
A tabular format approach to

Service contract writing

By **DANIEL L. EVEREST, JR.**
STEPHEN D. BLANCO
and
STANFORD B. C. YUEN, P.E.
Industrial Engineering Branch
Pacific Division
Naval Facilities Engineering Command
Pearl Harbor, Hawaii

If necessity is the mother of invention, then necessity has once again given birth — in this case, to a new contracting tool. Engineers at the Pacific Division (PAC-DIV), Naval Facilities Engineering Command (NAVFAC), Pearl Harbor, were faced with the monumental task of updating and revising a complex performance work statement (PWS) covering 25 diverse functions, from food services to port and harbor services. In response to the challenge, the specifications writing team formulated an innovative contract format which presented the contractual requirements in logically arranged tables. The result was a PWS that was complete, comprehensive, readable, and orderly so that contractors, customers, and contract administrators can easily locate and understand the contractual requirements.

The new contract format was developed for base operating support (BOS) services on Diego Garcia, a remote but strategic island in the middle of the Indian Ocean. The BOS contract is the largest in the Navy, with approximately 1,600 contractor personnel. The initial contract was awarded in 1983 using a cost-reimbursable form of contract with a fixed target and cost-sharing for under-runs and overruns.

This form of contract was necessary during this period of tremendous growth in terms of the number of facilities and types of services necessary to meet the government's changing and expanding needs. Since the contract will expire in September 1988, efforts to resolicit the contract were initiated early to ensure adequate time to plot necessary changes and to measure their impact. The change in the PWS format from narrative to tabular has already improved understanding of the contract requirements between the customer and the contracting office tremendously.

The resolicitation of the contract could not proceed under the existing form of contract for the following reasons:

- **Contract Type.** The current BOS PWS was written specifically for a cost-reimbursable form of contract using broad and often vaguely described work statements.

Much of this was done purposely to allow maximum flexibility in contract interpretation of the scope of work in order to allow the contractor to respond to emergent and evolving requirements which the government could not define with clarity. Lack of work definition was predominant for the initial solicitation because Diego Garcia was still being built (i.e., \$500 million military construction over five years) and historical perspective was absent. Under a cost-reimbursable form of contract, a loosely defined PWS works well; however, PACDIV was directed by NAVFAC to convert to a fixed price with award-fee contract during the resolicitation, and thus the entire PWS needed to be revised and defined to a much greater level of detail.

- **Information for Bidders.** After several years of operation, enough historical data is available for prospective contractors to adequately prepare their bids. The trouble is, how do we best display this information to them?

- **Quality Assurance (QA) Plans.** Shifting to a stricter contract type and adding schedules of deductions places an even greater responsibility on the shoulders of the Diego Garcia quality assurance evaluators (QAEs). Therefore, better, more detailed QA plans must be developed for them to follow.

- **Award Fee.** Because the contractor can earn additional periodic compensation based on quality, cooperativeness, responsiveness, and other performance criteria, he or she needs to know the minimum levels of performance to avoid unsatisfactory ratings and maintain eligibility for award.

So how does the government respond to major changes of this nature? This is a large contract, one with 25 functional annexes encompassing harbor operations, air operations, and everything imaginable in between!

The Diego Garcia specification writing team developed an imaginative solution to their contract evaluation which not only takes care of Diego Garcia but also may have far-reaching impact on other contracts as well. We call it tabular formatting.

Here's how it works.

- Every annex in the BOS contract covers a different functional area, i.e., utilities, stevedoring, billeting, etc. Therefore, treat each annex as a separate PWS.

- Standardize the format for each annex (PWS) — rigidly! Let the flexibility come in the requirements, not the format. What is the best format? A good start is to place requirements into one of three categories:

1. Informational/general
2. Yes/no evaluation
3. Evaluation based on measurement

Note the word "evaluation" in the second and third

categories. Whose "evaluation"? The QAE's. Writing a PWS in tabular format makes the specification writer think like a QAE and the prospective bidder think in terms of being evaluated. Not a bad idea!

But what do these categories mean? First, some requirements are so general they are more informational than true requirements. An example is "perform custodial services for Diego Garcia." (Try making a deduction stick on that one!) However, these "requirements" are necessary to the introduction of an annex or PWS (provided there aren't too many of them).

Next are the yes/no requirements — those the contractor either has or has not met. Personnel qualifications fit well into this category. The employee either has the required certification of competency, or . . . well, you get the picture.

Finally are the requirements needing some type of measurement (or in the worst case, judgment) to determine satisfactory completion. The majority of contract technical requirements fall into this category.

How do we treat these categories?

- Develop a format best suited to each category type. Obviously, general or "yes/no"-type requirements can be described using short, simple statements. They are found in each annex of the Diego Garcia (DG) BOS in standard PWS paragraph format. Following is an outline of the "standard" requirement types:

OUTLINE OF PARAGRAPHS A AND B DIEGO GARCIA BOS CONTRACT PWS

Paragraph No.	Description
A.	General Requirements
A.1	Scope of Work
A.2	Definitions
A.3	References
A.4	Safety Provisions
A.5	Description of Existing Conditions
A.6	Hours of Operation
B.	Personnel Qualifications

This takes care of the general and yes/no-type requirements. But what about contract requirements needing measurement, inspection, and judgment to determine if they have been successfully completed? Using the standard PWS paragraph format, these may get the message across to the contractor in a legally defensible manner, but formulating QA plans, building schedules of deductions, or figuring out what is expected of the contractor can be difficult in this format.

With this in mind, the DG BOS specification writing team set out to establish a format that would meet the

ITEM NO.	MAJOR CONTRACT REQUIREMENT	RELATED REQUIREMENT OR INFORMATION	ESTIMATED QUANTITY	PERFORMANCE STANDARD
16.C.2.c(2)	Perform all required maintenance and repair of the airfield arresting gear and appurtenances.	Instructions are outlined in NAVAIR 51-5-31, Section VII, PMS letter of Promulgation (AIR 53721C.54:HAT) of Sep 1971 and Maintenance & Material Management (3-M) Manual OPNAVINST 4352.	One E-28 arresting gear.	Same as for 16.C.2.c(1).
16.C.3	HARBOR OPERATIONS			
16.C.3.a	Pier Standby. Provide pier standby, as required by the Government.	Nothing additional.	14 requests per year.	100% of pier standby requests met.
16.C.3.b	Testing. Test fire hose on tugs and ships as required or requested by the Government.	Nothing additional.	1 request per year	100% compliance with required/requested tests.
16.C.4	FIRE PREVENTION/PROTECTION INSPECTIONS			
16.C.4.a	Provide full-time fire prevention inspectors to perform fire safety inspections of all structures and outside storage areas in accordance with NAVMATINST 11320.14 and the plan as provided to the Government in paragraph 16.F.3 and outlined as follows:	Prepare applicable reports noted in paragraph 16.F.10.	As approved by ROIC.	At least 95% of inspections completed on time. 100% of discrepancies corrected within 7 working days.
16.C.4.b	Buildings and Grounds. Perform a monthly fire prevention inspection of all buildings and grounds in accordance with NAVMATINST 11320.14.	Inspection will include all of Diego Garcia and will include all conditions and practices related to fire safety.	1,234 buildings. 1.5M sq ft of building space. 7,000 acres of grounds.	100% of buildings and grounds inspected monthly.
16.C.4.c	Industrial Areas. Perform a weekly fire prevention inspection of all industrial areas in accordance with NAVMATINST 11320.14, enclosure (2), para. 2.n.	Inspection frequency shall be commensurate with the hazard. Alleviate all fire and explosive hazards discovered during inspection.	See map of Industrial Areas.	100% of fire and explosive hazards identified and alleviated.
16.C.4.d	Recreational Facilities. Perform fire prevention inspection of recreational facilities at closing time in accordance with NAVMATINST 11320.14, enclosure (2), page 4, paragraph 2.1 and OPNAV NOTICE 11320.	Alleviate all fire hazards discovered during inspection.	9 recreational facilities.	100% of inspections conducted and hazards alleviated.
16.C.4.e	Area Fire Marshall Inspection. Correct all discrepancies resulting from the Area Fire Marshall Inspection and provide to the Government a written plan describing what actions will be taken to prevent the discrepancies from reoccurring.	Inspection conducted in accordance with DODINST 6055.6, NAVMATINST 11320.15, NAVAIR 00-80R-14 (NATOPS) and NAVMATINST 11320.12 series. Inspection covers overall operations including emergency drills and an inspection of records, reports, facilities and the technical library.	Approximately 1 inspection per 18 months.	100% of correction made within 30 days of inspection. Written discrepancy correction plan submitted within 30 days of inspection. 0 instances of corrected discrepancies reoccurring.

TABULAR FORMAT — Sample Page from Diego Garcia BOS Draft PWS (Subject to Review)

Excerpt from PWS

following criteria:

- Reads easy to government and contractor personnel alike
- Provides a foundation for QA plans and the schedule of deductions
- Allows inclusion of historical data in each requirement to assist contractors in preparing their bids
- Provides the necessary standards for government and contractor to determine level of performance

The team concluded that only requirements written in tabular format would meet this criteria. The idea came from NAVFAC MO-327, *Service Contracts: Specifications and Surveillance Manual*, where a tabular format was used to develop the performance requirements summaries. Once writing the requirements in table form were agreed to, developing the actual format to be used for the Diego Garcia PWS was relatively simple. On the previous page is an excerpt from the actual PWS.

As can be seen, this is quite different from the standard PWS! Essentially, all requirements in this format have become independent contract line items, each consisting of five key components. A brief description follows:

1. **Item number.** Self-explanatory.

2. **Major contract requirement.** A short and simple subject/verb/object statement which describes basic contractor responsibility. In the standard PWS format, the major contract requirement most likely would have appeared as the first sentence in a paragraph describing and explaining a series of related requirements. It often began with, "The Contractor shall . . .," a phrase the specification team felt was cumbersome, unnecessary, and worthy of elimination whenever possible.

3. **Related requirement or information.** Almost every major contract requirement has a need for supporting information which further describes and explains the requirement. It often contains related requirements (example: if the major requirement is to provide a water sample, a related requirement may be the address to send it to or a description of the conditions under which it should be taken).

4. **Estimated quantity.** Historical data or scope estimates go here, as do work performance frequencies and number of items to be serviced. This information helps bidders determine the resources needed to perform the requirement. Obviously this information also will be useful in determining QAE staffing levels.

5. **Performance standard.** Minimum acceptable level(s) of performance for the requirement go here. Why give this information to the contractor? Will the level of performance drop once the acceptable levels are known? For the DG BOS contract, the answer is no. The contractor is still responsible for 100 percent performance, and rework will be required in cases where 100 percent is not met. Also, deductions will be made for work not performed or work performed in an unsatisfactory manner and not corrected. With this contract, however, it is also the government's intent to let the contractor know whether or not his or her work is satisfactory. The information will be particularly useful in determining the con-

tractor's award fee on a quarterly basis, and will also be useful in forming QA plans.

Once you know how to break requirements into their component parts, the only thing left is putting them in logical order. The following is the outline of the "tabular format" requirements used for one annex of the DG BOS contract:

SAMPLE OUTLINE OF TABULAR FORMAT REQUIREMENTS DIEGO GARCIA BOS CONTRACT

ANNEX 16 CRASH AND FIRE PROTECTION SERVICES

Paragraph Description

- C. Performance Requirements
 - C.1 Executing Planned Requirements
 - C.2 Air Operations
 - C.3 Harbor Operations
 - C.4 Fire Prevention/Protection Inspections
 - C.5 Fire Protection Systems and Equipment
 - C.6 Fire Alarm Systems
 - C.7 Burning, Cutting, and Welding Operations
 - C.8 Facilities, New Construction and Alteration
 - C.9 Training
 - C.10 Fire Hydrants
 - C.11 Crash/Fire/Rescue Vehicles
 - C.12 Fire Extinguishers
 - C.13 Fire Investigations
 - C.14 Communications
 - C.15 Fire Drills
 - C.16 Warning Signs
 - C.17 Attire
 - C.18 Housekeeping
 - C.19 Reference Library
 - D. Watch-standing Requirements
 - D.1 Crash/Fire/Rescue Apparatus Manning
 - D.2 Watch-standing Personnel
 - E. Time and Materials Requirements (None)
 - F. Records and Deliverables
 - F.1 Management Program
 - F.2 Fire-fighting Operations Pre-plans
 - F.3 Fire Safety Inspections Plan
 - F.4 Fire Protection Systems Inspection Plan
 - F.5 Discrepancy Reports
 - F.6 Structural Fire Reports
 - F.7 Fire Message Report
 - F.8 Recall Plan
 - F.9 Daily Staffing Report
 - F.10 Administrative Files
 - F.11 Other Reports
 - G. Materials, Equipment, and Facilities
 - G.1 Government-furnished Material
 - G.2 Government-furnished Equipment
 - G.3 Government-furnished Facilities
 - G.4 Contractor-furnished Materials
 - G.5 Contractor-furnished Equipment
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Tabular formatting — more than a one-shot solution

continued from preceding page

This is the tabular format — a listing of contract “line items” broken into components, each meeting a specific criteria. And because all the requirements are in line-item format, we can now begin preparing QA plans and schedules of deductions based on individual requirements as opposed to working with paragraphs, each containing several “buried” requirements.

This format doesn’t look much like a standard PWS. It does meet all of the DG BOS contract criteria, however, as well as the criteria for many other types of contracts. This concept has many advantages over the “old” format even on other applications. The advantages include:

- **Easy to Use.** It’s easy to read and easy to modify, especially in a large-scope contract where modifications occur due to constantly evolving government needs. The tabular format allows requirements to be added, changed, or removed without major rewrites, reducing the possibility of interpretation and simplifying the negotiation process.

This format also simplifies and improves specification writing. A contract of this magnitude involves input from many different sources, particularly technical experts with little or no PWS writing experience. The tabular format provides a standardized guideline which requires an organized and logical approach to specification preparation.

- **Spreadsheets Applications.** All contract requirements are in a spreadsheet format. Paragraphs A and B are in two-column format (item number/requirement), while paragraphs C through G are in the previously described five-column format. Why stop there? Additional columns can be added to cover a variety of information for every contract requirement, from cost estimates to QAE-estimated surveillance times, to dates the requirements were added or last changed. In fact, the DG BOS contract was written using spreadsheet software (Lotus 1-2-3) for just that purpose. Eventually, many of the DG BOS contract administrative duties will be performed using the DG BOS “spreadsheet” which will include the actual PWS as only one of its many parts!

- **Schedules of Deductions.** Individual line items are already identified and the characteristics of the estimated quantities will be helpful in determining schedules of deductions (example: estimated quantity = 14 dumpsters cleaned per week in fiscal year 1986, schedule of deductions quantity = $14 \times 52 = 208$, unit = “each”).

- **QA Plans.** Three of the major QA plan sections already exist — the major contract requirements, the performance standards (Acceptable Quality Levels (AQLs)), and the estimated quantities. Again using the spreadsheet concept, more columns will be added to include the remainder of the MO-327-required QA plan information (primary method of surveillance, level of surveillance, sample size, etc.).

- **Automated Quality Assurance.** Since the spreadsheet we are using can perform computational tasks, travel times and estimated surveillance times will be included

in the future and QAE scheduling will be automated. By linking the spreadsheet to evaluation report forms, and inputting completed evaluation data to a database program, future plans are to use the system to automatically:

- Schedule the QAE’s weekly surveillance. Scheduling will be based on the pre-programmed surveillance frequencies and locations as well as the previous week’s accomplished surveillance.

- Generate the surveillance reports needed by the QAE for the week.

- Summarize the contractor’s performance based on inputted QAE surveillance, calculate deductions, generate necessary letters to the contractor, etc.

Obviously this is a major undertaking in its own right, and is mentioned here only as one of the many outgrowths of the tabular formatting concept to be developed in the months ahead.

Tabular formatting for contract specification writing is more than a “one-shot” solution to the BOS contract needs of Diego Garcia. Application of this format to all manner of PWS seems both possible and exciting. We at PACDIV are exploring the possibilities now. We hope users throughout the Civil Engineer Corps community also find the concept will help them prepare service contract specifications that are clearer, more concise, and easier to enforce. □