

Recommendations for the wording of requirements are in Annex B.

Annex A
(informative)

Example of contents of statement of work

A.1 Example of contents of statement of work

An example of the contents of a statement of work is as follows:

1 Introduction

1.1 Scope

1.2 Overview

2 Applicable and reference documents

3 Work task requirements

4 Deliverables requirements

4.1 Introduction

4.2 Deliverable hardware and software

4.2.1 Definition of deliverable hardware and software

4.2.2 List of deliverable hardware and software

4.3 List of deliverable documents

4.4 Service to be offered

4.5 Deliverable items from customer

4.5.1 List of deliverable documents

4.5.2 Other

5 Project management requirements

5.1 Introduction

5.2 Project organization

5.3 Requirements for project schedule

5.3 Requirements for reviews and meetings

5.4 Requirements for progress reporting

5.4.1 Master schedule progress reports

5.4.2 Monthly progress reports

5.4.3 Special reports

5.4.4 Mandatory inspection point reports