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MIL-PRIME - THE PERFORMANCE ORIENTED BUSINESS APPROACH

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INTRODUCTION

This paper provides an overview of ASD's Deputy for Engineering performance oriented business approach, more popularly known as "Mil-Prime." The development of Mil-Prime specifications and standards is certainly not a new subject at ASD. What is new is the integration of these tailorable, performance oriented documents with the System Engineering Master Schedule concept, enhanced RFP preparation activities, and a streamlined source selection process. The effectiveness of these activities reflects the synergism of this corporate business approach.

Mil-Prime Background

The genesis of the EN Mil-Prime program goes back to the late 70's and was in response to some very high level concerns regarding the development and application of acquisition specifications and standards. A 1975 memo from the Deputy Secretary of Defense cited the blanket application and unbounded sub-tiering of development specifications and standards as a major cost driver on DoD system acquisition programs. It further charged that the DoD acquisition process did not include adequate checks nor process controls to effect meaningful application of these documents. On the heels of the DoD memo came the 1977 Defense Science Board report. It included the straw that finally broke the backs of the entrenched specification bureaucrats. The DSB concluded that the blanket application of layer upon layer of "design specifications" represented a "bottom-up" versus a "top-down" process. Rather than specifying functional needs, the documents dictated design solutions. The final straw was their indictment, and rightly so, that the "bottom-up" process not only failed to develop systems in response to user operational needs but it also was inhibiting technical growth. A fresh approach was mandated.

DoD directed that a complete review be made of policies on the development and application of acquisition documents. They further directed that implementation policies be established to require tailored application of development specifications on all new system acquisitions. DSB recommendations went further in that they addressed other crucial and fundamental factors such as:

1) Strengthening the process by which user operational needs are actually translated into system design requirements.

2) Reformating military design specifications to make the mandated tailoring process "user friendly" and understandable.

There were no sacred cows in the DSB recommendations. They went so far as to suggest the use of "Commercial" specifications and standards on military programs, a concept the bureaucrats considered to be blasphemy.

Over the years two situations developed in the evolution of development specifications:

- 1) "Design Solution" requirements began creeping in.
- 2) "Lessons Learned" which represented the DoD corporate history were being assimilated into these design solution requirements.

This continued because, in many instances, the specification of design solutions by the government proved to be successful from a performance standpoint. However, development specifications evolved to the point that they constrained the use of other effective design solutions. While "Lessons Learned" proved to be an effective tool in reducing the government's risk, they too often resulted in all available specifications being imposed in the attempt to cover all contingencies. This resulted in the generation of RFPs with hidden problems and massive document tiering. The specification of production type requirements or overspecified general requirements were also resulting in single design solutions. In short, too much guidance stifled innovative design solutions and restricted competition.

The ASD program went back to basics to upgrade development specifications and standards used in the ASD acquisition process. As reflected in Figure 1, the change required moving from "How To" documents to "Performance" oriented documents. The approach had to insure that acquisition documents communicated the performance characteristics of the product the user needed and that only appropriate specifications and standards were referenced therein. The goal was to prepare "program tailorable" development documents that would permit innovative design solutions. In retrospect, the EN response to these directives and recommendations was actually pretty straight forward — not easy, but nevertheless straight forward.

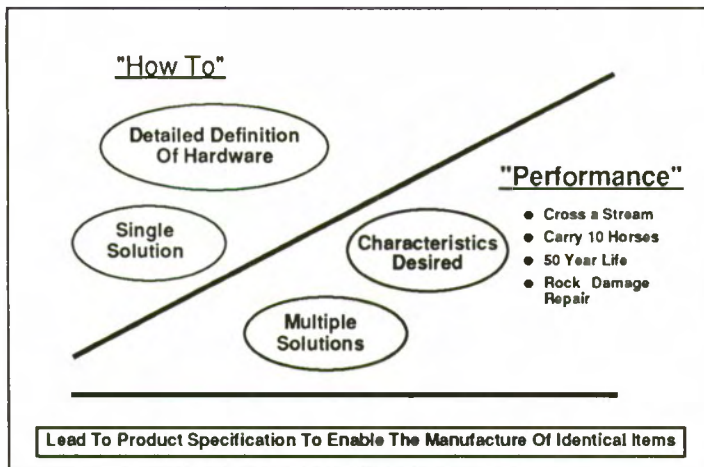


Figure 1 - "How To" vs "Performance" Specs

As shown in Figure 2, the ASD Mil-Prime philosophy was to prepare generic development documents that represented the best starting point for tailoring to specific program applications. These documents would state generic performance parameters with specific values left blank. There would be a 1 to 1 correlation of Section 3 Requirements to Section 4 Verification. Another mandatory requirement was to reduce the number of referenced specifications. The documents would also retain the DoD corporate history in a non-contractual "Lessons Learned" appendix handbook to assist in the tailoring process for program specific applications. At the start of the initiative, there were some 47,000 active DoD specifications and standards. Of that number, 43,000 were procurement related with about 4,000 used for development. Of the 4,000 development documents, 500 were in some use by ASD with about 50 - 60 being frequently used on major system acquisitions.

The scope of the task was doable.

- **Emphasize Performance Requirements**
 - ✓ Define Performance Parameters
 - ✓ Leave Specific Values Blank
- **1 To 1 Correlation Of Requirement To Verification**
- **Reduce Number Of References**
- **Retain "Lessons Learned" In A Non-Contractual Appendix To Assist In Tailoring**

Figure 2 - Mil-Prime Philosophy

The "Update" of over 50 major ASD acquisition documents has been completed to conform with the Mil-Prime philosophy. In fact, a number are already through their second revisions. The Landing Gear Mil-Prime provides a typical example of the reduction in specifications tiering. Prior to Mil-Prime, there were 13 different landing gear specifications which in turn referenced 256 other documents. There is now only 1 specification, MIL-L-87139, which references 2 other documents. Unfortunately there is limited interest in the Mil-Prime approach from other U.S. Services. The British Ministry of Defense, however, has stated that there is a positive interest in developing aerospace "Europrimes." The EN experience shows that the executive level at large Air Force prime contractors accept the approach. However, quite a few of their mid-level working managers and engineers do not. The experience at ASD is similar, but the course of the bureaucracy continues to be altered.

System Guide Specification

The most recently completed Mil-Prime document is the System Specification, AFGS-87253, completed under the DoD guide specification initiative approved in Nov 1986. The fundamental objectives of this System Level Mil-Prime are to provide consistent guidance for the translation and application of validated User operational needs, via the AFR 57-1 process, into system level design requirements that are:

- 1) Meaningful to meeting user operational needs.
- 2) Measurable during design development and test.
- 3) Achievable in performance, cost and schedule.
- 4) Maintainable per the User support strategy.

The critical challenge that developers of system specifications face is to accurately communicate the system characteristics of the product the user needs including affordability, maintainability, and supportability. Thus, AFGS-87253 places strong emphasis on the Systems Engineering Approach to design development. The "Upfront" integration of system issues such as support, maintenance, manpower, training, etc., is emphasized to make them proactive with the system engineering analysis, synthesis, and tradeoff process. Fundamental to this process is the disciplined, top-down flow of user operational needs into the level 2 and 3 tailored Mil-Prime specifications, thereby evolving a synergistic set of tailored development specifications.

Bureaucrats would probably say that AFGS-87253 is not in conformance with Mil-Std-490A, Specification Practices, because it does not follow the uniform paragraph numbering requirements. The System Mil-Prime was developed on a higher plane to emphasize the more essential requirements of Mil-Std-490A for system specifications to:

- 1) Properly state technical performance and opera-

tional mission requirements from the total system employment, deployment, operational, support, and maintenance perspective.

2) Require the upfront identification of system level interfaces between and/or among all functional areas.

3) Properly allocate, within system design constraints, the system level performance requirements to functional areas.

As shown in Figure 3 and Figure 4, the system guide specification does follow traditional format regarding Scope, Applicable Documents, Requirements, Verification, Preparation for Delivery, and Note Sections. There are, however, a number of unique features. They are:

1) Specifying, in Section 3 Requirements, the intended scenario and mission descriptions against which the system

<ul style="list-style-type: none"> 1.0 SCOPE. 1.1 IDENTIFICATION. 1.2 APPLICATION. 1.3 INTRODUCTION. 	<ul style="list-style-type: none"> 3.1.5 Operational Effectiveness. 3.1.5.1 Availability. 3.1.5.2 Operational Availability. 3.1.5.3 Mission Reliability.
<ul style="list-style-type: none"> 2.0 APPLICABLE DOCUMENTS 2.1 GOVERNMENT DOCUMENTS 2.2 ORDER OF PRECEDENCE. 	<ul style="list-style-type: none"> 3.1.6 Systems Interfaces. 3.1.6.1 Internal. 3.1.6.2 External.
<ul style="list-style-type: none"> 3.0 REQUIREMENTS. 3.1 MISSION/OPERATIONAL PERFORMANCE. 3.1.1 Scenarios, Operational Concepts And Support Concepts. 3.1.2 Mission Descriptions. 3.1.2.1 Deployment Requirements. 3.1.3 Mission Level Constraints. 3.1.4 Environment. 3.1.4.1 Natural. 3.1.4.2 Induced. 3.1.4.3 Threat. 	<ul style="list-style-type: none"> 3.1.7 Supportability. 3.1.7.1 System Maintainability. 3.1.7.2 Manpower and Personnel. 3.1.7.3 Maintenance System. 3.1.7.4 Training Support. 3.1.7.5 Support Of Computer Resources. 3.1.7.6 Facilities. 3.1.7.7 Packaging/Handling/Storage/Transp. 3.1.7.8 Battle Damage Repair. 3.1.8 Operational Service Life. 3.2 SYSTEM DESCRIPTION. 3.2.1 System Elements. a. Air Vehicle b. Integrated Support System c. Training System

Figure 3 - AFGS-87253 Contents

level requirements are defined for both peacetime and wartime operations. Under Mil-Std-490A these descriptions would be included in the noncontractual Section 6 Notes.

2) Expressing, at the system level, operational requirements in User oriented terms which define quantitative requirements for military utility. Measures of merit are used as criteria to assess operational utility. For example: ton-miles per day, tank kills per sortie, et cetera.

3) Defining all internal and external interfaces with other systems, equipments, operations, training, deployment environments, et cetera.

4) Providing guidance for in-process verification requirements.

The Section 3.1.7 Supportability requirements, based upon the requirements of Sections 3.1.1 through 3.1.6, must reflect compatibility with items that affect the readiness/availability of the system; e.g., the number of systems, system diagnostics and testability, fault tolerance, employment related requirements, battle damage repair, man-

power, personnel, training, safety, et cetera.

The Design and Construction Section guidelines focus on tailoring system design criteria that are applicable to all elements of the system. For Example:

1) System level computer software requirements pertaining to system architecture, computer language, software/hardware interfaces, et cetera.

2) System level requirements for use, control, and disposal of hazardous materials for all aspects of operation, maintenance, and training.

The basic objectives of Section 4 Verification are to define the various demonstrations, tests, methods of verification, etc., which will be utilized to verify quality conformance to Section 3 system requirements. As seen in Figure 4, AFGS-87253 also recognizes that process control may be an appropriate verification alternative for rate production. Such verification would only be used after the integrated set of system elements have met all qualification criteria and have demonstrated full compliance with the requirements of Section 3. Section 4.2 provides guidance and illustrations for defining in-process (during design development) verification requirements, if appropriate. The intent of this type of verification requirement is to track progress of design compliance with key Section 3 system requirements. In-process verification requirements would be based on key system engineering activities that are deemed critical to successfully meeting the selected Section 3 system requirements. Technical Performance Measurement (TPM) tracking parameters, including tolerances, must likewise be established for those selected activities. The tracking parameters must be measurable by acceptable technical practices, e.g., analysis, simulation, tests, et

<ul style="list-style-type: none"> 3.2.2 Design And Construction. 3.2.2.1 Computer Resources. 3.2.2.2 Common Sys Characteristics. 3.2.2.3 Standardization. 3.2.2.4 Nameplates/Product Markings. 3.2.2.5 Producibility. 3.2.2.6 Workmanship. 3.2.2.7 System Safety. 3.2.2.8 Nuclear Control Requirments. 3.2.2.9 Cor/Mat Degradation Res. 3.2.2.10 Electromagnetic Compatibility. 3.2.2.11 Human Factors. 3.2.2.12 Hazardous Materials. 3.3 PRECEDENCE. 4.0 VERIFICATION 4.1 GENERAL 4.1.1 Test Requirements Verification 4.1.1.1 Full Scale Engr Dev Test Program. 4.1.1.2 Special Tests. 4.1.2 Methods Of Verification. a. Inspection. b. Analysis. c. Demonstration d. Test e. Process Control 	<ul style="list-style-type: none"> 4.2 IN-PROCESS VERIFICATION MEASUREMENT 4.3 QUALITY CONFORMANCE. 4.3.1 Mission/Operational Performance. 4.3.2 System Description. 4.4 RESPONSIBILITY FOR CONTROL OF PRODUCT QUALITY. 4.4.1 Responsibility For Conformance. 4.4.2 Responsibility For Verification. 5.0 PREPARATION FOR DELIVERY. 6.0 NOTES. 6.1 APPENDIXES. 6.2 REFERENCE DOCUMENT TREE 6.3 SUBJECT TERMS (Key Words) 6.4 RESPONSIBLE ENGINEERING OFFICE APPENDIX A - Requirements/Verification (Sample) APPENDIX B - Definitions APPENDIX C - SEMS (Example) APPENDIX D - Sample System Specification
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Figure 4 - AFGS-87253 Contents (Cont.)

et cetera.. Measures such as "percent complete" are usually arbitrary and misleading and should be avoided. The following

are examples of in-process verification requirements:

"4.2.X Development of required Interface Control Documents (ICDs) shall be verified by a combination of inspection, analysis, and/or laboratory demonstrations. Compliance with the internal and external system interface requirements specified in 3.1.6.1 and 3.1.6.2 must be demonstrated. ICDs are considered complete when details of the required interface testing are specified in applicable detailed test plans."

"4.2.Y System engineering integration of User supportability requirements defined in 3.1.7.1 through 3.1.7.8 shall be validated by analysis, trade studies, etc., during FSED."

Section 4.3, Quality Conformance, is intended to specify the method(s) of verification for each Section 3 system requirement.

As an additional aid to developers of system specifications, the guide specification also includes four appendices which provide :

- 1) An illustration of appropriate definitions of test requirements and methods to preclude misinterpretation of section 4 verification requirements.
- 2) Definitions of terms used within the guide specification.
- 3) A simplified discussion of the System Engineering Master Schedule concept.
- 4) A sample system specification to further illustrate the application guidelines.

Systems Engineering Master Schedule

The Mil-Prime business approach extended beyond just the need to eliminate development documents that included unconstrained specification sub-tiering which in turn constrained design solutions. The corporate business approach also needed to embrace an environment which fostered:

- 1) Flexibility in system engineering management approaches.
- 2) Innovation in pursuit of design solutions to best meet user operational needs.

This fresh approach does not abrogate fundamental requirements for team planning and development of meaningful measures of merit to track design progress. The Systems Engineering Master Schedule (SEMS) concept, the keystone of our Mil-Prime performance oriented business approach, provides a disciplined approach for accomplishing these basic system management functions. The SEMS concept provides an improved framework to guide the interface with the contractor in assessing technical progress and associated develop-

ment risks for input to program management. It requires upfront planning and integration to identify and reach contractor and program office agreement on key system engineering tasks. Figure 5 illustrates the prime objective of a SEMS is to improve the technical integrity of the development program by:

- 1) Reducing development risks.
- 2) Instilling design discipline.
- 3) Providing event oriented, progress based decision criteria.

When implemented on a program, SEMS provides a contractual, technical events oriented "schedule." It identifies key system engineering tasks, their interrelationships with the program milestones and schedule, and the specific criteria to be utilized to track and measure successful task completion. The successful completion of the identified tasks and/or risk reduction activities is requisite to passing design decision points, program decision milestones, and/or contract demonstration milestones. The SEMS is developed by the contractor, delivered with his proposal, negotiated with other contractual documents if required, and generally implemented as a

- **Systems Engineering Master Schedule - A Contractual Technical Events Schedule Which Identifies Technical Tasks That Must Be Successfully Completed To Pass Identified Technical Demonstration Milestones**
 - ✓ The SEMS Is Developed By The Contractor
 - ✓ Delivered With The Proposal
 - ✓ Negotiated During Source Selection
 - ✓ Implemented As A Contractual Annex To The SOW

- **Provides Quantitative Technical Input Into Program Decision Points**

Figure 5 - SEMS What Is It?

contractual annex to his statement of work.

The SEMS concept also enhances the team approach to integrated product development. It provides the upfront planning and integration to define all diverse specialty tasks and events that must be successfully completed to meet user needs. It also provides the top-to-bottom traceability from user needs, through the statement of work task definitions, through the tailored Mil-Prime specifications, and ultimately to the integrated system development activities. The negotiated SEMS is a critical risk management tool. When tied to technical reviews and program demonstration milestones, it provides the objective yardsticks that focus on the accomplishment of critical development tasks and the quality or success of their execution. The ASD Commander has directed

that Acquisition Strategy Panels and Acquisition Review Teams address the use of SEMS along with proposed demonstration milestones on all new ASD development programs.

Some examples of technical tasks that might be candidate activities for a SEMS are reflected in Figure 6. This example is in no way intended to serve as a checklist. It merely illustrates some of the tasks and events that would likely have to be successfully accomplished to pass a particular milestone. Typical guidance can be found in guidance documents such as Mil-Std-1521B, Technical Reviews And Audits For Systems, Equipments, And Computer Software. The requirement for an integrated team approach is visibly reflected by the wide variety of tasks. A properly developed SEMS will reflect the interrelationships, interfaces, etc., required by all members of the development team: hardware and software design engineers; supporters and maintainers; integrated test team; manufacturing; cost/schedule personnel; et cetera.

Assume one is developing a system that includes an air vehicle as one of its major elements. User operational requirements, in turn, require some sort of a landing gear subsystem — not what type, though! The program tailored Work Breakdown Structure (WBS) Dictionary would identify a statement of work paragraph which includes the tasking to design, develop, and qualify a landing gear subsystem. The Instructions To Offerors (ITO) portion of the Request For Proposal would have related text that might read something like: “The SEMS shall include all the major events and associate success criteria which address the design process for each major element of the landing gear subsystem, its integration into the air vehicle, and its

(tasks, events, etc.) such as developing the preliminary design definition, new materials characterizations required, component testing to be accomplished, hardware qualifications, etc., and their relation to specific contractual events and milestones such as PDR and CDR would be defined. The criteria and metrics to be used to measure and track design progress to successful completion of each specified task would be clearly defined in related text. Additional non-contractual detail, at the next level of indenture, might also be presented. It might reflect tasks fundamental to completion of a landing gear preliminary design (the SOP systems engineering stuff). Such information, while not contractual, would provide further insight into the contractor’s planned development activities and his level of day-to-day design development progress tracking. Various interfaces and reviews that are planned at

Significant Accomplishments	Events/Milestones					Accomplishment Criteria
	PDR	CDR	FSD FF	DAB IIIB	IOC	
1. Preliminary Design	X					a. Duty Cycle Defined b. Preliminary Analysis Completed/Reviewed - Tires - Struts - Brakes c. Preliminary Drawings Released - Tires - Struts - Brakes
2. Material Characterization	x					a. } Criteria
3. Final Design		x				a. }
4. Component Tests		x				a. }
5. Hardware Qualification			x			a. }

Figure 7 - SEMS Contractual Tasks

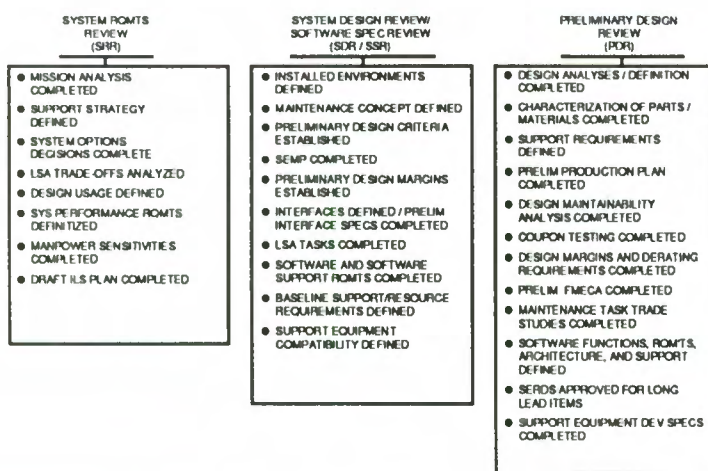


Figure 6 - Example Technical Tasks

interfaces with other system elements.”

The contractor’s proposed SEMS might have a tabular format similar to Figure 7. Significant accomplishments

the subcontractor and vendor might also be shown.

There is no prescribed best method to document a SEMS. Figure 8 depicts another approach. In this case a “waterfall” diagram is used to present the task activities (circles) that must be successfully completed prior to each Demonstration Milestone (triangle) to make informed program decisions. The details of the progress measurement and success criteria for each contractual SEMS task would be defined in related contractual documents. A key point to mention here is that the “date” for completion of individual tasks/events is not the critical factor. The critical measure is the successful completion of all the identified activities prior to stepping through the Demonstration Milestone. The SEMS must provide adequate details to show the interrelationships of the milestones and task schedules and it must be the basis for all subsequent detailed planning. All supporting plans (Integrity Master Plan, Software Development Plan, System Test Plan, etc.) and each development specification Section 4 verification task must be supportive of and consistent with the SEMS and the Statement of Work.

RFPs and Source Selection

There have been many articles of recent which address a wide variety of issues as they pertain to a very complex acquisition process. One must not, however, lose sight of the Government/Industry team bottom line in that process. The bottom line of that partnership is to develop, produce, and field

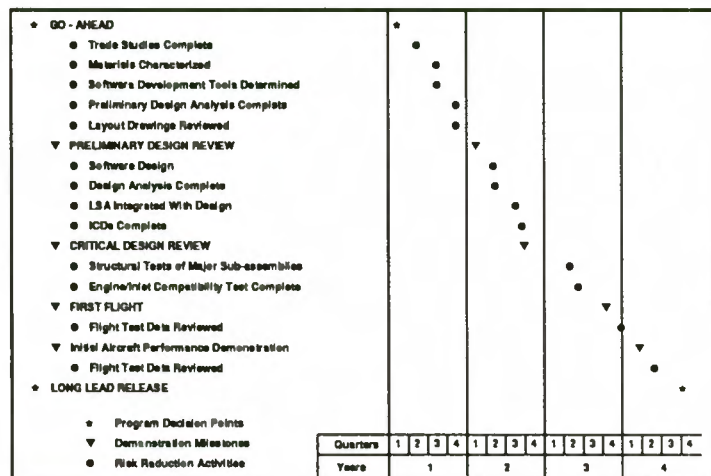


Figure 8 - Another Approach

the most cost-effective weapons systems possible which meet the User's operational needs. The individual contractor tailoring of the generic Mil-Prime documents and development of SEMS that are unique to their design approach encourage innovation and avoid technical leveling. Recent dialogue with industry, however, indicates there are some misconceptions regarding streamlined source selection activities. A fundamental motive of recent legislation and AFSC policy is to emphasize the importance of pre-source selection and draft RFP Government/Industry discussions. The objectives of early discussions are to reduce proposal preparation and evaluation time by improving the quality of proposals and efficiency of the evaluation process.

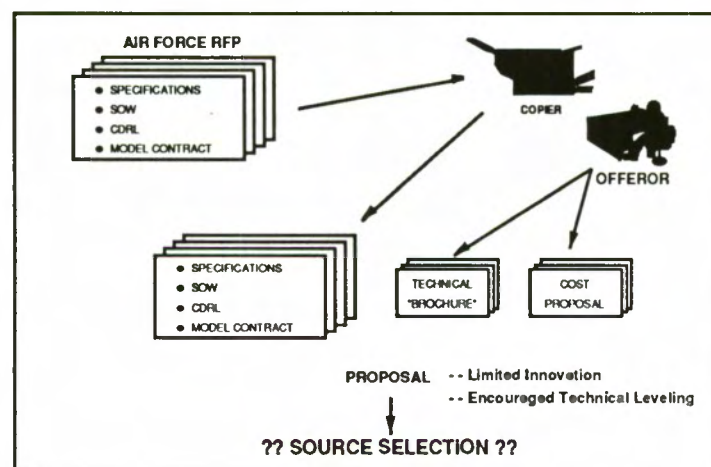


Figure 9 - Historical Perspective

A perspective of past Air Force RFP preparation and source selection process activities is depicted in Figure 9. It is inherent behavior of engineers to deal in details...dot all the "Is" and cross all the "Ts"...leave nothing to chance or assumption. That is, of course, exactly what was done. The Air Force side of the development team actually wrote the detailed, product oriented specifications. They prepared the text for the technical portions of the Statement Of Work, told bidders what documentation was required, and even provided a Model Contract. Not bad....if you were on the proposing side of the equation. As any sane bidder would do, they all said "Yea, we can do that." In essence, they ran the Air Force RFP through the copy machine and only had to prepare their cost and technical proposals. Perhaps an exaggeration to make a point but in a global sense not far from the truth either. The unfortunate results of this approach were technical leveling and limited contractor innovation. Additionally, it left limited information upon which to award the contract... a cost proposal and a technical brochure. Not the optimum information for selecting the proposal which would best meet user needs with minimal development and production risk. A better approach was certainly needed to provide bidding contractors the opportunity to really propose design solutions that reflected their capabilities...good or bad.

Figure 10 depicts the current Mil-Prime approach to RFPs and Source Selections. It emphasizes the "DRAFT RFP" which includes: a Technical Requirements Document (TRD); Instructions To Offeror (ITO); Evaluation Factors for Award; and the frameworks for a Model Contract and Contract Data Requirements List (CDRL). As noted earlier, the objectives of this approach are to improve the quality of contractor proposals and the efficiency of the evaluation process. The cornerstone for attaining these objectives is pre-source selection discussion with timely and effective government/industry dialogue on the draft RFP. Each and every one of the bidding contractors must have the opportunity to submit their best proposal the first time. This, of course, requires a sound understanding of user needs, system operational requirements and constraints, and the evaluation factors to be utilized for award. Bidders can then tailor those Mil-Prime specifications applicable to their design approach, develop their System Engineering Master Schedule, et cetera. They are afforded the opportunity to provide the quality information necessary to accurately reflect their unique design approach and to improve the effectiveness of the source selection team. The Air Force evaluation, using the technical volume as a guide, will focus on the proposed contractual documents as prescribed in the "Factors for Award" section of the RFP. These documents define the offeror's corporate commitment to developing and fielding a system that will meet user needs and operational requirements.

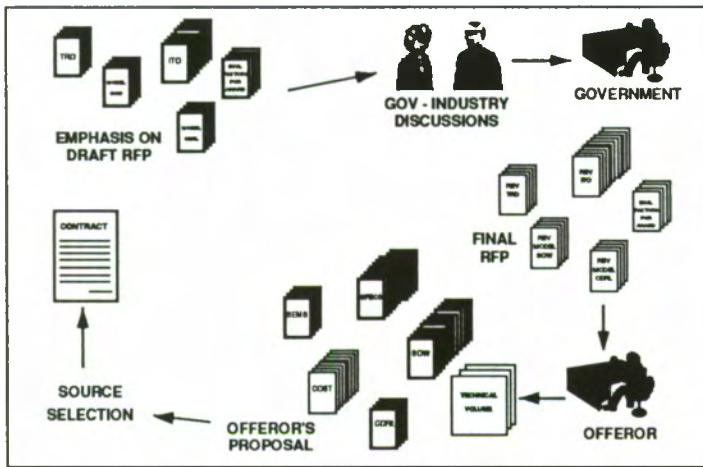


Figure 10 - Current Perspective

The **Technical Requirements Document (TRD)** is prepared by the System Program Office and issued as part of the RFP. It has a mission/operational orientation (per the System Operational Requirements Document and Statement of Need) and only references first tier requirements. It covers the entire system, i.e., prime mission equipment, training system, support system, et cetera. The TRD follows the "Section" categories in AFGS-87253 and is to be used by the offeror to prepare their proposed system specification.

The **Instructions To Offerors (ITO)**, Section L of the RFP, provides concise, and complete direction to the offeror regarding developing their SOW, SEMS, Specifications, CDRL, etc., which must clearly define their proposed design approach. It identifies topics the offeror must provide and discuss; e.g., integrity program tailoring, design integration of system supportability, manufacturing, maintainability, manpower, personnel, training, diagnostics issues, et cetera.

The **Evaluation Factors For Award**, Section M, provides definition of specific criteria and key performance parameters to be assessed during source selection. Basic criteria would include understanding the operational needs, soundness of design approach, and compliance with system requirements.

The **Model Statement Of Work (SOW)** provides the fundamental program framework and outline of top-level tasking. The offeror must expand this framework with detailed task descriptions appropriate to their design approach.

The **Model Contract Data Requirements List (CDRL)** would define the minimum data needed to conduct the program and require general access to contractors working data.

As emphasized in the ITO, the source selection technical

evaluation and rating will be based primarily on the information contained in the proposed contractual documents. The technical volume will be used as a guide to understanding the offeror's design approach and as a roadmap to locate definitized activities within the proposed contractual documents. The contractor's proposed activities to design, develop, produce, and field the entire system will be definitized in:

- 1) The specifics of integrated tasking proposed in the SOW.
- 2) The proposed SEMS key tasks and measurement criteria for completing each proposed major program milestone.
- 3) The system specification that establishes the functional baseline which meets the TRD, how those requirements will be verified, and the flowdown of those requirements into subsystem and prime item development specifications.
- 4) The proposed CDRL, availability and access to contractor design decision data, and sub-contractor information.
- 5) The recurring and non-recurring engineering activities which form the basis for the technical portion of the offeror's cost proposal.

A lot of subjects and their integrated use in system development activities at ASD have been presented. A review of the key features of each element might be helpful.

The Deputy for Engineering Mil-Prime approach to generation of specifications and standards embraces a development orientation vis-a-vis a product orientation. The products attained are generic acquisition documents that represent a best starting point for tailoring development documents to a specific program application. The tailored documents, in turn, reflect the performance characteristics of the product the User needs to satisfy his operational needs. The Mil-Primes also encourage innovative, multiple design solutions from bidding contractors while controlling tiering of reference documents. A most important feature of these documents is the one-to-one correlation of measurable verification procedures for each Section 3 requirement. The DoD and Industry corporate histories have been retained in a non-contractual "Lessons Learned" appendix handbook to assist in the tailoring process for program specific applications.

AFGS-87253 provides basic format and content guidance to developers of system specifications for translating User needs into operational performance requirements. The translation, via the AFR 57-1 process, is structured to User operational needs, operational environments, system integrity requirements, and system constraints. The translated user needs must be: measurable during design development and test; achievable in terms of performance, cost, and schedule; and maintainable per the support and maintenance strategy.

The document reflects strong emphasis to make all elements of User requirements (resources, training, operation, maintenance, and support) proactive with the system engineering analysis, synthesis, and trade-off process. In addition to basic Section 4 objectives to define the methods which will be utilized to verify conformance to Section 3 system requirements, Section 4.2 affords the opportunity for in-process measurement and tracking of critical Section 3 requirements. Selected parameters are tracked with key System Engineering Master Schedule tasks and risk reduction activities that are deemed critical to successfully meeting the selected system requirements.

The Systems Engineering Master Schedule Concept enhances integrated product development via the system engineering process. It provides a disciplined, integrated team approach to up-front technical planning, to development of meaningful measures of merit, and to tracking of design progress toward satisfying system requirements. The prime objectives of SEMS are to:

- 1) Minimize development risks.
- 2) Instill balanced design discipline.
- 3) Provide management with event oriented, progress based criteria for making informed decisions.
- 4) Improve the technical integrity of development programs.

The SEMS is that critical risk management tool that, when tied to technical reviews and program demonstration milestones, provides the objective yardsticks that focus on the accomplishment of critical development tasks and the quality or success of their execution. It is developed by the contractor, delivered with his proposal, negotiated with other contractual documents, and generally implemented as a contractual annex to his statement of work. The ASD Commander has directed the development and use of SEMS along with proposed demonstration milestones on all new ASD development programs.

The objectives of enhanced RFP and Source Selection activities are to reduce proposal preparation and evaluation time by improving the quality of proposals and efficiency of the evaluation process. The cornerstone for accomplishing these objectives is pre-source selection discussion with effective Government/Industry dialogue on the draft RFP. A sound, complete understanding of User needs, system operational requirements and constraints, and the evaluation factors to be utilized for award must be shared by all team members. The Air Force evaluation, using the technical volume as a guide, will focus on the proposed contractual documents which define the offeror's corporate commitment to developing and fielding a system that will meet User needs and operational requirements. The technical evaluation will assess the contractor's proposed design approach to meeting key

system performance parameters as discussed in the Instructions to Offerors. The submittal of quality proposals may very well preclude the necessity to "negotiate" with multiple bidders during the source selection process. To be able to award without discussion is an admirable goal and would be a splendid testimonial to the quality of a contractor's proposal.

Summary

The synergistic effect of the corporate integration of tailorable, performance oriented acquisition documents with the SEMS concept and enhanced RFP/Source Selection activities has put ASD back on target. These activities form the critical triad for a more effective acquisition development process which:

- 1) Implements DoD direction while bringing a renewed focus on satisfying User operational needs.
- 2) Provides our contractors with a greater role and flexibility to arrive at innovative designs which are responsive to satisfying User needs.
- 3) Provides the upfront communication of clear system requirements.
- 4) Focuses the technical evaluation on the proposed contractual documents.
- 5) Utilizes a SEMS to provide progress measurement for enhanced management decisions.

The Mil-Prime business approach provides the process and environment to effectively transgress the adversary relationship to form that critical team partnership fundamental to successful development of complex weapon systems.