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# STATEMENTS OF WORK HANDBOOK



National Aeronautics and Space Administration

Washington, D.C. 20546

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## PREFACE

February 1975

This handbook is intended to provide broad policy guidelines for use in the development of statements of work for NASA programs, projects, and contracts.

Program Directors or Directors of Field Installations may wish to issue documents which expand upon the concepts contained in this handbook for work under their cognizance. Users are expected to apply common sense in individual situations, providing that these do not constitute a departure from the basic concepts and intent. Advance approval of substantive variations and adaptations will be secured from the Assistant Administrator for Procurement.

This handbook is available to the public from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.



Associate Administrator for  
Organization and Management

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# TABLE OF CONTENTS

CHAPTER		PAGE
1	PREPARATION OF STATEMENTS OF WORK . . . . .	1
2	STATEMENTS OF WORK FOR STUDY AND PRELIMINARY DEFINITION CONTRACTS . . . . .	11
3	STATEMENTS OF WORK FOR DEFINITION AND DEVELOPMENT OF MAJOR SYSTEMS . . . . .	15
4	STATEMENTS OF WORK FOR SUPPORT SERVICES . . . . .	19
5	STATEMENTS OF WORK FOR SMALL R & D CONTRACTS (\$100,000 OR LESS) . . . . .	31

## CHAPTER 1: PREPARATION OF STATEMENTS OF WORK

### 100 GENERAL

This handbook establishes guidelines to be used in preparing Statements of Work (SOWs) to assure a consistent approach throughout NASA. It is primarily intended for use by NASA personnel in developing Statements of Work to be included in Requests for Proposals (RFPs). Although the handbook is directed chiefly towards major negotiated procurements where Source Evaluation Board (SEB) procedures apply, much information contained herein is applicable in preparing SOWs for smaller procurements. A suggested outline for SOWs for procurements of \$100,000 or less is contained in Chapter 5. It will also be helpful to NASA contractors in preparing SOWs for subcontracts and to offerors in preparing their proposals.

### 101 DESCRIPTION OF THE STATEMENT OF WORK

The SOW is a description of the tasks, products, and/or services to be procured by NASA. It should state as fully, clearly, and precisely as possible what the Government requirement is but at the same time not overspecify. The SOW is an essential part of an RFP. Listed below are *key* elements which should be considered in preparing a SOW but are not intended to be a Table of Contents for a SOW.

1. General Scope of Work (i.e. Objectives and Related Background).
2. Contractor Tasks.
3. Contract End Items (End Item Performance Requirements).
4. References to Related Studies, Documentation, and Specifications.
5. Data Requirements.
6. Support Equipment for Contract End Items.
7. Government Furnished Property, Facilities, Equipment, and Services.
8. Government Furnished Documentation.
9. Appendices to the SOW (Requirements to be Deferred).
10. Exhibits to the SOW (Applicable Documents).
11. Attachments to the SOW (Background Information).
12. Schedules or Period of Performance.

## 102 RELATIONSHIP OF SOW TO NASA ACQUISITION PROCESS

1. Figure 1-1 displays a graphic perspective of the sequence of RFP/SOW preparation in relation to the entire NASA acquisition process. Figure 1-2 shows sequentially the essentials of preparing a contract SOW.
2. For any given procurement the planning necessary for the preparation of the SOW should start as early as practicable and not be deferred because the program or project start has not been authorized.
3. The SOW is part of the RFP and must be compatible. The SOW serves as a basis for contractor response, evaluation of proposals, and source selections.
4. Statements of Work should be prepared by the organization, normally the initiator of the PR, (e.g., program, project, or functional office wherever located). The project or functional manager may select a task team to assist him in preparing the SOW and Work Breakdown Structure (WBS). Early coordination with appropriate procurement personnel is most desirable.

## 103 RELATIONSHIP OF SOW TO CWBS

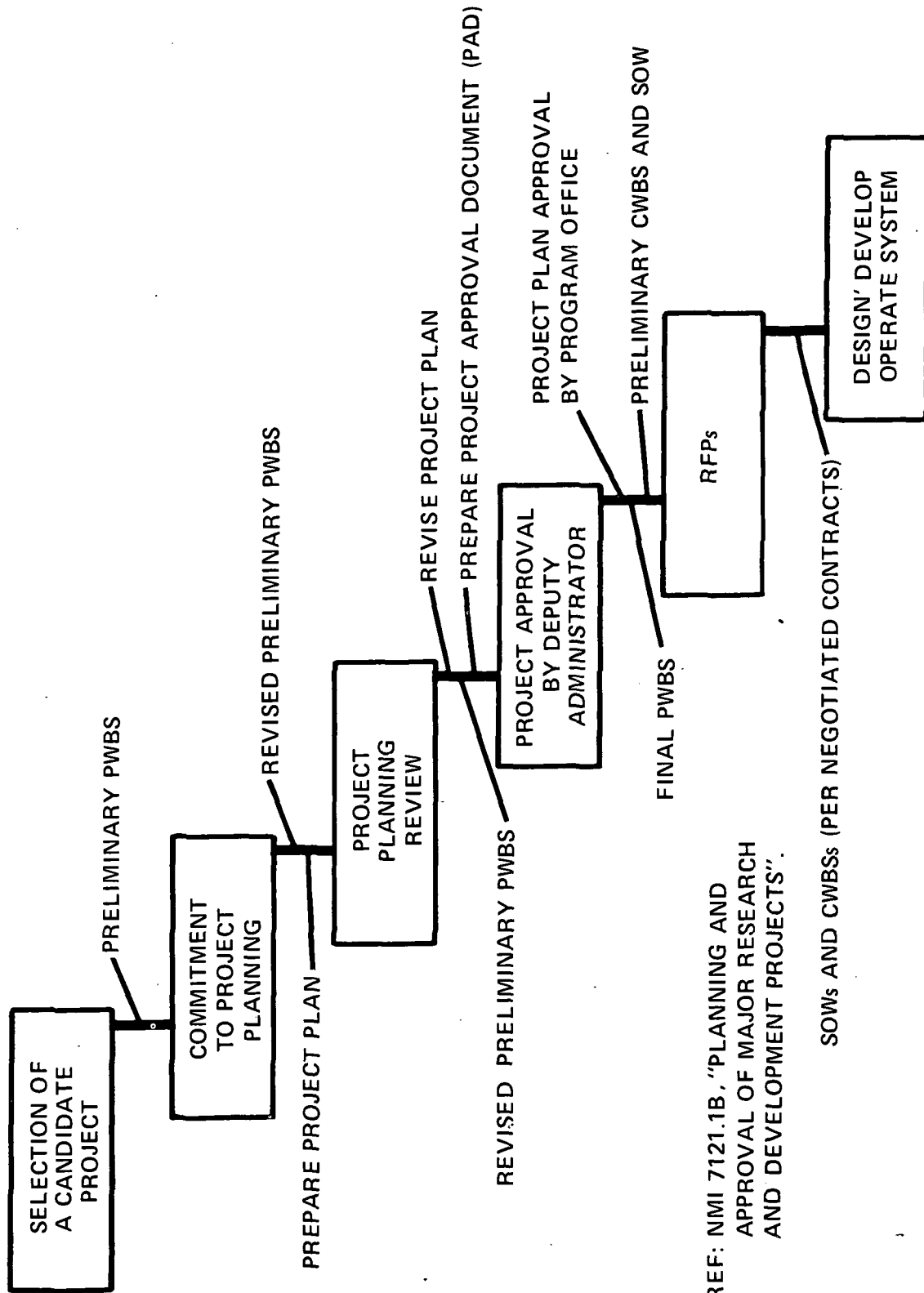
As discussed in NHB 5610.1 "Handbook for Preparation of Work Breakdown Structures," program and project work are tied together by the Project Work Breakdown Structure (PWBS). Normally, the task team should make use of appropriate elements of the Contract Work Breakdown Structure (CWBS) in preparing the proposed SOW. To aid continuity and to avoid confusion, the SOW coding should conform as closely as possible to the numerical coding of the related task elements of the CWBS. The coded task descriptions should clearly define each deliverable end item or product and each task. In practice the CWBS and SOW will usually be developed in parallel; and the SOW and CWBS preparation activities closely coordinated, to assure that there is an identifiable relationship between the CWBS and SOW elements.

## 104 ORGANIZATION OF STATEMENT OF WORK REQUIREMENTS

1. In the interests of simplicity and effectiveness, Statements of Work will consist of the main body and the appendices.
2. The primary product(s) and/or services(s) to be procured and the specific tasks to be performed will be described in the main body of the Statement of Work.
3. When supporting requirements are to be included (e.g., reliability, safety, and configuration management), but are not significant evaluation factors for source selection, these requirements should be described under separate appendices attached to the Statement of Work and incorporated by reference.

A supporting requirement should *not* be separated from the main body of the SOW if such separation, as described above, would seriously detract from NASA's ability to evaluate the proposer's description of the product or service being proposed.

# RELATIONSHIP - NASA ACQUISITION PROCESS (\*) AND WORK BREAKDOWN STRUCTURES



REF: NMI 7121.1B, "PLANNING AND APPROVAL OF MAJOR RESEARCH AND DEVELOPMENT PROJECTS".

SOWs AND CWBSs (PER NEGOTIATED CONTRACTS)

FIGURE 1-1

# SEQUENCE DIAGRAM - SOW PREPARATION

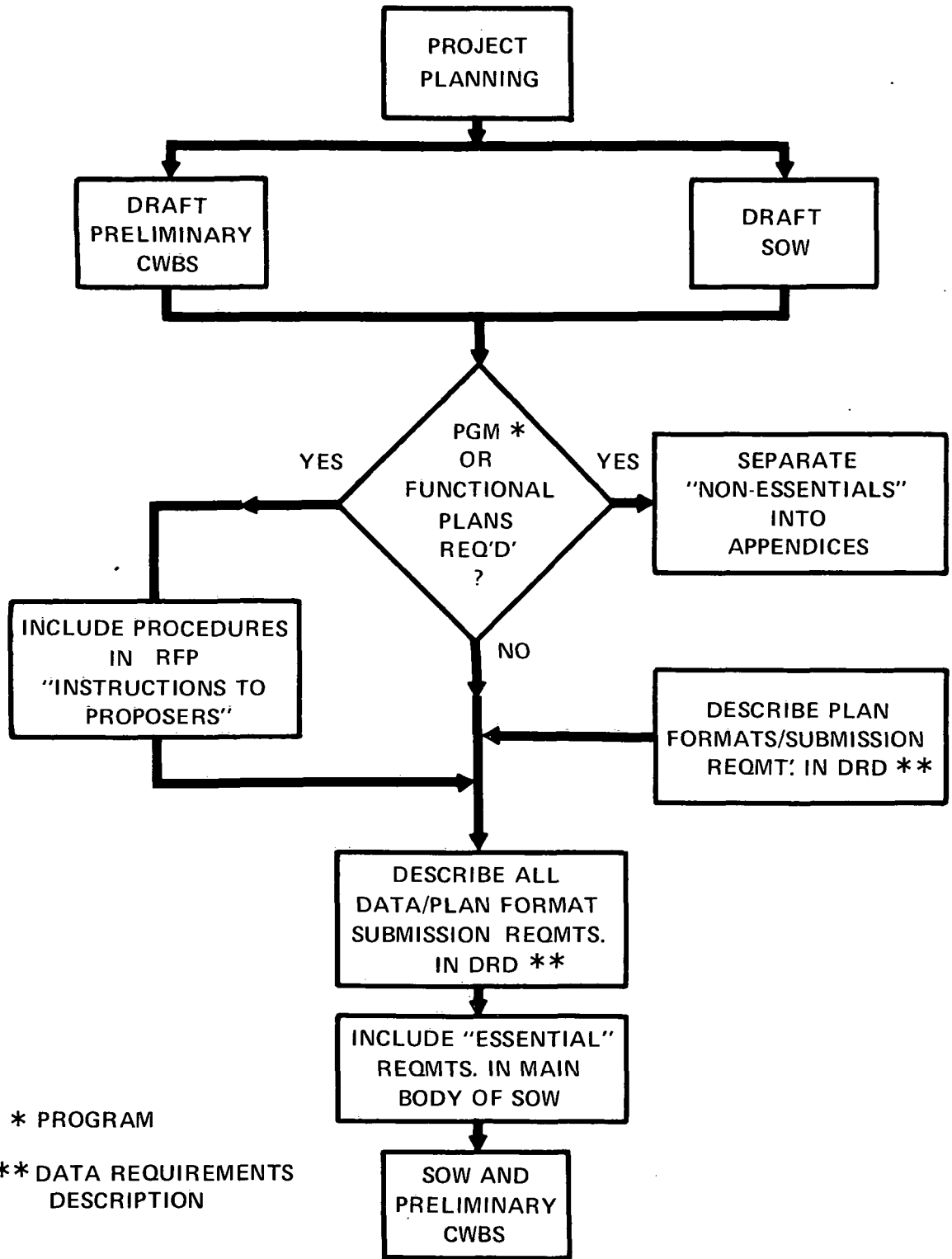


FIGURE 1-2



4. The proposer will be informed in the instruction section of the RFP that he will *not* be required to submit detailed plans in response to the requirements described in the SOW appendices as part of his initial proposal. The proposer *will* be required to submit an estimate of his cost and manpower to perform the work required by each SOW appendix. A summary plan, however, *shall* be submitted in lieu of each detailed plan.
5. Proposers will be required to state that they understand that a detailed plan will be necessary for each requirement, separately described in an appendix if they are selected for negotiations. The winning proposer(s) will be required, by the contracting officer, to submit detailed plans within a specified number of days.
6. Proposers shall be required to specifically state any exceptions which they make take to the SOW.

## 105 SOW PREPARATION STEPS

This section describes a practical approach to be used by project managers, or those offices responsible, to develop SOWs for RFPs.

1. The project manager or his designees should review the documents which authorize the project and define its objectives, and also review contracts and studies leading to the present level of development. As a convenience, a bibliography of related studies should be prepared together with samples of any similar SOWs, and compliance specifications.
2. A copy of the PWBS should be obtained. At this point in time coordination between the CWBS elements and the SOW should commence. Each task element of the preliminary CWBS should be explained in the SOW and related coding should be used.
3. The project manager should establish a SOW preparation team consisting of personnel he deems appropriate from the program or project office who are experts in the technical areas involved, and representatives from procurement, financial management, fabrication, test, logistics, configuration management, operations, safety, reliability and quality assurance, plus any other area which he may consider as able to provide constructive support, or which may be involved in the contemplated procurement.
4. Before the team actually starts preparation of the SOW, the project manager should brief program management as to the structure of the preliminary CWBS and the nature of the contemplated SOW. This briefing is used as a baseline from which to proceed further.
5. The project manager may assign identified tasks to team members by using a task function matrix (see Figure 1-3), and identify compliance specifications, design criteria, and other requirements documentation which must be included in the SOW and assign them to responsible personnel for preparation. Assigned team members will identify and obtain copies of specifications and technical requirements documents, engineering drawings, and results of preliminary and/or related studies which may apply to various elements of the proposed procurement.

## TASK FUNCTION MATRIX

CWBS NO.	DEVELOPMENT	DESIGN	PROTOTYPES	FABRICATION	ASSEMBLY	VERIFICATION	QUALITY	SAFETY	ETC.
1.0 1.1 1.1.1 1.1.1.2  etc.									
<p>NOTE:</p> <p>THIS TYPE OF CHART CAN BE USED IN SEVERAL WAYS:</p> <ol style="list-style-type: none"> <li>1. TO ASSIGN RESPONSIBILITY FOR PREPARATION OF THE SOW SECTIONS BY CWBS NO.</li> <li>2. TO CHECK STATUS OF COMPLETION OF EACH ITEM.</li> <li>3. TO ASSURE ALL SOW SECTIONS ARE BEING ADDRESSED.</li> <li>4. TO RELATE DRD'S TO CWBS/SOW ITEMS.</li> <li>5. TO CROSS REFERENCE SECTIONS OF APPENDICES IF THE CWBS NUMBER IS NOT USED IN THE APPENDIX TO IDENTIFY SECTIONS.</li> </ol> <p>NOTE: IF THIS APPROACH IS USED THIS CHART SHOULD BE MADE A PART OF THE SOW.</p>									

FIGURE 1-3

6. The project manager should prepare a detailed checklist showing the mandatory items and the selected optional items as they apply to the main body or the appendices of the SOW.
7. The project manager should emphasize the use of preferred parts lists, standard subsystem designs, both existing and under development, as identified by the NASA Low Cost Systems Office, available hardware in inventory, off-the-shelf equipment, component qualification data, design criteria handbooks, and other technical information available to design engineers to prevent deviations from the best design practices.
8. Cost estimates (manning requirements, material costs, software requirements, etc.) developed by the cost estimating specialists should be reviewed by SOW contributors. Such reviews will permit early trade-off consideration on the desirability of requirements which are not directly related to essential technical objectives.
9. The project manager should establish schedules for submission of coordinated SOW fragments from each task team member. He must assure that these schedules are compatible with the schedule for the RFP issuance. The Statement of Work should be prepared sufficiently early to permit full project coordination and to ensure that all project requirements are included. It should be completed in advance of RFP preparation.
10. While the primary purpose of the RFP package handbook series is directed towards preparing a single RFP, it is mandatory, in those cases where major elements of a complex system are to be separately procured that all elements of the associated procurement documents be mutually compatible.

## 106 EDITOR AND WRITER'S GUIDE

1. Every SOW which exceeds two pages should have a Table of Contents which should conform to the CWBS coding structure. There should rarely be items in the SOW which are not shown on the CWBS; however, it is not absolutely necessary to restrict items to those cited in the CWBS. SOWs for studies or support services which do not lend themselves to a CWBS coding structure may be structured along lines indicated in Chapter 4 of this manual.
2. Clear and precise task descriptions are essential. The SOW writer should realize that his efforts will have to be read and interpreted by persons of varied background (such as lawyers; buyers; engineers; cost estimators; accountants; and specialists in production, transportation, security, audit, quality, finance, and contract management). A good SOW states *precisely the product or service* desired by NASA. The clarity of the SOW will affect administration of the contract since it defines the scope of work to be performed. Any work which falls outside that scope will involve new procurement with probable increased costs.
3. The most important thing to keep in mind when writing an SOW is the most likely effect the written word will have upon the reader. Therefore, every effort must be

made to avoid ambiguity. All obligations of the Government should be carefully spelled out. If approval actions are to be provided by the Government, set a time limit. If Government Furnished Equipment (GFE) and/or services, etc., are to be provided, state the nature, condition, and time of delivery if feasible.

4. Remember that any provision which takes control of the work away from the contractor, even temporarily, may result in relieving the contractor of responsibility.
5. In specifying requirements, use *active* rather than *passive* terminology. Say *the contractor shall conduct a test* rather than *a test should be conducted*. In other words, when a firm requirement is intended, use the mandatory term "shall" rather than the permissive term "should".
6. Limit abbreviations to those in common usage. Provide a list of all abbreviations and acronyms to be used at the beginning of the SOW. When citing something for the first time, spell it out and show the abbreviation or acronym in parenthesis following the word or words.
7. When it is important to define a division of responsibilities among NASA, the contractor, other agencies, etc., a separate section of the SOW (in an appropriate location) should be included to delineate such responsibilities. Imputed definitions which provide a common basis for understanding between the contractor and NASA should be included in a separate section (in an appropriate location) of the SOW.
8. Include procedures. When immediate decisions cannot be made, it may be possible to include a procedure for making them (e.g. "as approved by the contracting officer," or "the contractor shall submit a report each time a category B failure occurs").
9. Do not overspecify. Depending upon the nature of the work and the type of contract the ideal situation may be to specify results required or end items to be delivered and let the contractor propose his best method.
10. Describe requirements in sufficient detail to assure clarity, not only for legal reasons, but for practical application. It is easy to overlook many details. It is equally easy to be repetitious. Beware of both. For every piece of deliverable hardware, for every report, for every immediate action, do not specify that something be done "as necessary". Rather, specify whether the judgment is to be made by the contractor or by the Government. Be aware that these types of contingent actions may have an impact on price as well as schedule. Where expensive services, such as technical liaison, are to be furnished, do not say *as required*. Provide a ceiling on the extent of such services, or work out a procedure (e.g., a level of effort, pool of man-hours) that will ensure adequate control.
11. Avoid incorporating extraneous material and requirements. They may add unnecessary cost. Data requirements are common examples of problems in this area. Screen out unnecessary data requirements and specify only what is essential and when. It is recommended that data requirements be specified separately in a Data Requirements Appendix or equivalent.

12. Do not repeat detailed requirements or specifications which are already spelled out in applicable documents. Instead, incorporate them by reference. If amplification, modification, or exceptions are required, make specific reference to the applicable portions and describe the change.

## 107 STATEMENT OF WORK CHECKLIST

A checklist is furnished below to provide considerations which the SOW writers should keep in mind in preparing Statements of Work:

1. Is the SOW (when used in conjunction with the Preliminary CWBS) specific enough to permit a contractor to make a tabulation and summary of manpower and resources needed to accomplish each SOW task element?
2. Are specific duties of the contractor stated so he will know what is required and can the contracting officer's representative, who signs the acceptance report, tell whether the contractor has complied?
3. Are all parts of the SOW so written that there is no question as to what the contractor is obligated to do, and when?
4. When it is necessary to reference other documents, is the proper reference document described? Is it properly cited? Is all of it really pertinent to the task, or should only portions be referenced? Is it cross referenced to the applicable SOW Task Element?
5. Are any specifications or exhibits applicable in whole or in part? If so, are they properly cited and referenced to the appropriate SOW element?
6. Are directions clearly distinguishable from general information?
7. Is there a time-phased data requirement for each deliverable item? If elapsed time is used, does it specify calendar or work days?
8. Are proper quantities shown?
9. Have headings been checked for format and grammar? Are subheadings comparable? Is the text compatible with the title? Is a multidecimal or alpha-numeric numbering system used in the SOW? Can it be cross-referenced with the CWBS?
10. Have Part 3, Subpart 5 and other appropriate portions of the NASA Procurement Regulation been followed?
11. Has extraneous material been eliminated?
12. Can SOW task/contract line items and configuration item breakouts at lower levels be identified and defined in sufficient detail so they can be summarized to discreet third level CWBS elements?

13. Have all requirements for data been specified separately in a Data Requirements Appendix or equivalent? Have all extraneous data requirements been eliminated?
14. Are security requirements adequately covered if required?
15. Has its availability to contractors been specified?

## 108 MANAGEMENT REVIEW

During development of the Statement of Work, the project manager should ensure adequacy of content by holding frequent reviews with project and functional specialists to determine that technical and data requirements specified do conform to the guidelines herein and adequately support the common system objective. The CWBS/SOW matrix should be used to analyze the SOW for completeness. After all comments and inputs have been incorporated, a final team review should be held to produce a draft SOW for review by functional and project managers. Specific problems should be resolved and changes made as appropriate. A final draft should then be prepared and reviewed with the program manager, contracting officer, or with higher management if the procurement is a major NASA acquisition. The final review should include a briefing on the total RFP package. If other program offices or other Government agencies will be involved in the procurement, obtain their concurrence also.

## 109 EXAMPLES OF STATEMENTS OF WORK

The following chapters contain outlines which are to be considered as *examples only* of possible tasks that should be considered by the project manager in preparing an SOW. They are *not* mandatory task outlines, nor considered to be all inclusive, or intended to pre-ordain contractors' extension of the WBS.

## CHAPTER 2: STATEMENTS OF WORK FOR STUDY AND PRELIMINARY DEFINITION CONTRACTS

### 200 INTRODUCTION

Statements of Work for study and preliminary definition contracts should permit contractors the latitude needed for research, analysis, creativity, and innovation. Most Statements of Work for these types of efforts will be developed from advanced studies and supporting research and technology performed in-house at NASA Centers, at universities, or by other contractors. There may be several studies conducted simultaneously or studies may be recycled one or more times to achieve the desired balance between technical requirements and cost.

### 201 CONTENT

The purpose of the study or preliminary definition SOW is to describe the efforts necessary to supplement existing information and carry it beyond its present levels to a point where more detailed study or definition may be conducted, or a selection of most likely systems or configurations can be made. The SOW paragraph coding may be accomplished as shown in paragraph 202.

### 202 EXAMPLE OF SOW CONTENT

- 1.0 *Introduction* - The purpose of the (XYZ) Study Project is to define alternate candidate solutions for a launch vehicle system which is capable of inserting the following types of unmanned satellites into earth orbit. (The "purpose" should broadly describe what the procurement is expected to achieve and provide sufficient background and introductory information to show how it relates to the total program or project. It would normally contain subparagraphs as follows):
  - 1.1 *Overall Project* - (Objectives)
  - 1.2 *Relationship of Study to Overall Project* - (Objectives)
  - 2.0 *Scope of Work* - This Statement of Work defines the study effort to be undertaken by the contractor on a two stage fully reusable launch vehicle system.
    - 2.1 *Study Objectives*
      - 2.1.1 *Definition of the (XYZ) Launch Vehicle System*
      - 2.1.2 *Preliminary Design Objectives*
      - 2.1.3 *Performance Requirements*
    - 2.2 *Technical Approach* - The general technical approach contemplated under the proposed contract.
  - 3.0 *Project Schedule*
  - 4.0 *Contract Tasks*
    - 4.0.1 *Program Management*
      - 4.1 *Preliminary Engineering, Design, Studies*
        - 4.1.1 *System Analysis*

- 4.1.2 *Design Analysis*
- 4.1.3 *Subsystems Definition*
- 4.1.4 *Configuration Management*
- 4.1.4.1 *Configuration Preliminary*
- 4.1.5 *Configuration Preliminary Verification*
- 4.1.6 *Supporting Research and Technology*
- 4.1.7 *Reliability Program Plan*
- 4.1.8 *Safety Plan*
- 4.2 *Study Briefing and Reports* - The contractor shall prepare the information resulting from studies as required in the Data Requirements Description (DRD).
- 4.2.1 *Interim Study Report* - The contractor shall develop an interim study report within \_\_\_\_\_ days from the date of contract approval.
- 4.2.2 *Interim Briefing* - The contractor shall . . . etc., . . . within \_\_\_\_\_ days as required.
- 4.2.3 *Final Report* - The contractor shall develop a final report as required in the DRD.
- 4.2.4 *Final Briefing* - The contractor shall \_\_\_\_\_ days prior to the final report present the final briefing as described in the DRD.
- 4.3 *Special Emphasis Areas* - The results of the study program to be depicted in the study reports and briefings specified in tasks 4.1 and 4.2 above shall include the following areas of special emphasis.
  - 4.3.1 *Aerodynamics*
  - 4.3.2 *Integrated Thermal Protection*
  - 4.3.3 *Integrated Avionics*
  - 4.3.4 *Propulsion*
  - 4.3.5 *Reliability*
- 4.4 *Study Results*
  - 4.4.1 *Payload*
  - 4.4.2 *Gross Weight* - Weight budget.
  - 4.4.3 *Center of Gravity* - Budget
  - 4.4.4 *Cross Range*
  - 4.4.5 *Launch Constraints*
  - 4.4.6 *Propulsion*
  - 4.4.7 *Reliability*
  - 4.4.8 *Maintainability*
  - 4.4.9 *Risk Areas*
  - 4.4.10 *Mission Operations and Ground Support*
- 4.5 *Project Management*
  - 4.5.1 *Contract Work Breakdown Structure with Dictionary*
  - 4.5.2 *Validation Items*
  - 4.5.3 *GFE Items*
  - 4.5.4 *Standard Parts and Off-the-shelf Items*
  - 4.5.5 *Producibility*
  - 4.5.6 *Make or Buy Plan* - Considerations
  - 4.5.7 *Reporting Data for Each CWBS Element*
  - 4.5.8 *Logic Network*
- 4.6 *Risk Analysis*
- 5.0 *Study Management*
  - 5.1 *NASA Organization, Contracting Office, Study Manager*
  - 5.2 *Study Management Specifications*



- 6.0 *Guidelines*
- 6.1 *Approach*
- 6.2 *Study Guidelines*
- 6.3 *Referenced Studies and Data*
- 6.4 *Constraints*
- 7.0 *Data Requirements Appendix or equivalent*
- 7.1 *Document Change Log*
- 7.2 *Page Revision Log*
- 7.3 *Table of Contents*
- 7.4 *Introduction*
- 7.5 *Statement of General Requirements*
- 7.6 *DRD Maintenance Procedures*
- 7.7 *Data Requirements*
  - 7.7.1 *Program Management*
  - 7.7.2 *Configuration Management*
  - 7.7.3 *Manpower and Cost*
  - 7.7.4 *Studies - Tasks*
  - 7.7.5 *Special Emphasis Studies*
  - 7.7.6 *Plans - Technical*
  - 7.7.7 *Reports*
  - 7.7.8 *Presentations*
- etc. . . .

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## CHAPTER 3: STATEMENTS OF WORK FOR DEFINITION AND DEVELOPMENT OF MAJOR SYSTEMS

### 300 INTRODUCTION

1. Definition and development will normally follow study and/or preliminary definition efforts and the products of these should be available for inclusion in the Statement of Work or for reference purposes. The preparation of Work Statements for definition or development should parallel, as much as possible, the latest preliminary phases to provide continuity and feedback between the two phases.
2. Although contracting for definition or development cannot commence until the program has been authorized, the planning necessary for a good RFP and SOW should be started as early as practicable and not be deferred because the new program start has not been authorized.

### 301 DEVELOPMENT OF THE STATEMENT OF WORK FOR DEFINITION AND DEVELOPMENT OF MAJOR SYSTEMS

1. The SOW identifies full scale tasks and requirements tied to the CWBS. It is prepared as part of the RFP. The SOW used in the RFP is the responsibility of the NASA procuring activity even though it may have evolved from the results of study or preliminary definition performed by contractors, universities, or non-profit institutions.
2. In preparing each SOW task statement all requirements necessary to complete each task element of the preliminary CWBS should be identified. These task statements must be sufficiently complete to enable the proposer to generate all of the desired information for design, prototyping, verification, fabrication, assembly, inspection, checkout, safety tests, etc.

### 302 SAMPLE STATEMENT OF WORK OUTLINE BASED ON A CWBS

#### 1.0.0.0 *Deliverable Item(s)*

\_\_\_\_ *Spacecraft* - Design, development and verification of the subject system. This paragraph should address the system or subsystem being procured and how it relates to the total system and the mission to be performed, including the specification and validation requirement.

1.1.0.0 *Project Management* - This paragraph should state the broad aspects of the project management requirements. Include the project management plan requirement.

1.1.1.0 *Project Planning and Control*

1.1.1.1 *Contract Work Breakdown Structure*

1.1.1.2 *Reporting*

1.1.2.0 *Configuration Management*

- 1.1.2.1 *Configuration Identification*
- 1.1.2.2 *Configuration Control*
- 1.1.2.3 *Interface Management*
- 1.1.2.4 *Design Reviews and Inspections*
- 1.1.2.5 *Configuration Accounting*
- 1.1.2.6 *Noncompliance*
- 1.1.2.7 *Predelivery Turnover*
- 1.1.2.8 *Configuration Management Audits*
- 1.1.2.9 *Formal Technical Reviews*
- 1.1.2.10 *Certification of Flight Worthiness*
- 1.1.2.11 *Project Change Proposals*
- 1.1.3.0 *Subcontract Management*
- 1.1.3.1 *Organization*
- 1.1.3.2 *Procurement System*
- 1.1.3.3 *Applicability of Procurement System to Subcontractor*
- 1.1.3.4 *Make or Buy Plan*
- 1.1.4.0 *Project Reviews*
- 1.1.4.1 *Initial Orientation Briefing*
- 1.1.4.2 *Monthly Progress Reviews*
- 1.1.4.3 *Quarterly Progress Reviews*
- 1.1.4.4 *Technical Progress Reviews*
- 1.1.4.5 *Experiment Reviews*
- 1.1.4.6 *Project Status Reports*
- 1.1.4.7 *Contractor Control Center*
- 1.1.4.8 *Security*
- 1.1.4.9 *Liaison*
- 1.1.5.0 *Data Management*
- 1.1.5.1 *Organization*
- 1.1.5.2 *Control of Data Preparation*
- 1.1.5.3 *Data Acquisition from Subcontractors*
- 1.1.5.4 *Data Delivery and Distribution*
- 1.1.5.5 *Reporting*
- 1.1.5.6 *Storage and Retrieval*
- 1.1.5.7 *Maintenance*
- 1.1.5.8 *Data Requirements*
- 1.1.5.9 *Documentation Historical File*
- 1.1.6.0 *Technology Utilization Reporting*
- 1.1.7.0 *Risk Analysis*
- 1.1.8.0 *Cost Analysis*
- 1.1.8.1 *Cost Reduction Candidate Analysis*
- 1.1.8.2 *Runout Cost Initial Analysis*
- 1.1.8.3 *Runout Cost Continual Maintenance*
- 1.2.0.0 *Systems Engineering and Integration* - This paragraph should address the overall systems engineering management effort. Use appropriate specification if available.
- 1.3.0.0 *Quality Assurance* - See Appendix \_\_\_\_.
- 1.4.0.0 *Reliability* - See Appendix \_\_\_\_.
- 1.5.0.0 *Safety* - See Appendix \_\_\_\_.

1.6.0.0 *Commonality Studies* - This should be a continuation of the effort started in the pre-development phases for use of qualified parts, off-the-shelf equipment, existing hardware, etc.

1.7.0.0 *Logistics Support* - Appendix \_\_\_\_.

\* \* \*

1.10.0.0 *Design and Development of the Primary Mission Product or Space Vehicle* - This paragraph should address in detail the design, development, fabrication, assembly, and testing of the primary mission product. Specifications and other applicable technical references should be cited.

1.10.0.1 *Identify Third Level CWBS Elements* - As appropriate, identify 3rd. level (and lower if necessary) CWBS elements characteristics already described in the specification(s) do not need to be repeated but should be cross-referenced. Critical components should be identified under each level 3 element.

1.11.1.0 *Multiple Products* - Use these paragraphs for multiple products (i.e., 1.11.1.1 Test Article #1, #2; 1.12.1.0 Flight Article #1, #2; 1.13.1.0 Etc.)

1.14.0.0 *Design and Development of Operational Support Equipment* - This paragraph should describe the detailed design of deliverable operational support equipment. Cite applicable specifications.

1.14.1.0 *Third Level CWBS Elements for Operational Support Equipment* - This paragraph should describe the 3rd. level CWBS elements to accomplish the above task(s).

\* \* \*

1.20.0.0 *Systems Test and Evaluation* - This paragraph should address the contractual systems test plan including category I and II test and support. The design and fabrication of individual test articles will be included in this element. The contractor shall plan and conduct the system(s) test(s) described in the following elements according to the test requirement(s) or objective(s) of Section \_\_\_\_ of Specification \_\_\_\_.

1.20.1.1 *ST&E Tasks to be Performed* -

\* \* \*

1.30.0.0 *Mockups* - Include both Engineering and Production Mockups as specified.

\* \* \*

1.35.0.0 *Facilities* - Appendix \_\_\_\_.

1.36.0.0 *Tooling* - Appendix \_\_\_\_.

1.37.0.0 *Special Test Equipment* - Appendix \_\_\_\_.

1.40.0.0 *Launch Operations Requirements* - Appendix \_\_\_\_.

1.50.0.0 *Mission Operations Requirements* - Appendix \_\_\_\_.

*Note:* The above breakdown is an example only. It should *not* be taken as the only way to put an SOW together. The important thing to remember is to maintain continuity of paragraph numbers with the CWBS in a logical and orderly manner and preserve the indenture of systems, subsystems, tasks, subtasks, etc.

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## CHAPTER 4: STATEMENTS OF WORK FOR SUPPORT SERVICES

### 400 INTRODUCTION

Statements of Work for support services can be written to either conform with a CWBS or not, depending on the degree of technical orientation involved and the precision with which CWBS task elements may be specified. Generally the use of an appropriate CWBS is recommended. In nearly all cases where the proposed contract will be for technical integration, operation of automated facilities or control centers (e.g., operational facilities for control of spacecraft), systems analysis or engineering support, or other activities of a similar nature, it is highly advisable to use a CWBS. It is not necessary to specify level 3 task elements, if they cannot be precisely identified, or if level 2 is adequate.

### 401 OUTLINE OF STATEMENT OF WORK FOR SUPPORT SERVICES

Two suggested outlines for support services SOWs are presented in this chapter. The first is fashioned after an assumed CWBS. The second outline does not depend upon a CWBS but may be used for any support services application. Both are provided with alternate formats when it is possible to specify tasks by major functions.

#### *a. Outline with Contract Work Breakdown Structure*

##### *1.0 INTRODUCTION*

##### *1.0.1 GENERAL*

This is the Statement of Work for the provision of \_\_\_\_\_ Services for the \_\_\_\_\_ Center.

##### *1.1 SCOPE OF WORK*

The contractor shall *maintain and operate facilities and perform engineering, scientific, and programming tasks*. The organizations to be supported are:

Guidance and Control Division

Lunar and Earth Sciences Division

Computation and Analysis Division

Information Systems Branch of the Data Division

##### *1.2 FUNCTIONS TO BE PERFORMED BY ORGANIZATION ELEMENT*

##### *1.2.1 GUIDANCE AND CONTROL DIVISION*

##### *1.2.1.1 GENERAL*

##### *1.2.1.1.1 MISSION DESCRIPTION*

The Guidance and Control Division is responsible for providing the technological support for guidance and control systems of current and future manned space flight programs. This responsibility includes the operation of laboratory facilities to insure complete determination of component and system performance from the initial design to the evaluation of production type hardware.

*1.2.1.1.2 STATEMENT OF FUNCTIONS*

List those functions to be performed throughout the divisional elements such as: Logistics, Housekeeping, Equipment Operation, Equipment Maintenance, Job Scheduling and Processing. List on-site and off-site requirements separately and briefly describe the equipment, facilities, etc., to be used by contractor.

*1.2.1.1.3 SHIFT AND HOURS OF WORK*

State shifts and hours of work for divisional elements unless contract is on an 8 hour day.

*1.2.1.2 SIMULATION LABORATORY*

*1.2.1.2.1 MISSION DESCRIPTION*

This laboratory is responsible for the planning, developing, operating, and controlling the configuration of simulators for the study and development, and evaluation of spacecraft guidance and control system requirements, performance and operating procedures.

*1.2.1.2.2 STATEMENT OF FUNCTIONS*

List those functions peculiar to this laboratory and not in Division statement such as:

Design, develop, and document cockpit mockups with necessary instruments, controls, and displays.

*1.2.1.3 INERTIAL LABORATORY*

*1.2.1.3.1 MISSION DESCRIPTION*

*1.2.1.3.2 STATEMENT OF FUNCTIONS*

*1.2.2 LUNAR AND EARTH SCIENCES DIVISION*

*b. Alternate Outline for SOW with CWBS*

It is highly possible that a SOW can be described by *major functions* to be performed especially in the nontechnical service contracts that support Center-wide activities. The functional type format is desirable for such work as reproduction, warehousing, roads and ground maintenance, and security guards. The functional outline is also desirable in that the functional elements can be compatible with the WBS. This makes the SOW, Cost Proposals, and the ultimate cost reporting in consonance. In writing a functional SOW, Part 1.0 Introduction would be substantially the same except organizational elements would be omitted and the term "Center" would be used. Part 1.2 could be as follows:

*1.2 FUNCTIONS TO BE PERFORMED*

*1.2.1 REPRODUCTION SERVICES*

*1.2.1.1 MISSION DESCRIPTION*

State type of reproduction to be done and equipment used, how the contractor gets the work (job order - work order), what Center elements or other service contractors are not supported, documents not to be reproduced (classified - RFP's).

*1.2.1.2 STATEMENT OF FUNCTIONS*

List what contractor is supposed to do such as operate and maintain equipment, punching and binding, supply responsibilities, job order control.



### 1.2.1.3 SHIFT AND HOURS OF WORK

Self explanatory

#### c. Outline without Contract Work Breakdown Structure

##### 1.0 INTRODUCTION

###### A. GENERAL

This is the statement of work for the provision of \_\_\_\_\_ support services for the \_\_\_\_\_ Center.

##### 2.0 SCOPE OF WORK

This Statement of Work describes the functions to be performed by the contractor to *maintain and operate facilities and to perform engineering, scientific and programming tasks*. The organizations to be supported in the \_\_\_\_\_ Directorate (s) are:

Guidance and Control Division

Lunar and Earth Sciences Division

Computation and Analysis Division

Information Systems Branch of the Data Division

##### 3.0 FUNCTIONS TO BE PERFORMED BY ORGANIZATION ELEMENT

###### A. GUIDANCE AND CONTROL DIVISION

###### 1. a. Mission Description

The Guidance and Control Division is responsible for providing the technological support for guidance and control systems of current and future manned space flight programs. This responsibility includes the operation of laboratory facilities to insure complete determination of component and system performance from the initial design to the evaluation of production-type hardware.

###### b. Statement of Functions

List those functions to be performed throughout the divisional elements such as: Logistics, Housekeeping, Equipment Operation, Equipment Maintenance, Job Scheduling and Processing.

###### c. Shift and Hours of Work

State shifts and hours of work for divisional elements unless entire contract is on an 8 hour day.

###### 2. SIMULATION LABORATORY

###### a. Mission Description

This laboratory is responsible for the planning, developing, operating, and controlling the configuration of simulators for the study and development, and evaluation of spacecraft guidance and control system requirements, performance and operating procedures.

###### b. Statement of Functions

List those functions peculiar to this laboratory and not in division statement such as: Design, develop, and document cockpit mockups with necessary instruments, controls, and displays.

###### 3. INERTIAL LABORATORY

###### a. Mission Description

###### b. Statement of Functions

###### B. LUNAR AND EARTH SCIENCES DIVISION

d. *Alternate Outline for SOW without CWBS*

It is highly possible that a SOW can be described by *major functions* to be performed especially in the nontechnical service contracts that support Center-wide activities. The functional type format is desirable for such work as reproduction, warehousing, roads and grounds maintenance, and security guards. The functional outline is also desirable from the point that the functional elements can be compatible with the Work Breakdown Structure. This makes the SOW, the WBS, the Cost Proposal, and the ultimate cost reporting system in consonance with each other. In writing a functional SOW Part 1.0, the Introduction, would be substantially the same as shown in paragraphs c. - 1.0 and 2.0 above, except organizational elements would be omitted and the term "Center" would be used. Part 2.0, could be as follows:

2.0 *FUNCTIONS TO BE PERFORMED*

A. REPRODUCTION SERVICES

1. MISSION DESCRIPTION

State type of reproduction to be done and equipment used, how the contractor gets the work (job order—work order), what Center elements or other service contractors are not supported, documents not to be reproduced (classified—RFPs).

2. STATEMENT OF FUNCTIONS

List what the contractor is supposed to do such as operate and maintain equipment, punching and binding, supply responsibilities, job order controls.

3. SHIFT AND HOURS OF WORK

Self explanatory

## SAMPLE OUTLINE

### APPENDIX \_\_\_\_ : QUALITY ASSURANCE AND RELIABILITY

#### 1.3.0.0 *Quality Assurance*

This paragraph should require the contractor to state his quality policy and philosophy in general terms and cite the applicable NASA requirements.

#### 1.3.1.0 *Quality Organization and Management*

#### 1.3.2.0 *Quality Engineering*

#### 1.3.3.0 *Procurement Support*

#### 1.3.4.0 *Inspection and Test*

#### 1.3.5.0 *Calibration and Metrology*

#### 1.3.6.0 *Quality Information and Data Retention*

#### 1.3.7.0 *Quality Assurance System Validation*

#### 1.3.8.0 *Quality Assurance Plan (From successful proposer)*

#### 1.3.9.0 *Inspection and Checkout - to be included under Hardware and Verification definition*

#### 1.4.0.0 *Reliability*

This paragraph should require the contractor to state his reliability policy and philosophy in general terms and cite the NASA Requirement NHB 5300.4(1A) (PR Part 1, Subpart 51).

#### 1.4.1.0 *Reliability Organization and Management*

#### 1.4.2.0 *Reliability Design Criteria*

#### 1.4.3.0 *Numerical Estimates*

#### 1.4.4.0 *Failure Mode and Effects Analysis*

#### 1.4.5.0 *Problem Reporting and Corrective Action*

#### 1.4.6.0 *Parts and Materials*

#### 1.4.7.0 *Reliability Testing*

#### 1.4.8.0 *Maintainability*

#### 1.4.9.0 *Design and Readiness Reviews (Reliability)*

#### 1.4.10.0 *Reliability System Validation*

#### 1.4.11.0 *Reliability Plan - (from successful proposer)*

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## SAMPLE OUTLINE

### APPENDIX \_\_\_\_ : SAFETY REQUIREMENTS

#### *1.5.0.0 Safety*

State Requirement for a Company Safety philosophy, policy, and practices in general terms.

#### *1.5.1.0 Safety Organization and Management*

#### *1.5.2.0 System Safety Analysis*

#### *1.5.3.0 System Safety Plan - (from successful proposer)*

#### *1.5.3.x Safety to be included in Risk Analysis*

#### *1.5.4.x Safety Testing to be included in verification program*

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## SAMPLE OUTLINE

### APPENDIX \_\_\_\_ : COMMONALITY STUDIES

#### *1.6.0.0 Commonality Studies*

This should be a continuation of the effort started in the pre-acquisition phase to use qualified parts, off-the-shelf equipment, and existing hardware as well as the common use of new parts, subsystems, systems, etc.

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## SAMPLE OUTLINE

### APPENDIX \_\_\_\_ : LOGISTICS AND SUPPORT

- 1.7.0.0 Logistics Support*
- 1.7.1.0 Engineering and Requirements*
- 1.7.2.0 Spares and Supply*
- 1.7.3.0 Training*
- 1.7.4.0 Field Support*
- 1.7.5.0 Training Equipment*

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**CHAPTER 5: STATEMENTS OF WORK FOR SMALL R & D  
CONTRACTS (\$100,000 OR LESS)**

**500 GENERAL SCOPE OF WORK**

State the specific requirements for the intended use and application of this contract effort.

**501 DESCRIPTION OF TASK TO BE PERFORMED**

State *precisely* the product or service desired. Describe the effort required to study, analyze, determine the feasibility of, evaluate, design, develop, test, deliver, and support this contractual effort.

**502 END ITEM PRODUCT**

State the *specific* end product expected to result from this contract activity.

**503 REPORTING REQUIREMENTS**

**504 SCHEDULE**

Provide sufficient detail for the contractor to establish specific detail milestones against which his progress will be measured. All significant tasks leading to the development of the contract end item should be identified.

**505 BACKGROUND**

1. *Specification*
2. *Reliability, Quality, Safety, etc.,*
3. *GSE (if applicable)*
4. *Applicable Documents*