

# Specification Preparation Training Course Guide

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## **Forward**

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## *I. What is a Well-Written Shipwork Specification?*

1. A well-written shipwork specification is a technical document that describes the minimum ship-specific work requirements in clear, concise, well-defined, and contractually sound terms. It states precisely everything that is necessary – nothing more and nothing less. It provides a stand-alone description of shipwork, which is both **biddable** and **executable**.
2. Preparing a specification is technical writing in its most exacting form because specifications control the spending of money. Lawsuits, claims and Requests For Equitable Adjustment (REAs) based on the interpretation of a specification occur frequently. Even when lawsuits, claims or REAs do not result, poorly written specifications lead to disagreement, poor working relationships, unnecessary negotiations and compromise, excess costs to one or both of the parties, schedule extensions, and jeopardized vessel readiness. Every word and every line in a specification result in money either spent wisely or wasted.

## ***II. What are the Legal Implications of the Specifications?***

1. Specifications are often developed by engineers and surveyors, using engineering terms or language, so they are often thought to be separate from the contract, and not subject to the rules of contract law. This idea is incorrect.
  - The specification is an **integral part of the contract**, and is subject to all of the requirements for drafting and interpreting contract instruments. Because the specifications describe the essential nature of the work to be done by the contractor, and often in language that may not be widely understood, the possibility of misinterpretation is great.
2. Specifications must be so drafted that **all requirements will be enforceable** in the courts or before the Boards of Contract Appeals, in the event that legal action becomes necessary.
  - Under normal circumstances, when all goes well between parties during the life of the contract, difficulties over interpreting its language are infrequent. It is only after problems arise and the parties become adversaries, that the need for clarity and precision of a well-drafted specification becomes significant.
  - Even though litigation is not contemplated upon entering into a contract, clearly written, well-defined and legally enforceable specification documents may have a calming influence on both parties during contract performance and dissuade any thoughts about litigation.
3. A specification is a **legally binding contractual document** that is the key piece of evidence identifying what work the government requires the Ship Manager to accomplish on Prime/Sub contracts, and the repair contractor to accomplish under IFB type contracts.
  - Consequently, the specifications must provide sufficient information to effectively carry out the required work, and simultaneously be free of language that might cause confusion.
4. Specifications describe the contractual work requirements and they are the **heart of the procurement action** so they must include a clear and concise description of the work requirement.
  - Development of the specifications is the most important step in the procurement process. A poor description of the work requirement is likely to be misunderstood, leading to – if not causing – problems throughout the procurement process and subsequent contract performance.
  - Although a clear and concise description of the work does not guarantee that the contract will be successful, it does significantly reduce the likelihood that

problems will arise. Because it usually takes longer to solve a problem than it does to avoid one, it makes sense to take the time to do it right initially.

### *III. Who are the Specification Audience and Readership?*

1. Specifications have to be thoroughly read and studied by many different kinds of people.
  - The **activities of all specification readers are governed by the contract specifications**. All readers must be able to understand the requirements without having to interpret, extrapolate, or guess at the specification's meaning.
2. A specification never has only one reader and all the readers never fall into the same category.
  - The points of view or aims of the parties vary, often to the point of being diametrically opposed to each other.
  - In the upper echelon of education and experience are engineers, architects, management supervisors, and surveyors. In the lower echelon are on-the-job workers such as craftsmen, mechanics, and junior grade inspectors, who must often work under a minimum of supervision. All these people have to be able to interpret the intent of the specifications to some degree. Consequently, the level of language should be as simple as possible.
  - Another group must be considered when lawsuits are taken into account. This group includes judges and lawyers. To avoid misinterpretation in a court, the language of a specification must be exactly precise.
3. Write the specification as if you had no knowledge of who would perform the work or where it would be done. Don't assume anything.
4. Write the specification as if the reader has no knowledge of the work to be performed.

#### *IV. Why Have Clear and Concise Specifications?*

1. A clear and concise specification is essential.

- **Before Contract Award**, the contractor must understand the specification requirements to be able to develop its technical, management, and staffing plans, and to price its proposal or plan properly. The specifications are the official **biddable** description of the work requirement and they must provide the contractor with enough information to develop and price their proposal without the need for further explanation.
- **After Contract Award**, the contractor must understand the specification requirements to be able to perform the work properly without the need for additional information, in other words, **executable**. The specifications provide the only description of the requirements that the contractor is legally bound to follow, and define the contractual scope of work. Accordingly, they must clearly and concisely describe what is to be accomplished and note any special considerations or constraints that apply.
- **The contractor is required to accomplish only that which is written into the contract.** A poorly defined specification therefore creates a need for changes in the technical requirements, opening the contract to pricing and delivery changes. The number of changes and difficulties in negotiating their scope and price are directly related to the quality of the specifications. If the specifications are ambiguous or unclear and a dispute arises over contract interpretation, the courts and boards will follow the contractor's interpretation. The courts and boards generally hold the originator or writer of the specification responsible for its clarity.
- Elements of Clear and Concise Specifications versus Poorly Written Specifications:

##### **GOOD Specification**

Clear and Concise:

- Biddable description of work requirement
- Executable description of work requirement
- Info for Contractor to develop price
- Contractor must understand spec
- Legally binding
- Few changes
- No extensions
- Vessel Readiness not compromised

##### **BAD Specification**

Poorly Written or Ambiguous Specs:

- Limited description of work requirement
- Contractor needs future information
- Low ball pricing (partial estimate)
- Contractor does not understand specs
- Spec reader makes interpretations for clarity
- Numerous change orders
- Extension(s) required (work identified late)
- Vessel readiness in jeopardy

2. Performance Standards and Contract Baseline are established.

- The specifications, through their description of work requirements, **establish** the goals that become the **standards against which contract performance is measured**. The specifications are not complete unless they describe both the work requirements and the criteria for determining whether the work requirements are met.
- The specifications also **establish the baseline from which the degree, extent, and ramifications of proposed contract changes are determined**. Proposed changes are checked against the specifications to determine if they are within the scope of the contract. If a proposed change is within the scope of the contract, the change is handled via a contract modification. If it is not within the scope of the contract, a new contract is required. The clarity and conciseness of the specifications are, therefore, important throughout the life of the contract.

3. Basis of Estimate provided in specification.

- The prospective contractor needs sufficient information on which to base the estimated cost of contract performance. This “**basis of estimate**,” is provided in the specifications through a detailed description of the task requirements, a statement of the estimated level of effort required, or both.
- Contractors develop cost **estimates based on the work description** in the specifications. First, they typically break the work description down into its smallest components. Then, starting from the bottom up, they develop estimates of the resources necessary to complete each component of each task (labor, materials, and subcontractors). Cost figures are developed for the estimated resources required. Overhead and general and administrative expenses are added to make up the total estimated cost. Profit or fee is then added to the total estimated cost to come up with the total estimated price.
- The work requirement must be described in a manner that will enable the contractor to develop an accurate cost estimate. If the successful contractor’s estimate is too high, you will pay more than you should for the contract effort. If the contractor’s estimate is too low, the contract requirement will be underfunded and will put the contractor in a loss position, because the contractor must complete the effort regardless of its own costs. Contractors in a loss position will try to minimize their losses by cutting corners or making contract changes, if they can. Cutting corners adversely affects the contract quality, and changes usually increase the contract cost. Neither of these actions is in your best interest.
- A well-written specification is no guarantee that the contractor will develop an accurate cost estimate. Many requirements are inherently difficult to estimate because of the nature of the work. Therefore, it is important to write the specifications as accurately as possible. A well-written specification helps

minimize the differences between estimated and actual costs by providing the contractor with the best possible basis for cost estimating.

- The basis of good estimates is detail. Specifications that contain sufficient information to ensure detailed estimates for each identified task within the specification allow for better knowledge of the work to be performed.
- Example of elements of Specifications that provide sufficient detail versus inadequate or broad detail:

**GOOD Specification**  
Task Definition:

T.O.	Labor	Mat	Subs	Dur
1. Task A	\$20.00	\$45.00	\$1500	3
2. Task B	\$45.00	\$60.00	\$3000	5
3. Task C	\$60.00	\$10.00	\$2500	8
4. Task D	\$50.00	\$20.00	\$2000	15
5. Task E	\$80.00	\$40.00	\$6000	10
<b>Totals</b>	<b>\$25,500</b>	<b>\$112,000</b>	<b>\$15,000</b>	<b>41</b>

**BAD Specification**  
Specification Definition (Broad):

T.O.	Labor	Mat	Subs	Dur
T.O.	\$25,000	\$15,000	\$5,000	25
<b>Tot</b>	<b>\$25,000</b>	<b>\$15,000</b>	<b>\$5,000</b>	<b>25</b>

- Good specifications permit accurate estimates for the identified tasks, measurement of actual versus estimated costs and clear time estimates for task duration.
4. Good Communication increases understanding.
- The specifications are ultimately a **vehicle for communication**. They must communicate your requirements in a manner that can be understood by all personnel (both government and contractor) involved in the solicitation process as well as those involved in contract performance.
  - It is a mistake to use the specification language as a test of the contractor’s ability to understand the requirements because misunderstandings may well be carried through into contract performance. The quality of the specifications directly affects the quality and pricing of the contractor’s proposal and, eventually, the quality of the contractor’s performance.

## *V. Should Growth Work be Anticipated?*

1. When preparing for an upcoming ship repair project, the possibility of additional work must be carefully considered. It is extremely important to **anticipate growth work**, especially when the possibility of growth work is high and resulting repairs may be costly.
  - Examples of typical shipwork items that have a high potential for growth are:
    - structural repairs to uncoated salt water ballast tanks
    - re-coating internal areas suspected of containing lead-based paint
    - oil contamination of tanks
    - examination of a salt water circulating pump that has no record of casing repair during its previous 20-year service life.
2. Specification writers should use their professional judgment to make a contingency plan for accomplishing growth.
  - For example, when planning for ABS examination of a saltwater pump, it is prudent to plan for a requirement to renew the wearing rings, the packing sleeves, and the bearings. These requirements should be reflected in the language of the initial or parent work specification. This will reduce unanticipated growth work, increase the accuracy of the repair budget, and allow for a better-managed availability.
3. Anticipation of growth work is the key to successful management of growth work.
  - Benefits of anticipated growth work versus unanticipated growth work:

### **GOOD Specification**

#### Growth Anticipated:

- Pre-bid inspections
  - Ship Surveys
  - Deficiencies identified
- Open/Inspect/Report within first 25% of Project
  - Included in initial estimate
  - Duration factored in to schedule

#### Benefits:

- Control sequences of activities and events
- Control costs
- Control project schedule
- Maintain vessel readiness

### **BAD Specification**

#### Growth Not-anticipated:

- **No** Pre-bid inspections
  - **No** Ship Surveys
  - **No** Deficiencies identified
- Open/Inspect/Report within first 25% of Project **not** included in spec package.
  - **Not** Included in initial estimate
  - Duration **not** factored in to schedule

#### Consequences:

- At mercy of when growth work is found
- Potential for increased costs
- Potential for time extension
- Cannot maintain vessel readiness

## ***VI. Why Have a Pre-bid Ship Inspection?***

1. Although planning for growth work and writing work items is important, it should not be used in place of thorough ship survey and deficiency identification. The commitment of additional time and money in the pre-bid planning phase to properly survey the ship and to accurately identify the scope of repairs needed is of the utmost importance. Minimizing all emergent work, both growth work and new work will lessen the probability of claims by the ship repairer. In other words, it will lessen the time and costs of repair, and it will make the task of managing the availability less difficult.
2. When there is a high probability of growth repair work and consequent high cost, the Ship Manager or government representative should conduct **a comprehensive physical inspection of the ship** before shipwork specifications are written. Consideration may be given to the inclusion of Regulatory Body attendance (i.e., ABS, USCG) for their input and comments relative to this inspection.
  - The goal of the physical inspection is to verify actual shipboard conditions compared to deficiencies documented in MARTS. This may require additional effort; such as initiative by the project manager to obtain industrial assistance to open and ventilate tanks, sample for hazardous materials, or open machinery for inspection. However, the effort expended will result in specifications that more accurately describe the required shipwork, and consequently will contribute to an efficient, low-growth shipyard repair period.
3. Where physical inspection is not possible, shipwork that has potential for growth related repairs should be covered by either supplemental or optional open/inspect/report work item in the bid-phase of the work package. Such specifications should require unit prices for finite quantities, for bidding purposes only.

## ***VII. When Should Open-and-Inspect Shipwork Items be Scheduled?***

1. When "**open-and-inspect**" shipwork items are included in a specification package they must be scheduled and accomplished early in the availability.

- If no time requirement is specified, and "open-and-inspect" items are accomplished late in the availability, the potential for schedule disruption, contractor claims, and contract extensions is significant.
- A requirement should be included in the Task Order or specification that requires open-and-inspect work within a specific number of days from the start of the availability or within a definitive time-frame, such as within the first 25% of the availability. Items potentially requiring long lead-time material ordering should be accomplished immediately after contract award.
- Supplemental and optional items must be identified by the Ship Manager or COTR and issued to the contractor or subcontractor as early as possible in the availability to minimize the chance of them adversely affecting the availability milestones.

### ***VIII. Who Should Determine Means, Methods, and Sequence of Shipwork Items?***

1. Specifications usually describe what work is to be done. Specifications normally do not describe how the work is to be done.
2. **Avoid specifying the means, methods, and sequences of accomplishing work** when writing shipwork specifications. Generally, means, methods, and sequences "belong" to the shipwork contractor and are his responsibility. There may be particular occasions where the government requires that the work is accomplished in a specific manner, but it should be the exception and not the rule. In these unique cases, the work procedure must be clearly defined, but not worded so narrowly that it limits competitive bidding for the work.
  - An example of a situation where the government may want to specify the sequence of work is directing the contractor that painting of the engine room will not be accomplished concurrently with the reduction gear casing being lifted. While this may be a prudent measure to prevent contamination of the reduction gears, it must be recognized that such a requirement acts to restrict the contractor to schedule the required work and deploy his resources to accomplish that work. Such restrictions are the genesis of many contractor claims.

### ***IX. Why Provide Information on Hazardous Materials?***

1. Identify known or suspected hazardous material in the specification in order to fix the cost of its removal and disposal.
  - Do not fail to **identify hazardous materials** in a specification and subsequently assume that it is the contractor's responsibility to determine the presence of hazardous material during a pre-bid ship inspection and include the cost of removal and disposal of hazardous material in his bid.
  - If hazardous materials are not identified in the bid specification, the cost of its removal and disposal will be significantly greater when, during the availability, the contractor "discovers" hazardous materials in the course of conducting the repair work.
    - For example, if a main steam line is scheduled for repair, and asbestos insulation is suspected to be present, the insulation should be tested prior to writing the specification. A statement should be included in the specification stating that asbestos is suspected. The specification should then require the contractor to submit a price for the work in two ways. First, one which includes the cost of accomplishing the work along with asbestos testing, removal and disposal in accordance with local, state, and federal safety regulations. Secondly, one which addresses accomplishing the work as if no asbestos is present. If it is later determined that no asbestos is present, the contract can be modified to delete the removal and disposal requirements of the specification.
2. If hazardous materials are known or suspected to be generally present aboard the ship in the area where repair work has been scheduled, a supplemental shipwork specification can be written. This supplemental specification should then specify the testing, removal and disposal of quantities of hazardous materials for the contractor to submit unit prices with his bid.
3. Identify hazardous materials as soon as known. Do not assume it is the contractor's responsibility to identify the presence of hazardous materials. Waiting for the contractor to identify hazardous material runs the risk of increased cost, time extensions and directly impacts vessel readiness. It may also increase the probability of a claim for delay and disruption by the contractor.

4. Example of results of providing information on hazardous material versus not providing:

**GOOD Specification**

Identify up front:

- Test substance
- Remove
- Include in specs to be accomplished as early as possible.
- Included in initial estimate
- Duration factored in to schedule

Results:

- Control sequences of activities and events
- Control costs
- Control project schedule
- Maintain vessel readiness

**BAD Specification**

Find out later:

- Stop work to test.
- Disrupt production schedule to remove.
- Negotiate after identification
- **Not** Included in initial estimate
- Duration **not** factored in to schedule

Consequences:

- At mercy of when Haz Mat is found
- Potential for increased costs
- Potential for time extension
- Cannot maintain vessel readiness

## ***X. What are Acceptable Formatting Conventions for Writing Specifications?***

1. As you write a specification, you need to **make sure that your thoughts are organized**.
  - There should be a logical flow from sentence to sentence and paragraph to paragraph. Ideally, each paragraph should be limited to a single topic.
2. **Sentences should be as short and concise** as possible.
  - Avoid excessively long sentences that must be read several times to determine the meaning. Keep in mind though, that a string of short, choppy sentences can be equally difficult to read.
3. **The length of sentences** should be checked during the review of the first draft.
  - Readability is usually measured in terms of the sentence length and the number of syllables per word or number of multi-syllable words.
    - The typical readability standard used by most newspapers and magazines is an average of 17 words per sentence and an average of 147 syllables per 100 words. This standard is geared to readers with an 8<sup>th</sup> grade education. Given the technical nature of many government requirements, it may be difficult to write at that level and still describe the requirements adequately.
  - A reasonable writing standard for government specifications ranges from the 8<sup>th</sup> grade standard to an average sentence length of 25 words and an average of 167 syllables per 100 words (college level).
    - Consider rewriting sentences if they appear to be too long. When sentences get too long, the reader’s thoughts tend to wander. The result is rambling or run-on sentences that are often next to impossible to decipher.
    - Poorly constructed sentences are always a problem. It is always a good idea to have a competent editor or peer review your work. Another pair of eyes can often catch things that you can easily overlook due to over-familiarity with the specification.
4. Basic Format of the Specification

Use of a “narrative” style specification, absent a format of logical sections, is difficult to write and understand, and will often result in work requirements and performance criteria being missed by the contractor. Shipwork specifications may be written using the standardized baseline specification format as shown in **Appendix A** and described below:

- The **Heading Section**

The **Heading Section** is used to provide important basic identification information about the shipwork specification. The Heading Section consists of the following parts:

- **Shipwork Specification Item Number**

Shipwork specifications should be numbered in some way for tracking purposes.

- **Baseline Specification Number**

The **Baseline Specification Number** is the item number of the corresponding baseline specification (if applicable) that was used as a template from which to develop the work item. This number is based on a Work Breakdown Structure (WBS) system of codes.

- **Date**

The **Date** is the date that the work specification is written.

- **Deficiency Sequence Number (DSN)**

The **Deficiency Sequence Number (DSN)** is the code that is taken from MARTS for identifying deficiencies. The DSN must be included with every specification.

- **Vessel**

**Vessel** is the name of the appropriate vessel where the work is to be performed.

- **Originator/Writer**

**Originator/Writer** is the name of the person originating or writing the work item.

- **Item Name**

Paragraph one of the shipwork specification should be **Item Name**. Item Name is the noun name of the general requirement, system, structure, machinery, equipment, or component that is the subject of repair, followed by a descriptive adjective. Following the noun name, provide a short descriptive verb phrase of the required repairs.

Examples of correct Item Names are:

"PUMP(S), Main Feed; Overhaul", or, "SHOREPOWER; Provide."

- **Scope of Work**

Paragraph two of the shipwork specification should be **Scope of Work**. The Scope of Work paragraph should consist of subparagraphs, as follows:

- **Intent:** A short plain language statement is included to summarize the intent of the specification.

For example, "The intent of this specification is to clean, prepare, and preserve the shaft alley bilges."

- **Location of Work:** Compartment name and frame/deck number designation should be used to describe the location of the work. Where several locations are involved, the term "Throughout the ship" should be used followed by a reference in the work description wherein each specific repair location will be listed. If the location of the work is not necessary, enter "N/A".
- **Identification:** A complete description of the machinery or equipment should be made, using manufacturer, model, serial number, or equipment designation, to describe the equipment. If identification of the machinery or equipment is not necessary, enter "N/A".

- **Work Description**

Paragraph three of the shipwork specification should be **Work Description**. The Work Description paragraph should describe the minimum work and material requirements to be accomplished by the contractor. Paragraph three should contain the following elements, as required, to describe the scope and extent of the work description:

- **General Description of the Work**

The written work description should be logically arranged, and describe the normal sequence of required work. For complex items, where a normal sequence would be confusing, a trade or component work description breakdown may be used. However, within the trade or component breakdown, a normal sequence, (e.g., a chronological breakdown of the required work) should be described.

- **Check Points**

Requirements for check points should be inserted into the specification to correspond to stages of work where it is necessary for the government to verify or check the progress of the contractor's work. Normally, check points are required in the production cycle where critical work or tests are performed, or where subsequent production would mask previously performed work. Definitive Accept-Reject criteria must be included in the Check Point description and must be accurate.

The word "**CHECK POINT**" should be inserted in upper-case **BOLD** letters at the left margin, immediately following the text paragraph describing the last work operation that the contractor must perform prior to notifying the Ship Manager or COTR of the check point. After the word "**CHECK POINT**", insert a short phrase, in parentheses, describing the check point.

For example, **CHECK POINT - (Hydrostatic Test)**.

If there is a requirement for more than four hours advance notice before conducting a check point, the requirement should also be inserted within the parentheses.

The paragraph immediately following the words **CHECK POINT** should describe the check point requirements and any accept/reject criteria.

– **Regulatory Requirements**

Regulatory or Classification test and inspection requirements should be listed as a **CHECK POINT** if they are known and definable at the time the work specification is written.

The contractor normally should be required to identify and coordinate all regulatory-body tests and inspections that are part of the shipwork specification. However, the specification writer should make every effort to include all known regulatory inspections, tests, and examinations in the specification as work requirements and check points.

The contractor shall identify and schedule all regulatory requirements with the Ship Manager under Prime/Sub contracts or the COTR under IFB type contracts. Contract deliverables such as condition reports, survey and inspection reports, and process control procedures are not check points and should not be listed as such in shipwork specifications.

– **Process Control Procedure Requirements**

Process control procedure requirements should be included in the Work Description paragraph. Process control procedures should be used when inspection and tests cannot assure contractual compliance of the product.

Examples of shipwork where a process control procedure might be appropriate include the cleaning and flushing of critical systems, special welding procedures, and so forth. In most cases, the contractor should be required to develop any required process control procedures for Ship Manager or COTR review and approval at a defined point in time prior to start of work, normally two to four weeks.

– **Technical Representative Requirements**

Requirements for technical representative support should be described in the Work Description paragraph. The specification must state whether the technical representative is to be furnished by the Ship Manager, government, or by the contractor. The technical representative's qualifications and estimated duration of technical representative's work must also be specified. The Ship Manager under Prime/Sub contracts, or the COTR under IFB type contracts should identify the contractor's selection of required technical representative(s) in advance, for review and approval.

Examples of shipwork that normally requires technical representative support are: paint representatives; OEM representatives for main engines/reduction gears/shaft seals; thruster and controllable-pitch propeller repairs; vibration and thermography analysis; automation and electronics repair; radio room certification and testing; radar repair; boiler controls; underwater hull inspection; and repairs or inspection of other complex equipment and systems.

– **Major Interferences**

If major interferences, (e.g., structural members, cables that must be cut, high pressure piping, hydraulic systems, charged systems) exist that are in the way of work described in the specification, removal of those interferences should be specifically described in the Work Description paragraph.

– **Quality Assurance Requirements**

Quality Assurance (QA) requirements or documentation of material to be furnished by the contractor should be listed in the Work Description paragraph.

For example, the requirement for a technical representative to witness tests of the repairs should be addressed in the Work Description paragraph.

– **Report Requirements**

Reports that the contractor must provide should be specified the Work Description. Additionally, requirements concerning the timeliness and periodicity of reports must also be specified. This includes condition reports and survey and inspection reports.

– **References**

References that are necessary for the contractor to accomplish the stated work must be specified in the Work Description paragraph. Do not cite a reference unless it is available to the contractor.

– **Drawing and Other Technical Requirements**

Requirements for drawings, blueprints, instructions, manuals, placards, signs, and other documents to be submitted by the contractor should be specified in the Work Description paragraph.

– **Definitions**

Any definitions necessary to clarify the scope or requirements of the work description should included in the Work Description paragraph.

– **Hazardous Materials Identification**

Hazardous Materials that will affect the contractor's performance of the shipwork specification should be identified.

For example, the specification should describe the type, location, extent, and special characteristics of asbestos, compressed gases, lead-based paints, caustic chemicals, or similar products that may be affect the contractor's performance of the required shipwork.

- **Performance Criteria or Deliverables**

Paragraph four of the shipwork specification should be **Performance Criteria or Deliverables**. This paragraph should list all check points, reports, process control procedures, and other deliverables that are listed in paragraph three, (The Work Description), of the specification. Thus, paragraph four will provide the contractor and Ship Manager or COTR with a concise summary list of the checkpoints, deliverables, and other important milestones of the shipwork specification.

If the contractor is required to interface with regulatory agencies, (e.g., USCG, ABS, FCC) to determine what inspections, reports, surveys, and tests are required, then the performance criteria/deliverables may be supplemental to those required by the regulatory bodies. If there are no performance criteria/deliverables for a given item, then "NONE" should be entered into this element of the specification.

- **Notes**

Paragraph five of the shipwork specification should be **Notes**. This paragraph should be used to list applicable OFM, GFM, OFI, GFI, OFE, and GFE. Paragraph five should contain explanatory notes or information that is not included elsewhere in the specification. Paragraph five may also be used to list miscellaneous information that impacts the completion, testing, or critical path of the specification. No shipwork requirements should be placed in paragraph five of the specification.

- Example of the format of a good specification versus a poor specification:

**GOOD Specification**

Organized with subsections

Sample

- a) -----
- i) -----
- b) -----
- i) -----
- ii) -----

**BAD Specification**

Rambling narrative

Sample

-----  
 -----  
 -----  
 -----  
 -----

**Consequences**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>▪ Clear concise instructions describe work to be accomplished.</li> <li>▪ Identifies major work item components, Process control procedures, Tech Rep requirements, Interferences, Test requirements, QA requirements, Report requirements.</li> <li>▪ Control project cost and schedule by clearly identifying those tasks which comprise a specific work item.</li> <li>▪ Maintain vessel readiness by knowing exact status of work.</li> <li>▪ Sequence of work indicated.</li> </ul> | <ul style="list-style-type: none"> <li>▪ Ambiguous directions may lead to disputes over intent, scope and location of work.</li> <li>▪ Lack of work component identification can lead to increased cost due to disagreements as to what was included or not include in the specification.</li> <li>▪ Lack of item description and identification may lead to increased costs and time extensions due to different interpretations of specification intent.</li> <li>▪ Cannot maintain vessel readiness because all work may not be known</li> </ul> |
|---|---|

## ***XI. What are Some Suggested General Specification Writing Guidelines?***

1. Specifications must be written to logically describe the chronological sequence of work required. For example, a typical sequence of work may include removal; disassembly; inspection; reporting; repairing; reassembly; re-installation; and testing requirements.
2. Every specification must be "complete in itself." The expression "complete in itself" means that a contractor, using the only information contained in the specification (including any references), can conduct the required repairs in a finished, technically satisfactory, and cost-effective manner. The work requirements of the specification must include tests and inspections required ensuring that all work is satisfactorily accomplished.
3. Correct preparation of specifications requires the inclusion of substantial information. If possible, information should be taken from physical documentation of actual ship conditions. Information from RRF-MARTS, survey reports, sea trials, contractor reports, and technical manuals should be used to prepare accurate shipwork specifications.
4. Specification writers may select an appropriate specification from MARAD's Baseline Specification Library to use as a guide/template for preparing the ship-specific shipwork specification. When the required shipwork cannot be adequately described using a baseline specification, a unique specification should be prepared from scratch. In both cases, the format and content guidelines contained in MARAD's Baseline Specification Program Guide may be followed.
5. Ensure that shipboard locations and conditions are accurately described in the specification.
6. Avoid legal phraseology. Instead, use simple, direct statements. Do not get carried away with your linguistic abilities. Using "big words" or technical terminology may demonstrate your educational attainments, but does little for effective communication. If a sentence has to be read more than once to figure out its meaning, the sentence may need rewriting.
7. Avoid sentences that require other than the simplest punctuation and proper grammar. Improper punctuation, typographical errors, poor grammar or missing lines of text can occur in any document. However, as the language in a specification carries the weight of the contract, it is especially important that these types of mistakes be removed from the document before it causes confusion.
8. Do not repeat. There is a tendency to repeat mandatory requirements such as "in accordance with the plans and specifications" several times in a particular work item. One such statement in the particular work item is sufficient.

9. Do not include redundant statements in an attempt to clarify or emphasize a specification. Make each statement complete enough to stand by itself.
10. Do not put multiple thoughts into a single subparagraph. Each subparagraph should be short, complete, concise, and should convey a single thought or requirement.
11. Use standard symbols and abbreviations consistently.
12. Do not use the numeral 1 alone. It can be mistaken for a lower case L. Instead, write the numeral 1 out as "one."
13. Only use cross-references to avoid typing when and where it is appropriate.
14. Do not refer to attachments, enclosures, or references to avoid writing the work requirements into the specification.
15. Do not refer to references unless they are available to the contractor.
16. Do not explain why a requirement is included.
17. Carefully study any material to be included by reference to make certain that all provisions apply.
18. Make certain that any drawing or other material referred to include all the information you intend to convey.
19. Make use all available background and technical reference material during preparation of specifications. Your memory is not infallible.
20. Ensure that technical manuals and drawings that are referenced in the specification are relevant to the required work and available to the contractor.
21. Include guidance drawings, sketches, or data if they will assist the contractor to efficiently accomplish the required work.
22. Allow for possible reduction in size during reproduction when choosing the sizes for letters and figures on drawings. Drawings must be legible and of sufficient quality to be easily read.
23. Do not originate language when you can make use of statements that have proved to be effective through previous usage.
24. When you contemplate following a previously used specification, check with people who have experience with it. They can point out its good and bad features as well as any lessons learned.
25. Base all requirements on a thorough analysis and evaluation of the problem.
26. Avoid requirements that are impossible or impractical to enforce on the job.

27. Define all terms that can be subject to more than one interpretation, usually in a glossary section of the general clauses.
28. Do not repeat general requirements in technical shipwork specifications that should be covered once in the general requirement specifications. (e.g., issues such as contractor furnished material, cleanliness, cleaning and coating of disturbed surfaces, and so forth.)
29. Do not say, "Obtain the services of a Marine Mechanical Engineer to supervise." Instead, say, "Obtain the services of a Marine Mechanical Engineer to provide technical assistance."
30. Do not provide bills of material for CFE. Let the contractor determine the materials needed to accomplish the work.
31. Do not direct the contractor to make "temporary accesses" unless there is a compelling reason to specify the access.
32. Identify known or suspected long lead-time Contractor Furnished Equipment (CFE) and Contractor Furnished Material (CFM) items.
33. Identify known sources of CFE, CFM, and contractor-furnished Technical Representatives.
34. Avoid supplying technical representatives, subcontractors, and Ship Manager or government furnished material. Poor performance or late delivery by the Ship Manager or government may result in delay and disruption claims by the contractor.
35. Release a specification only when you are sure that the task can be satisfactorily accomplished, with no further communication between you and the contractor.

## *XII. What are Common Ambiguities in Specifications?*

1. Avoid words and phrases that obscure meaning and hinder communication. Some types of words and phrases are particularly susceptible to misinterpretation, and therefore should be avoided. Ambiguities arise when the specifications are written so that the meaning or intent of the requirement is uncertain, leaving the contractor in doubt about what is required. These ambiguities often result in differing interpretations of the requirements. Ambiguities can make a simple contract difficult because they cloud the intent of the contract. Unfortunately, the resulting problems usually do not show up until well into contract performance.
2. Ambiguous writing may result from many causes and may cause the contractor to improperly interpret the specification. Improper interpretation may, in turn, result in inaccurate bidding for the work or unsatisfactory work performance. Note that contractors will invariably choose the least costly (to the contractor) interpretation of the specification.
3. Correcting such problems is an expensive and time-consuming process and sometimes results in a dispute that must be resolved by a board of contract appeals or a federal court. As a reminder, the boards and courts generally favor the contractor's interpretation of an ambiguity, as long as it is reasonable, because a contract is usually interpreted against the party who drafted the ambiguous language.
4. Ordinarily, a contractor enters into a contract with the intent to provide a quality product. This is how the contractor stays in business. However, when faced with an ambiguous specification, the contractor must make his own interpretations of the requirements. A number of factors, such as the contractor's technical competence and financial status, corporate or individual goals and the contract schedule influence these interpretations. The contractor's interpretation may produce a result contrary to what you intend.
5. Contractors are obligated to question obvious ambiguities before contract award, and the government must respond with clear-cut answers. Often, however, ambiguities are not recognized as such initially, and the contractor proceeds on its own understanding of the requirement. This is why problems with ambiguities usually do not show up until the contract is nearing completion.

- For an example of an ambiguity, consider the following wording:

"Install 12 storage bins (2 ft. X 2 ft.) in the GSM (frame 4-107-2) and dry provision (frame 4-107-1) storerooms."

Does the specification require the installation of 12 or 24 bins?

- **Other Typical Ambiguities:**
  - **Inconsistency of requirements**
    - ◆ Ambiguities are often the result of careless writing that causes inconsistencies in the specification requirements. These inconsistencies occur, for example, when work requirements are set forth throughout the specifications rather than being concentrated in one area. Fragmenting the requirement throughout the specifications often results in contradictory (and thus ambiguous) requirements in different places in the specifications.
  - **Words out of Context**
    - ◆ The language of the shipwork specification will be read by the courts and boards in context, i.e., its words will be interpreted as a whole, rather than taking a single word, phrase or sentence out of context with the balance of the document. Where examples are used to explain a definition, caution should be exercised to tell the reader whether these examples are only illustrations, or they constitute a complete list of all examples covered by the definition. Where examples are included as illustrations, a qualifying statement should be included, e.g., “such as, but not limited to.” This will ensure that the contractor knows that the list is not all-inclusive.
  - **Calling a requirement by different names**
    - ◆ Ambiguities also occur when the same requirement is called by different names at different places in the specifications, making it difficult to determine if the description is of one or two requirements. This can be quite difficult to control, particularly if different individuals author individual sections of the shipwork specification. The same words or phrases should be used throughout the shipwork specification to express the same meaning.
  - **Inconsistent use of nomenclature**
    - ◆ The use of nomenclature to describe hardware or parts thereof must be consistent throughout the text. For example, a part, once described as a “plate”, should not be referred to elsewhere as a “cover.” Do not refer to a requirement for a “brace” at one point and refer to it later as a “support.” These inconsistencies cause confusion regarding the real meaning and could lead the contractor to provide both a plate and a cover or a brace and a support. It is natural that when the reader of a shipwork specification observes a variation in a word or phrase of definition or nomenclature, he will look for new meaning, and ambiguity or outright contradiction may be the result. The contractor will always interpret an unclear word, phrase, or specification to his advantage.

- **Conflicting or unreasonable time schedules**
  - ◆ Ambiguities are often created when time schedules conflict or are not reasonable. These conflicts may be within the same work item, between different work items, or between the specifications and other parts of the contract package. Sequencing and scheduling work in specifications should be avoided. Require the contractor to plan and schedule all work activities in an appropriate Planning and Scheduling specification item.
  
- **Incomplete description of the requirement**
  - ◆ Ambiguities also occur when the specification writer assumes that the prospective contractors will, or should, “intuitively understand” a requirement and therefore does not describe it fully. It is a mistake to rely on the contractor’s understanding, whether it is a sole source procurement or a competitive procurement. You might be tempted to assume that any competent contractor would understand what is meant, and you would be right. However, understanding a poorly worded specification should not be a criterion in determining a contractor’s competency.

In competitive procurements some specification writers leave out parts of the requirements purposefully, on the basis that “any qualified contractor should know this.” In effect, the specification writer is using the incomplete specification as an evaluation factor to test the offeror’s competency. If an offeror does not question the missing material and fails to address it prior to contract award, it indicates that the offeror is not sufficiently qualified to do the work. This is a mistake. A contractor is required to do only that which is written into the contract. If a requirement is not spelled out in the specifications or a contract clause, it is not a contractual requirement and cannot be enforced without a contract modification and usually additional cost. Although there are some exceptions to the requirement that everything must be in writing (such as a subtask that is inherently part of the primary task), you cannot count on legal technicalities to rescue you from the results of your careless writing.

- **Vagueness**
  - ◆ Ambiguities often result from vagueness in the specifications – when activities are alluded to but not clearly described, or when passive or indefinite wording is used. Phrases or sentences that are not clearly expressed (or perceived, or identified) lack the preciseness needed in a good specification. Selecting and using the word of the desired specificity or exactness is always difficult. Among the more commonly used words that may create difficulty are: “augment,” “concept,” “functional,” “implement,” “parameters,” “substantial,” “thresholds,” and “workmanlike.” When it is necessary to use words such as these, care should be taken to assure that they are clarified in the adjacent text or otherwise defined.

- **Generalized language**
  - ◆ Some ambiguities are difficult to detect on review. These often occur when the specification writer is unsure how to describe the requirement and uses generalized language. Since a reviewer would probably have the same difficulty describing the requirement, he or she might not discover the ambiguity. If not detected on review, vagueness can (among other things) make it difficult to distinguish until it is too late.
  
- **Abstractions**
  - ◆ Abstractions that are little more than sweeping ideas or fancy concepts that cannot be defined can cause problems. Avoid all abstract terms.
  
- **Unnecessary comments**
  - ◆ Unnecessary comments or nonessential statements can cause confusion. These most often occur when you try to “fill out” paragraphs that you think are too short. Do not try to “salvage” a poorly written sentence or specification by indiscriminately, including additional, and perhaps improper, words. Instead, rewrite the sentence or specification in accordance with this guide.
  
- **Misuse of Terms**
  - ◆ Make sure that mandatory language is properly used. Use the word “shall” whenever there is a need to express a provision or action by the contractor that is binding. The specifications contain what are essentially commands to the contractor. The use of the imperative ensures that there is no misunderstanding of the contractor’s responsibilities.
  
  - ◆ It may be necessary to use the word “will” in cases where a future need is required, i.e., the ship will supply power for the motor. Use the word “will” to express an action by the government. Do not use “will” in conjunction with contractor actions because the word does not expressly require the contractor to take action. The consistent use of “shall” for contractor actions and “will” for government actions makes it easier to distinguish contractor responsibilities from government responsibilities.
  
  - ◆ Use “should” and “may” whenever it is necessary to express a desire or preference, but not a requirement.
  
- **Indiscriminate use of words**
  - ◆ Words that have varying meanings may cause costly disagreements between the contracting parties.
  
  - ◆ For example, avoid using misleading terms such as replace, refurbish, renovate, or rejuvenate. If one or more of these terms does have to be used, use it with consistent meaning throughout the work specification.

Provide definitions in the specification for terms that are subject to varying interpretation.

- ◆ The following terms are defined in MARAD Baseline Specification 011-001.G "GENERAL CRITERIA", but others may be added as necessary:
  - **Remove** means to take the existing off the ship without replacement.
  - **Renew** means to remove the existing, then furnish and install with new approved for the purpose.
  - **Repair** means to fix the existing, thereby restoring it to its original capabilities.
  - **Install** means to establish new where there was no prior existing installation.
  - **Provide** means to furnish and install all services, materials, equipment, and systems to accomplish the specified requirements.

– **Non-definitive Work Requirements**

- ◆ Non-definitive work requirements occur when appropriate accept/reject criteria are ambiguously or inadequately described in the shipwork specification.
- ◆ Examples of non-definitive work requirements are:
  - "**Check** bearing temperature and vibration."
  - "Support new pipe with **adequate** hangers."
  - "**Prove** gaskets and bolting **satisfactory**."
  - "Close up **as original**."
  - "Supply **suitable** fire pump."
  - "Close up in **proper** order."
- ◆ Non-definitive work requirements can be avoided by accurately specifying what work, equipment, tests, or performance, is required by the contractor. When specifying equipment that cannot be sole-source from a specific vendor or model, list the main features that are required.
- ◆ For example, when specifying a pump, write, "Install a 250 GPM at 50 FT TDH, bronze body pump with monel shaft and impeller, mechanical seals, and motor, Worthington model 3LR-O or equal." Compare this language with item #5 above that calls for a "suitable" fire pump. Clearly, the latter

statement more accurately describes the desired pump, and will contractually obligate the contractor to provide the type of pump actually required.

- ◆ It is important to note that the marine surveyor or port engineer must be able to use the language of the shipwork specification to conclusively determine whether or not the contractor's work is in compliance with the requirements of the contract.
- ◆ Do not direct the contractor to “replace with material in kind” or “replace with material same as existing.” The existing material may be the cause of the failure or problem. Specify the material to be used.

- **Additional Guidelines Related to the Use of Words**

- The following general guidelines can help you exercise care in your choice of words when writing a specification:
  - ◆ Avoid **words that are vague or inexact**. Words such as “similar,” “type,” “average,” and “about” create uncertainties and make it difficult to determine how well the contractor has performed.
  - ◆ Avoid the use of **colloquialisms**, buzzwords, jargon, slang, and in-house or trade terminology that may not have a common meaning to all readers. The meaning of such terms often varies by geographical area and segments of the industry.
  - ◆ Use the **active voice** rather than passive voice. Avoid the use of the words “should” or “may” when describing contractor actions. Use the active voice “shall” to ensure that the action is taken. The passive voice does not specify who is acting.
  - ◆ Use **simple words and phrases** when possible. Given the technical nature of many government requirements, any reduction of multi-syllable words will improve the specification’s readability. When possible, use words from the table in the Glossary of Simple Work Words to describe contractor actions.
  - ◆ Minimize use of the **general terms** “as shown” and “as specified herein” or other terms that generally reference other parts of the specifications, the contract, or another document only generally. Make references explicit, citing the page, section or paragraph number of the referenced item.
  - ◆ Avoid using **non-definitive phrases**. These phrases are not sufficiently definitive and leave the action to be taken to the contractor’s discretion. If

one of these phrases must be used, explain the specific circumstances under which an action would be “applicable,” “required,” or “necessary.” Use of non-definitive phrases may lead to the issuance of a non-definitive work requirement by the contractor, and thus delay or thwart the accomplishment of the required ship repair work.

- Examples of non-definitive phrases are:
  - ✘ "As applicable."
  - ✘ “As required”
  - ✘ "In accordance with latest requirements."
  - ✘ "Or other recognized methods."
  - ✘ "As practicable" or "As necessary."
  - ✘ "Or other suitable method."
  - ✘ "Check for proper values."
  - ✘ "Suitable."
  - ✘ "In accordance with good marine practice."
  - ✘ "Provide a positive means of."
  
- Do not use **technical test definitions or requirements** such as 1.5 times the working pressure." Instead, specify the exact test parameter; "Test to 150 PSIG." Always give definitive test criteria.
  
- Do not use **qualifying phrases** or **words with multiple meanings** to modify the actions of the contractor. Specification requirements must be definitive and clearly stated. The following are examples of qualifying phrases that tend to create ambiguity and misunderstanding:
  - The word “include,” for example, may mean “included but not limited to” - or, it could mean, “consists of.” Other words of this type are “guide,” “guidance,” “or equal,” and “average.” If it is necessary to use such words, their exact meaning should be defined.

- Other examples of such phrases are:
  - ◆ “As directed by”
  - ◆ “As approved by”
  - ◆ “To the satisfaction of”
  - ◆ “To all intents and purposes”
  - ◆ “In accordance with instructions of”
  - ◆ “Insofar as possible”
  - ◆ “Pending future development”
  - ◆ “Unless otherwise directed by”
  - ◆ “As determined by”
  - ◆ “At the discretion of”
  - ◆ “In the judgment of”
  - ◆ “In the opinion of”
  - ◆ “In strict accordance with”
  - ◆ “In accordance with best commercial practice”
  - ◆ “In accordance with best commercial standards”
  - ◆ “In accordance with best modern standard practice”
  - ◆ “In accordance with the best engineering practice”
  - ◆ “In accordance with good marine practice”
  - ◆ “In accordance with applicable published specifications”
  - ◆ “Accurate workmanship”
  - ◆ “Workmanship shall be of the highest grade”
  - ◆ “Workmanship shall be of the highest quality”
  - ◆ “Installed in a neat and workmanlike manner”

- ◆ “Skillfully fitted”
  - ◆ “Securely mounted”
  - ◆ “Properly assembled”
  - ◆ “Properly connected”
  - ◆ “Good working order”
  - ◆ “Of standard type”
  - ◆ “Of an approved type”
  - ◆ “Good materials”
  - ◆ “Products of a recognized reputable manufacturer”
  - ◆ “Materials shall be of the highest grade, free from defects or imperfections, and grades approved by”
  - ◆ “Carefully performed”
  - ◆ “Suitably housed”
  - ◆ “Neatly finished”
  - ◆ “Pleasing lines”
  - ◆ “Smooth surfaces”
  - ◆ “Metal parts shall be cleaned before painting”
  - ◆ “Kinks and bends may be cause for rejection”
  - ◆ “Testing will be accomplished unless waived”
  - ◆ “All reasonable requests of \_\_\_\_\_ shall be complied with”
  - ◆ “Furnish, if requested”
  - ◆ “Photographs shall be taken when and where directed by”
- Do not use **the term “and/or.”** It is ambiguous when used in a contract and allows the contractor to decide whether to add (and) or substitute (or). If you can’t decide whether to add or substitute, describe the circumstances as a design point during contract performance and describe how the decision will be made.

- Be careful about the use of **common phrases** that are better explained by a single word. Their use adds words but not value to the specification:
  - “in the event that” use “if” instead
  - “it is possible that” use “may” instead
  - “due to the fact that” use “because” instead
  - “in connection with” use “of,” “in,” or “on” instead
  - “in accordance with” use “with” or “by” instead
  - “the majority of” use “most” instead
  - “in order to” use “to” instead
  - “whether or not” use “whether” instead
  - “in the amount of” use “for” instead
  
- Avoid using **blanket phrases** that are of little practical value. Blanket phrases are ineffective because they cannot be translated into a definitive performance standard. These include:
  - “best commercial practice”
  - “best marine practice”
  - “good workmanship”
  - “maximum reliability”
  
- Avoid **phrases that contribute little to the meaning of the sentence**, such as:
  - “as noted”
  - “at the same time”
  - “in connection with”
  - “on the other hand”
  - “with reference to”
  
- Do not call for the contractor to “**assist**” or perform “**as directed**” unless the specification explicitly describes the “assistance” actions or the specific circumstances under which “direction” will be provided. These phrases imply impermissible personal services through detailed supervision of contractor employees and fail to define the required effort properly.
  
- Watch out for redundant phrases that use two words instead of one. The word in parentheses is unnecessary and in some cases will create an ambiguity:
  - “adequate (**enough**)”
  - “combine (**together**)”
  - “could (**possibly**)”
  - “(**mutual**) cooperation”
  - “separate (**out**)”
  - “share (**together**)”
  - “(**sound**) logic”
  - “(**still**) continues”

- “(still) remains”
  - “(still) retains”
  - “sufficient (**enough**)”
  - “(essentially) complete”
  - “(viable) alternatives”
  - “(considered) judgment”
- Use **abbreviations and acronyms** only when absolutely necessary. If you must use an abbreviation or acronym, spell the word or phrase out in full the first time used, followed by the abbreviation or acronym in parenthesis. Consider spelling the words or phrases out periodically in a long specification. You may also include a glossary when numerous abbreviations and acronyms are used, but include only those terms used in the specifications.
  - Do not use symbols to define dimensions. For example: (") for inch; (') for foot. Spell out the dimension words: "one foot;" "2 feet;" "24 inches".
  - Do not use **indefinite phrasing** to “flesh out” the specifications and make them sound better. The following phrases lack specific interpretation and can be defined in a number of different ways, creating ambiguity and misunderstanding:
    - “a sufficient number of times”
    - “meaningful results”
    - “selection among significant alternatives”
    - “delivery of pertinent data”
    - “utilization of optimum alternatives”
    - “maximum use of available technologies”
    - “assure optimum system availability for continuous use”
    - “thoroughly clean”
    - “extreme care is to be taken”
  - Do not use **catchall phrases** that generalize what the contractor is to do. This kind of generalization leaves the interpretation to the contractor. You may not like the contractor’s interpretation. Do not use catchall phrases to attempt to avoid issuing change orders during the availability. The use of catchall phrases usually proves more costly to the Ship Manager and government than the issuance of a change order when required. During the bid phase of the work, the contractor will increase the amount of the contract bid to ensure adequate funding for accomplishment of work described by catchall phrases.

Examples of catchall phrases are:

- "Included but not limited to."
- "As required."

- "Any and all."
- "Each and every."
- "When and where necessary."
- "Etc."
- Use of **arbitrary statements** may result in the improper assignment of authority to a supervisor, another individual, or activity. Avoid using arbitrary statements in the specification.

Examples of arbitrary statements are:

- "When directed by ship's force."
- "To the satisfaction of MARAD or Ship Manager representative."
- "In accordance with MARAD or Ship Manager directives."
- "Additional repairs will be specified by Delivery Order to be issued by the COTR."
- "Additional repairs will be specified by Change Order by the Ship Manager."
- **Approval versus acceptance** –  
Be wary of the word **approval**. This is especially important when addressing contractor requirements related to schedules, drawings or documents.
  - The word **approval** means an "endorsement as accurate" and even ownership. A schedule developed and submitted by the contractor to the Ship Manager or to the government for approval may contain logic, sequence, or duration flaws. If the Ship Manager or government "approves" the schedule, they endorse it as being completely accurate. Once the Ship Manager or government approves a schedule, drawings, or other documents of the contractor, they are bound to the terms contained therein, whether or not they are correct or accurate. Because of this, the word **acceptance** should be used instead of approval.
  - The word **acceptance** means that you have "taken receipt" of the schedule or documents, but have not necessarily endorsed them as being accurate. By simply using the word acceptance instead of the word approval the Ship Manager or government will not be bound by mistakes in the contractor's schedules or documents.

- Do not routinely require the Ship Manager Port Engineer or Contracting Officer Technical Representative (COTR) to approve selection of subcontractors in a work item. Instead, specify that the contractor shall be fully responsible for the selection and performance of subcontractors.
- Do not attempt to write an exact shipwork specification if the **scope of work** is **unknown** at the time the specification is written. Instead, unknown or poorly defined work must be written as a general "Open, inspect, and report" specification. The shipwork specification should contain anticipated work provisions and quantities to assist the contractor to submit an accurate bid. Direct the contractor to bid the work in a unit-work price quote manner, (e.g., square feet of coatings, tons of steel, gallons of "slops" removal, and so forth). Then, during the course of actual repairs, specific amounts of work can be effectively required by issuance of a delivery order(s) based on unit-work price quotes previously bid by the contractor.
- Do not issue a specification that attempts to address unresolved problems. Doing this may confuse the contractor.
  - For example, a specification for a motor driven pump with severe vibration problems should not direct specific repairs until the cause of the vibration, and possible damage from the vibration, has been determined.
- If the exact quantity of material required to accomplish the work is known, state it in the specification. However, if the exact quantity is not known do not specify quantities of material in the specification. Instead, give a definitive description of what work is required. A definitive description of what work is required will enable the contractor to determine the quantity of materials required to complete the specified work. This avoids disputes over exact quantities and will reduce the chance of the contractor submitting a claim.
  - For example, instead of writing, "Renew 175 feet of 4-inch extra-heavy black iron pipe in the Storeroom (XYZ)," write, "Renew the 4-inch extra-heavy black iron pipe in Storeroom (XYZ) from the first flange forward of the after bulkhead to the first flange aft of the forward bulkhead." In the latter case, the contractor can determine the exact quantities needed during the pre-bid ship inspection period or when doing material take-off from available drawings.

**Appendix A**  
**Baseline Specification Format**

**Item No:**

**Baseline Specification No:**

**Date:**

**DSN:**

**Vessel:**

**Originator/Writer:**

**Item Name**

**Scope of Work:**

**Intent:** (Scope of work statement)

**Location of Work:** (Compartment/space name and number)

**Identification:** (Equipment/machinery/component/structure identification)

**Work Description:**

Complete narrative description of all work to be accomplished (in paragraph format as desired).

- Subparagraphs as appropriate
  - Sub-Subparagraphs as appropriate
  - Sub-Subparagraphs as appropriate
  
- Subparagraphs as appropriate
  - Sub-Subparagraphs as appropriate
  - Sub-Subparagraphs as appropriate

**Performance Criteria/Deliverables:**

**Notes:** (Omit if not applicable)

## Appendix B Glossary of Preferred Terms

Following is a list of preferred terminology that should be used when applicable:

<u>PREFERRED</u>	<u>NOT DESIRED</u>
Accomplish the requirements	Accomplish the work, or Comply with
Accomplish	Conduct, or Perform (Conduct may be used for an operational test)
Remove	Drain
Remove existing and install (or renew)	Replace, or Unship new
Disconnect	Unbolt
Preserve (or coat)	Paint
Inspect	Check
Fabricate	Make
Measure	Take
Shall be	Is to be, Should be, Must, May be
(Specify a Quantity)	All
Verify	Demonstrate, Prove
Ensure	Assure, or Insure
Listed	Identified
Through	Thru

**Appendix C**  
**Glossary of Simple Work Words**

Work Word	Definition
Analyze	Solve by analysis
Annotate	Provide with comments
Ascertain	Find out with certainty
Attend	Be present at
Audit	Officially examine
Build	Make by putting together
Calculate	Find out by computation
Compare	Find out by likeness or differences
Consider	Think about, decide
Construct	Put together, build
Contribute	Give along with others
Control	Direct, regulate
Create	Cause to be, make
Define	Make clear, set limits
Design	Make original plans, sketch an outline for
Determine	Resolve, settle, decide
Develop	Bring into being
Differentiate	Make a distinction between
Erect	Put together, set upright
Establish	Set up, settle, prove beyond dispute
Estimate	Judgment of approximate value or amount
Evaluate	Find or fix the value of
Evolve	Develop gradually, work out
Examine	Look at closely, test quality
Explore	Examine or discover
Extract	Take out, deduce, select
Fabricate	Build, manufacture, invent
Form	Give shape to, establish
Formulate	Put together and express
Generate	Produce, cause to be
Inquire	Ask, make a search of
Inspect	Examine carefully or officially
Install	Place, put into position; establish new where there was no prior existing installation
Institute	Set up, establish, begin
Integrate	Combine parts to make a whole
Interpret	Explain the meaning of
Investigate	Search into, examine closely
Judge	Decide, form an estimate of
Make	Cause to come into being
Manufacture	Fabricate from raw materials
Notice	Comment on, review

Observe	Inspect, watch
Organize	Integrate, arrange in a coherent way
Originate	Initiate, give rise to
Perform	Do, carry out, accomplish
Probe	Investigate thoroughly
Produce	Give birth or rise to
Provide	Furnish and install all services, materials, equipment, and systems to accomplish the specified requirements
Pursue	Seek, obtain, accomplish
Reason	Think, influence another's act
Recommend	Advise, counsel, suggest
Record	Set down in writing, electronic reproduction of communications
Remove	Take the existing off the ship without replacement
Renew	Remove the existing, then furnish and install with new approved for the purpose
Repair	Fix the existing, thereby restoring it to its original capabilities
Resolve	Reduce by analysis, clear up
Review	Inspect, examine, evaluate
Scan	Look through hastily
Search	Examine to find something
Seek	Try to discover, make an attempt
Solve	Find an answer
Study	Carefully examine or analyze
Trace	Copy or find by searching
Track	Observe or pilot path of
Update	To bring up to date
Utilize	Use, find a use for
Validate	Make valid, confirm
Verify	Check the truth or correctness of
Warrant	Prove or guarantee

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