

| <b>DATA ITEM DESCRIPTION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| <p><b>1. TITLE</b></p> <p style="text-align: center;"><b>VERIFICATION REQUIREMENTS SPECIFICATION (VRS)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p><b>2. Identification Number</b></p> <p>PPA-003914-7<br/>17 August 2017</p> |
| <p><b>3. DESCRIPTION/PURPOSE OF THE VRS</b></p> <p><b>3.1</b> The Verification Requirements Specification (VRS) describes the qualities of the evidence required that a set of requirements defining an item is satisfied. The item may be of any nature whatsoever, ranging from, for example, a physical object, to software, to an interface, to a data item, to a material, or to a service.</p> <p><b>3.2</b> The VRS is used to communicate to verification design personnel the characteristics required of any verification solution, i.e. the VRS is a major input to the development of test procedures and other means of verification. The VRS also provides the criteria against which test, and other verification procedures, may themselves be verified.</p> <p><b>3.3</b> The VRS is <i>not</i> a list of verification methods, unless the only requirement regarding each verification activity is that it be performed in a particular way, i.e. a verification solution direction.</p> |                                                                               |
| <p><b>4. APPLICATION/INTERRELATIONSHIP</b></p> <p><b>4.1</b> This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by the activity of verification requirements definition.</p> <p><b>4.2</b> This DID is used when one or more stakeholders in an item, having requirements on that item, also require evidence that each requirement (or a subset of the requirements) has been met.</p> <p><b>4.3</b> This DID may be cited in a Statement of Requirement (SOR), Statement of Work (SOW), a Contract Data Requirements List (CDRL), within a standard invoked by a SOR or SOW, or within a plan or procedure.</p>                                                                                                                                                                                                                                                                                                                    |                                                                               |
| <p><b>5. PREPARATION GUIDELINES</b></p> <p><b>5.1 General Instructions</b></p> <p style="padding-left: 20px;">a. <b>Automated techniques.</b> Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.</p> <p style="text-align: right;">continued next page</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                               |
| <p><b>6. SOURCE</b></p> <p>Copyright Project Performance International. This document may be reproduced and distributed without restriction except as below provided that all reproductions contain the original copyright statement in the original form and location. Derivative works may be produced provided each derivative work contains a copyright statement referring to the content in which PPI holds copyright, in a form and in a location no less prominent than the copyright statement on the original. Copies and derivative works may not be used for the delivery of training for profit.</p>                                                                                                                                                                                                                                                                                                                                                                                          |                                                                               |

## 5. PREPARATION GUIDELINES (continued)

- b. **Alternative presentation styles.** Diagrams, tables, matrices, and other presentation styles are suitable substitutes for text when data required by this DID can be made more readable using these styles.
- c. **Title page or identifier.** When data are supplied in the form of a paper document or word processing file, the document should include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date of issue, document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number if applicable; CDRL item number if applicable; organization for which the document has been prepared and name and address of the preparing organization. For data supplied in an alternative form, this information should be included on external and internal labels or by equivalent identification methods.
- d. **Table of contents.** When data are supplied in the form of a paper document or word processing file, the document should contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table and annex. For data supplied in an alternative form, this information should consist of an internal or external table of contents containing pointers to, or instructions for, accessing, each paragraph, figure, table and annex or their equivalents.
- e. **Page numbering/labeling.** When data are supplied in the form of a paper document or word processing file, each page should contain a unique page number and display the document number, including version, volume, and date of issue, as applicable. For data supplied in an alternative form, files, screens, or other entities should be assigned names or numbers in such a way that desired data can be indexed and accessed.
- f. **Response to tailoring instructions.** When data are supplied in the form of a paper document, paragraphs that have been tailored out of the DID should result in the corresponding paragraph number and title in the document, followed by "Not applicable" or alternatively, paragraph numbering may be varied to allow for the missing paragraph. For data supplied in an alternative form, the "Not applicable" representation may be incorporated in the table of contents or equivalent.
- g. **Multiple paragraphs and subparagraphs.** Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.
- h. **Standard data descriptions.** If a data description required by this DID has been published in a standard data element dictionary, reference to an entry in that dictionary is preferred over inclusion in the data item itself.
- i. **Declarative style.** Where a non-declarative guidance style is used in this DID ("should") but a declarative style ("shall") is required by the user of the DID, the DID should be tailored accordingly.
- j. **Substitution of existing documents.** Other existing documents may be substituted for all or part of the data item if they contain the required data and are invoked in the data item as a part of the data item.

## 5.2 Acronyms

Acronyms used in this document shall be interpreted as follows:

|             |                                         |
|-------------|-----------------------------------------|
| <b>CDRL</b> | Contract Data Requirements List         |
| <b>DID</b>  | Data Item Description                   |
| <b>SOR</b>  | Statement of Requirement                |
| <b>SOW</b>  | Statement of Work                       |
| <b>VRS</b>  | Verification Requirements Specification |

## 5.3 Abbreviations

Abbreviations used in this document shall be interpreted as follows:

|               |                               |
|---------------|-------------------------------|
| <b>CONUSE</b> | Concept of Use                |
| <b>REQID</b>  | Requirement Identifier        |
| <b>SI</b>     | International System of Units |

## 5.4 Foreword

This Data Item Description (DID) for a Verification Requirements Specification (VRS) is intended to provide guidance and instruction on the preparation of a VRS. A VRS describes the qualities (strength) of the evidence required that each requirement in a set of requirements defining an item is satisfied. The item may be of any nature whatsoever, ranging from, for example, a consumer product, a capability system, a materiel item, software, an interface, a data item, a material, or a service. The generic term "item" is used in the body of this DID.

Although the VRS is general in its application, an important application of the VRS is in the context of contracting for an item, where the contractor is also contracted to perform testing, most commonly for the purpose of acceptance. In the absence of a VRS, it is anybody's guess as to the amount of testing that is appropriate. This can lead to dispute, under-verification or over-verification.

Verification is a high cost activity. However, the impact of not detecting failure to satisfy requirements can be catastrophic. The development of verification requirements for some items can be almost as important as the development of the requirements on the item itself. For other, low risk items, verification requirements may be of low importance.

The VRS is *not* just a list of verification methods, unless the only valid requirement regarding each verification activity is that it be performed in a particular way, i.e. a verification solution direction. This would normally be quite inappropriate across a set of requirements, for about 50% of the requirements.

## 5.5 Content Requirements

Content requirements begin on page 5. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "5.5" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 5.5.1.1 within this DID.

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## **1. INTRODUCTION AND SCOPE**

This section may be divided into the following paragraphs where the volume and content of relevant information justify sub-paragraphing.

### **1.1 Identification**

This paragraph should contain a full identification of the item to which the VRS applies, including, as applicable, identification number(s), title(s), abbreviation(s), and version number(s).

Where the item to which the VRS applies includes variants of the item, the above information should be provided for each variant.

Where the item to which the VRS applies includes incremental builds of the item that are subject to individual specification within the requirements specification, the above information should be provided for each build.

### **1.2 Background and Intended Use of the VRS**

This paragraph, if used, should briefly state the intended use of the VRS, together with any relevant background such as past verification activities. This paragraph should also describe any security or privacy considerations associated with its use.

### **1.3 Relationship to Other Documentation**

This paragraph, if used, should describe the relationship of the VRS to other relevant documentation, such as requirements specifications, test procedures, other forms of verification design descriptions, test cases, specified pass/fail criteria, and verification plans.

## **2. APPLICABLE AND OTHER REFERENCED DOCUMENTS**

This section should list the number, title, revision and date of each document referenced in the VRS. This section should also identify the source of each document not available through normal channels.

### **2.1 Applicable Documents**

This paragraph should list each document that is invoked in whole or in part within the VRS as a part of the verification requirements.

### **2.2 Other Referenced Documents**

This paragraph should list each document which is referenced in the VRS but which does not form a part of the verification requirements.

## **3. DEFINITIONS, ACRONYMS AND ABBREVIATIONS**

This section should be divided into the following paragraphs.

### **3.1 Definitions**

This paragraph should list alphabetically and define each word or term used in the VRS for which reliance on dictionary definitions or usage in a relevant technical community is not appropriate. As a guide, terms which are not likely to be in the vocabulary of the intended users of the VRS, terms which have multiple dictionary meanings but only a single VRS meaning, specialist technical terms, and terms which are used with special meanings, should be defined in this paragraph.

Alternatively, this paragraph may specify by name and issue a suitable technical dictionary or other reference publication to be used in the interpretation of terms used in the VRS and which meets the criteria above for definition of terms.

### **3.2 Acronyms**

This section should list alphabetically each acronym used in the VRS, together with the acronym's expanded meaning.

### 3.3 Abbreviations

This section should list alphabetically each abbreviation used in the VRS, together with the abbreviation's expanded meaning, except that abbreviations within the International System of Units should not be listed.

## 4. VERIFICATION REQUIREMENTS

This section should be structured as a table. The first column of the table should list by reference each requirement on the item that is the subject of the VRS. Requirements may be identified by unique identifier (REQID) or by any other unambiguous means. The first column may also summarize the subject of the requirement. The second column should state, item requirement by item requirement, the corresponding verification requirement, if any. Safety, security and privacy considerations may be highlighted, as applicable, in a third column, or by the use of notes.

The form of the verification requirements table is illustrated below:

| System Requirement Reference  | Corresponding Verification Requirement                                                                                                                                                                                                                                                             |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REQID 001 (message switching) | Demonstrate correct switching with not less than 850 message test cases that have been approved for the purpose, in writing, by the Project Authority. The test cases are to be selected to exercise norms, and to probe extremes, as defined in CONUSE, GERPS Project Document No. 4529871-05-1A. |
| REQID 002 (status indication) | Provide evidence by Demonstration.                                                                                                                                                                                                                                                                 |
| REQID 003 (mass)              | Prove compliance (confidence level 100%).                                                                                                                                                                                                                                                          |
| REQID 004 (reliability)       | Demonstrate compliance at a confidence level of not less than 98.5%.                                                                                                                                                                                                                               |
| etc.                          | etc.                                                                                                                                                                                                                                                                                               |

Where a directed verification method is the only characteristic required of the verification activity, the directed method may be one of, at least:

- a) Analogy;
- b) Analysis;
- c) Analysis incorporating Test data;
- d) Certification;
- e) Demonstration;
- f) Examination/Inspection; and
- g) Test.

**Note, however, that the focus of verification requirements must be the qualities of evidence required that each requirement has been met, not *how to provide that evidence*.** If such methods are used as, or referred to in, verification requirements, the method referred to should be defined at 3.1.

The possibility also exists of there being no verification requirement. In this case "None" should be entered in the second column. More commonly, at least Certification of compliance by the supplier would constitute the minimum verification requirement.

## **5. NOTES**

This section, if used, should contain any general information that aids in understanding the document (e.g., background information, rationale), or other information that assists in use of the VRS, e.g. reference to a database form of traceability between item requirements and corresponding verification requirements.

### **A. ANNEXES**

Annexes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each annex should be referenced in the main body of the document where the data would normally have been provided. Annexes may be bound as separate documents for ease in handling. Annexes should be lettered alphabetically (A, B, etc.).

Appendices may be used to annexes. Appendices should be numbered numerically (1, 2 etc.).