

DO WE NEED THE STATEMENT OF WORK?

A Radical Argument for Elimination

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For years I taught about statements of work (SOWs) — what they are, how they are prepared by the tasking activity, and how they are utilized to cost, plan and control contractual work by a performing activity. My teaching was based on the premise that the SOW is one of four essential technical documents provided by the tasking activity in a request for proposal (RFP) and the basis for work to be accomplished under contract. The other three complementary technical documents included in my instruction are specifications, contract data requirements lists (CDRLs) and a work breakdown structure (WBS).

I assumed the SOW is essential to the work effort and that without it the performing activity couldn't do the contractual effort, or the tasking activity couldn't know and monitor what the performing activity was doing. I long recognized that SOWs are poorly prepared and that, in spite of this, contractual efforts are generally accomplished to tasking-activity satisfaction, albeit with cost overruns and schedule delays.

Recently my paradigm on the SOW was challenged. During a class I taught on systems engineering trends in a Defense Systems Management College Executive Management Course,

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a senior executive asked, "Why can't we do away with the statement of work?" He went on to assert, "It isn't needed!" This came at me from left field. It was outside the box! I therefore easily dismissed it with standard rhetoric. After all, isn't the SOW to the acquisition world what the Bible is to the Christian world?

The question of need and value, however, became ubiquitous. With each successive class on systems engineering, the question pursued me as I taught the essentials and merits of the SOW according to the book (MIL-HDBK-245C). This led me to play devil's advocate and challenge students to think about the need for a SOW. Like I did, each class defended the existence and value of the SOW. Performing activity contractors have been particularly outspoken in support of the need for a SOW.

Reflection on the challenging statement from the senior executive has led me to a different conclusion, however. The purpose of this exposition is to explain why I now teach that the SOW is a redundant document and not needed, in its present form, by the tasking activity or the performing activity to accomplish the work associated with a contract.

I realize that such a position is against conventional wisdom. But, in this era of acquisition reform, a fertile ground exists for such a contrary seed to grow and bear fruit. Therefore, with vigor I attack the windmill. I challenge you to reflect on the arguments

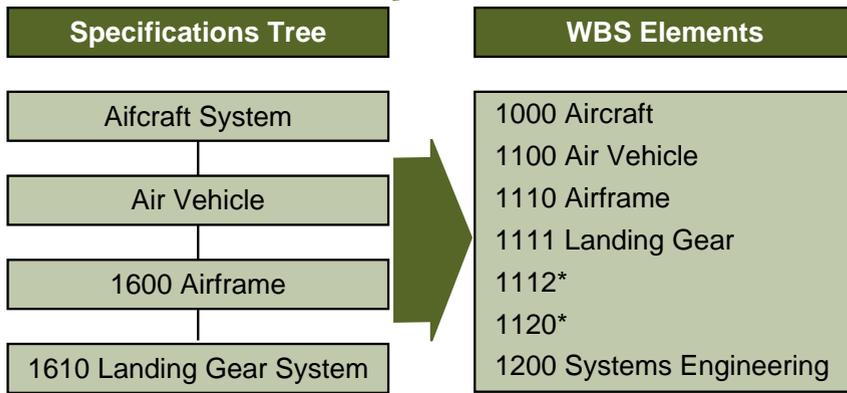
made in this paper. Look into the deep of each provoking rationale provided. Don't dismiss the challenge early. An opportunity may be missed to reform acquisition and cut out time delays, confusion and unneeded costs. Adopting the radical thoughts offered herein may actually lead to quality systems being realized within cost and schedule goals and without the excessive change costs associated with today's acquisitions.

Identify the Expert

Who is the expert in doing the contractual work? Is it the tasking activity or the performing activity? Your answer ought to be the performing activity. They get the contract because the expectations of the tasking activity include the fact that the performing activity provides the experts to not only do contractual tasks but also to define what those tasks are and how they will accomplish them.

The main function of the SOW boils down to telling the performing activity what to do. A fair question is "To do what?" Usually this is provided to the performing activity in Section I of the SOW — Scope. This section is nonbinding. It is intended to provide to the performing activity a word picture of the purpose of the contractual endeavor. It may be as simple as to develop, fabricate, assemble, integrate and test a "Fuzzy Whopper," or some similar product. Then, in Section II of the SOW, the tasking activity provides the list of reference documents for guiding the performing activity in accomplishing

FIGURE 1. WBS Development



the work related to the contract. In this controversial and misunderstood section, work is constrained, further defined, and often tiered through a maze of multiple documents referenced by those listed. Usually, the work directed through these documents is not intended by the tasking activity, but is included as a result of the unfamiliarity by SOW preparers.

The tasking activity is generally unfamiliar with how or what to tailor out and how to prevent tiering. A misunderstanding exists about where the tailoring is accomplished. Many practitioners, who have not read MIL-HDBK-245C, tailor the documents, if tailored at all, in Section II. The handbook calls for tailoring to be done in Section III. [Authors note: Since writing this article, Dr. Perry's announcement in June 1994 restricts the use of most, if not all, specifications and standards in an RFP. This will mitigate, to some extent, the tiering problem. It will also cause the tasking activity to rely on the experts — the contractors — to determine which specifications and standards to apply to the contractual effort.]

The third section of the SOW is the most important. It details the nonspecification work the performing activity is required to accomplish. This is the section most often poorly prepared by the tasking activity. I have seen several Sections III obviously copied from other program SOWs. Evidence at the trivial end includes

the name of other programs. Evidence at the nontrivial end includes work intended for an entirely different acquisition phase or level of development. This later occurrence leads to interesting and creative responses in performing activity proposals.

The MIL-HDBK-245C acknowledges the problems found in Sections II and III of the SOW by including numerous cautions to which tasking activity preparers should pay heed. Unfortunately, surveys taken in numerous systems engineering classes find that few government taskers used MIL-HDBK-245C in preparing past SOWs. In fact, few knew of the existence of a handbook that would aid in SOW preparation.

In 1990, Adler and Andrews waxed eloquently on the problems associated with SOW development. They presented survey results that highlighted the poor quality of SOWs and the lack of awareness of MIL-HDBK-245 and its requirements.

Of course, the fact that SOWs are not well-prepared, or that the experts are not the preparers, is not sufficient rationale for doing away with the SOW. For these reasons, SOW classes are held for acquisition personnel. For example, in a follow-up article to their provocative 1990 writing, Andrews and Adler, in 1991, posed the question, "Is the SOW as important as it has been made out to be?" Their conclusion was "they think so."

They stressed that education is the key to fixing SOW efficiencies. (Unfortunately, they never did an analysis of the need for a SOW.)

Although not sufficient for doing away with the SOW, such observations point out the reality that SOWs have not played a major role in leading to quality system developments. Performing activities seem to do the right things in spite of poor SOWs.

Some students have contended that they realize the performing activities are the experts, so they have that activity prepare the SOW during an earlier contractual effort for a future, follow-on contractual effort. Such an argument creates another question. "If the performing activity is going to tell the tasking activity what work that they must do to accomplish a development effort, why bother with a SOW at all?"

Why a SOW Is Not Needed

Arguments on why a SOW cannot be eliminated usually rest on the need to cost the work and to track the performance progress of the work. At first this seems valid, until one appreciates and understands what is included in, and directed by, the other three technical documents included in a contract and/or an RFP, and what future standards on systems engineering impose to ensure that lengthy SOWs will not be missed. Each document will be explained separately. However, one must appreciate that without the synergism of all these documents, the work usually included in a SOW will not be accomplished, let alone be satisfactory. The documents of the RFP/contract must be prepared so all directions work together toward the desired contractual objectives.

Specifications

The main purpose of a development is to create products and their associated processes that meet or exceed customer and public expectations. The primary purpose of a speci-

fication is to relate to the performing activity exactly what the system (product) must do and its characteristic attributes; included is how each requirement will be qualified.

When functional and physical requirements are allocated to specific elements of the physical architecture, a specification tree is generated. This specification tree reflects the interrelationship of performance and physical requirements, and provides a construct for the development of the product part of a WBS. Figure 1 illustrates the relationship between specifications and the WBS.

Specifications have been specifically excluded from SOWs (except for Type 0 and Type IV SOWs when needed to guide concept development or specific services, respectively). Therefore, a SOW is not needed to provide performing activities work requirements related to product performance and characteristic attributes.

Work Breakdown Structure

The products identified in the product part of the WBS must be developed to satisfy the operations func-

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tion of the system. Associated processes — systems engineering and integration (development), manufacturing, support (to include distribution/deployment, disposal and support equipment), verification/test, and

training — are added to the product structure to reflect the hierarchical family tree of products and process that make up the system.

With the addition of program management concerns (program management, spares, data, etc.) of MIL-STD-881B, the resulting WBSs include all technical and management work, which the performing activity is required to complete. When generated for the appropriate level of development, program and contract WBSs reflect the products, processes and services that must be developed and provided by performing activities or supplied by the tasking activity.

The key element of the WBS which challenges the need for a SOW is the WBS dictionary. A typical WBS dictionary is provided in Figure 2. Generated during the prior level of system development and provided to the performing activity in the RFP, this dictionary provides the performing activity with the tasks needing completion with respect to a particular WBS element.

In my SOW instruction, I stress that the task of writing a SOW paragraph should not be difficult if the task description from the dictionary is included in the SOW. Thus, the SOW becomes a collection of WBS dictionary task statements. Looking back from my new vantage point, one of challenging the need for a SOW, I see the need to question why a SOW is necessary to repeat statements already available to the performing activity. Of course, this means a tasking activity needs to have a fully developed WBS for engineering the system and managing the system development, complete with the WBS dictionary, in the RFP.

Contract Data Requirements List (CDRL)

As work is performed to develop a product or process to meet specifications associated with a WBS element, data is generated. Decision

FIGURE 2. Example WBS Dictionary

Work Breakdown Dictionary								
Index Item No. 2		WBS Level 2		CONTRACT NUMBER F33657-72-0923				
WBS Element		WBS Title AirVehicle		Contract Line Item: 0001, 0001AA, 0001AB, 0001Ac, 0001AD 0001AE, 0001AF, 0001AG, 0001AH				
Date	Revision No.	Revision Auth	Approved Chg					
Specification No. 689E078780028	Specification Title: Prime Item Development Specification for AGM 86A Air Vehicle/Airframe							
Element Task Description			Cost Description					
Technical Content The air vehicle element task description refers to the effort required to design, develop, fabricate and test the airframe segment, propulsion element, and fire control element, and to the integration assembly and check-out of these complete elements, to produce the complete Air Vehicle. The lower level elements included and summarized in the Air Vehicle element are: Airframe Segment (A11100), Propulsion Segment (A32100), and Fire Control Segment (A61200).			<table border="0"> <tr> <td><u>MPC/PMC</u></td> <td><u>Work Order/Work Auth</u></td> </tr> <tr> <td>A10100</td> <td>See lower level WBS Elements</td> </tr> </table> Cost Content - System Contractor The cost to be accumulated against this element include a summarization of all costs required to plan, design, develop, fabricate, assemble, integrate and perform development testing, analysis and reporting for the air vehicle. It also includes all costs associated with the required efforts in integrating, assembling and checking our GFP required to create this element. <u>Applicable SOW Paragraph:</u> 3.6.2		<u>MPC/PMC</u>	<u>Work Order/Work Auth</u>	A10100	See lower level WBS Elements
<u>MPC/PMC</u>	<u>Work Order/Work Auth</u>							
A10100	See lower level WBS Elements							

makers require the information provided by this data to assess development progress and the quality of work performed. The CDRL tells the performing activity which data products are to be prepared and delivered to the tasking activity. Although MIL-HDBK-245C allows a CDRL, or the associated data item description (DID), to be referenced in a SOW paragraph (CDRL and/or DID number placed in parentheses at the end of a SOW paragraph), a request for, or discussion of, data is not allowed in a SOW paragraph. This is because (1) CDRLs are provided as a separate list in Attachment J of the Uniform Standard Contract format used for the RFP and contract, and (2) the labor and material costs associated with generating and delivering data should not be priced out twice — first as a CDRL item and again in a SOW paragraph.

Thus, since the CDRL directs delivery of needed data items, the SOW is not needed for data development. The performing activity knows that if it must be delivered, it must be prepared in accordance with the CDRL and appropriate DID.

If cross reference of data items is needed, this can be accomplished by adding referenced WBS element numbers to the CDRL or adding CDRL/DID references in the WBS element dictionary form.

The existence of specifications, CDRLs and WBS dictionary tasks in the RFP/contract are not sufficient to justify eliminating the SOW as structured today. Additional information is necessary. That information is found in the Systems Engineering Management Plan (SEMP) and the Systems Engineering Master Schedule (SEMS) requirements of two proposed industry standards on systems engineering, and currently used in most Air Force program developmental efforts. When prepared by the performing activity, these two planning documents are structured to facilitate their applica-

tion contractually as an alternative to placing a standard on contract to execute systems engineering. These documents allow the performing activity (the real experts) to detail the work they will accomplish during the next contractual phase.

Systems Engineering Management Plan (SEMP)

The SEMP is intended to coordinate and integrate all technical plans and planning.

The forthcoming industry systems engineering standard, to be published by the Electronics Industry Association, recommends that a tasking activity prepare a SEMP to describe tasking activity systems engineering activities for the next contractual phase. The U.S. Air Force also requires it. Specifically, the tasking-activity SEMP provides responsibility for key systems engineering activities (by tasking activity or performing activity); plans and criteria for transitioning critical product and process technologies; identification of key trade studies and system effectiveness assessments; technical risk management plans; and tracking requirements for identified critical technical parameters. The tasking activity should provide this SEMP, in part or total, to the performing activity for use in proposal preparation.

The performing activity SEMP is to be prepared to respond to the tasking activity RFP. With the tasking activity SEMP as a guide, the performing activity SEMP describes the integrated set of WBS dictionary tasks. The SEMP prepared by the performing activity includes a summary, with reference to detailed plans, for all technical plans required by the CDRL of the RFP. The negotiated SEMP may then be placed on contract as the technical part of the SOW.

Systems Engineering Master Schedule (SEMS)

The SEMS is an event-based, not calendar-based, schedule/plan that

includes a compilation of key accomplishments requiring successful completion to pass identified events. Events include technical reviews and audits, demonstration milestones, and decision points. The tasking of these events is normally included in a SOW.

Like the SEMP, a tasking-activity prepared SEMS is recommended in the forthcoming EIA Interim Standard 632 on systems engineering (a tasking-activity SEMS is required for Air Force programs). The tasking-activity SEMP should include top-level events throughout the entire program and detailed information for the next contractual phase.

Tasking-activity SEMS information should be provided to the performing activity in the RFP to establish major events and accomplishments which the providing activity would need to complete.

The providing-activity SEMS would be prepared as a response to the RFP, and submitted as part of the proposal. The performing activity's SEMS describes how the SEMS tasks are to be accomplished.

What Needs to Be Done

Obviously a Service program cannot eliminate the SOW unilaterally. Since it is part of the Uniformed Standard Contract Form (Section C), an RFP would not be released without a completed SOW. However, for commercial applications, the substitute documents outlined above can provide a basis for directing work without repeating WBS dictionary task statements in a separate SOW document.

For military procurements, contracting officials would most likely frown on the disappearance of the SOW. Being a realist, I do not recommend elimination of the SOWs. However, one can still take advantage of the documents described above.

The recommendation is that the SOW for system definition and sub-

system development be reduced. Sections I and II may continue to provide the scope of the effort and references applicable for the contractual effort. (References would need to be tailored in the WBS dictionary task statement.) Section III should be reduced to read as follows:

The contractor shall develop, conduct, provide and control the engineering and management effort in accordance with the provisions of the attached WBS dictionary tasks, CDRLs, and negotiated SEMP and SEMs.

For management tasks not included in the above documents, the recommendation is that the business plans included in management planning documents be used (e.g., the U.S. Army Program Management Plan or the Air Force Integrated Management Plan and Integrated Master Schedule).

Conclusions

Current SOWs are redundant, not well-prepared, and lead to confusion and inefficiencies in providing high-quality products and services with correct performance features at an affordable price and on time. The time for acquisition reform is now. One place to start is with the SOW.

This exposition challenges the conventional wisdom which dictates that a SOW be utilized to guide the performing activity in a contractual effort. Reform in acquisition requires a challenge to this thinking. I have asserted that a lengthy SOW is no longer needed. I have justified this assertion for acquisitions that have a specification, WBS, and CDRLs, and that require a SEMP, with an accompanying SEMs. The synergy of these documents, with other management documents and plans, provides necessary and sufficient information to guide performing activities in accomplishing a contractual effort, and to provide enough information to tasking activities to track and assess an effort.

The existence of specifications, CDRLs and WBS dictionary tasks in the RFP/contract are not sufficient to justify eliminating the SOW as structured today.

Radical ideas often create entrenchment by those who want to protect established and conventional methods. I challenge you to reflect on the arguments presented herein. I trust that such reflection will alter your

mind-set on the need for a lengthy SOW associated with a contractual effort for development of a system, large or small, new or incremental. Where my logic has holes in it resulting from my lack of knowledge, don't prematurely throw away the ideas initiated herein. To my arguments, add your ideas and any needed documents available to the program office to help reduce the need of, and reliance on, lengthy SOWs.

Finally, until management directs the radical change encouraged herein, perhaps as you prepare your next SOW you will reflect on this article. Remember to flow the SOW from the WBS, use MIL-HDBK-245 as a guide, and tailor references in Section III. We just might get better SOWs.

(Previously published in the Proceedings of the 4th Annual International Symposium of the National Council on Systems Engineering, August 1994.)

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