



## **Technical Document Style Guide**

Prepared by the AACCE International Technical Board

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## 1. Overview

### 1.1. Purpose

The purpose of this document is to establish the production and editorial review requirements (including format and writing style) for all technical documents published by AACE International (AACE or the Association). The intent is to produce technical documents that are clearly written, and consistent in style and form.

### 1.2. Scope of Application

This style guide is applicable to the following technical documents published by the AACE International Technical Board within the hierarchy of Association Intellectual Property (IP):

- Technical Papers,
- Recommended Practices (RPs),
- Professional Guidance Documents (PGDs), and
- Professional Practice Guides (PPGs).

The above technical products will be inclusively referred to as documents herein. For guidance in grammar and usage not included in this manual, please consult *The Chicago Manual of Style*.<sup>1</sup>

### 1.3. General Requirements

AACE is a non-profit organization that is registered in the United States and is governed by U.S. Federal law. All technical products must comply with U.S. laws, regulations, and economic sanctions as well as the AACE Canons of Ethics.

## 2. AACE Product Production, Evaluation and Review Requirements

The AACE Technical Board has established production, evaluation, and review requirements for all IP. This includes the requirement that product submissions conform to AACE International product templates, demonstrate subject matter competency, and meet evaluation and review criteria.

### 2.1. Conformity to AACE International Product Templates

Standard formatting styles for section headings, figures, tables, and other key elements have been established in the AACE approved templates.

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<sup>1</sup> The Chicago Manual of Style, 18th ed., The University of Chicago, 2024.

All technical products should be submitted to AACE International using the latest revision of the approved AACE templates available from the AACE website and in their native formats.

For more details on general style and structure, see Section 4.2 on page 8.

## **2.2. Demonstration of Subject Matter Competency**

All technical documents are peer reviewed and must clearly present technical competency and expertise in the subject. All technical products published by AACE International are intended to be a source of learning and reference to practitioners.

### **2.2.1. Recommended Practices**

Recommended practices are intended to provide guidelines for implementation of best practices associated with the *Total Cost Management Framework*. A recommended practice is not an appropriate outlet to present new concepts that have not been widely accepted by industry practitioners.

### **2.2.2. Technical papers and presentations**

Technical papers and Presentations are intended to provide contributors an outlet for presenting innovative ideas, best practices, case studies, and lessons learned.

## **2.3. Technical Document Review Process**

Reviews of technical products for consistency and alignment to the requirements of this document is the accountability of the Technical Board prior to publication. All documents should align with the *Total Cost Management Framework* and previously published recommended practices.

### **2.3.1. Recommended Practice Review Process**

The process for development and review of recommended practices shall follow the guidance provided in the *AACE Recommended Practice (RP) Development Process* which is available on the AACE website ([www.aacei.org](http://www.aacei.org)).

### **2.3.2. Technical Paper Evaluation and Review Process**

The process for development and review of technical papers shall follow the guidance provided in the *AACE Technical Paper Development Process* which is available on the AACE website ([www.aacei.org](http://www.aacei.org)).

## **3. Legal Issues**

### **3.1. Authorship**

All technical documents are to be original documents of the author(s) or primary contributor(s). All authors and primary contributors identified must have contributed to

the writing of the document in a substantive manner as outlined in the development guidelines for recommended practices and technical papers.

### **3.2. Plagiarism**

Plagiarism is the use of another person's words, thoughts, ideas, or other works without explicit acknowledgment of the original author and source. Plagiarism is unethical and unacceptable. AACE International conducts plagiarism checks on all technical documents submitted to the association; and violators may face penalties.

### **3.3. Guidance related to use of Artificial Intelligence**

Contributors developing AACE technical products shall address subjects within their competence areas. They shall be qualified by education or experience in the specific technical fields involved. A contributor shall not include subject matter information in which they lack competence, nor shall they include any material that was not prepared under their direction and control without citation to primary sources, including chapter and page number.

The use of artificial intelligence (AI) for research is permitted, but each technical segment must be prepared and supported by the contributors' knowledge and experience. All citations must reference primary source documents (not AI-generated text). Submission of material (derived from AI) that is not within the author's area of technical competence could be an ethical violation.

### **3.4. Ownership of Figures**

If not created and owned by the author, all figures (photographs, illustrations, or other graphical elements) must be accompanied by a copyright release from the content owner that is submitted with the document. If required copyright releases are not submitted with the document, the document will be returned to the author for correction.

### **3.5. Confidentiality Issues**

Do not use data or information that may be considered confidential or proprietary. The purpose of most technical documents is to convey concepts. Whenever possible, use modified data to illustrate the concept in place of actual project data that may be considered confidential.

For case studies or other documents where actual project or potential proprietary information is used, AACE International may require a disclaimer (submitted with the document) from the project or data owner indicating that the information may be included in the product. Where data or information is in the public domain, the author should cite the public domain source of the information. Where potential confidentiality issues exist, AACE International may return the technical product to the author for correction.

### **3.6. Intellectual Property of Others**

If the technical document contains intellectual property owned by a party other than the author, then the author must obtain a release (submitted with the document) from the owner indicating that the information may be included in the document. Proprietary application of knowledge or research gained from the author's employer (or former employers) will require a release. Where potential intellectual property issues exist, AACE International may return the document to the author for correction.

### **3.7. Anti-Competitiveness Issues**

Technical documents dealing with benchmarking issues or provision of comparative metrics must abide by U.S. Department of Justice and U.S. Federal Trade Commission anti-trust regulations regarding benchmarking, including maintaining strict confidentiality of client data and information.

### **3.8. Commercialism**

AACE International will not accept technical documents that are commercial or self-promoting in nature. Whenever possible, refrain from using company/commercial product names and logos.

If a technical document is focused on concepts and features that are common to a class of software packages, and there is no direct marketing intent or implied, then the document will be allowed. If AACE International considers a document to be overly commercial in nature, it will be returned to the author for correction.

Authors are permitted to include references to software or products for the purposes of providing demonstrative examples. Where products are referenced in text or in illustrative elements, a footnote must be included that states "AACE does not promote or endorse specific product(s) mentioned in this document. These items are provided for illustrative purposes only." The footnote should be inserted at the first mention of each product.

### **3.9. Content Copyrights**

The overuse of quotations in a paper may constitute violation of the *fair use* policies of U.S. Copyright law. If AACE International considers that the use of quotations is excessive, then the submitted document may be returned to the author for revision.

### **3.10. U.S. Economic Sanctions**

AACE International must comply with U.S. economic sanction laws enforced by the U.S. Office of Foreign Assets Control that restrict business activities with sanctioned and other sensitive countries. Economic sanction laws prohibit certain business activities with targeted governments, organizations, and individuals, as well as persons and entities that act on their behalf. This may require AACE International to reject papers whose authors

are citizens or residents of countries that are on the list of *sensitive countries* identified by the U.S. Department of State. AACE is committed to accepting papers from foreign authors whenever legally permissible to do so.

## **4. Writing Style**

There are two goals for AACE International technical products. The first is to teach the reader about a subject for which they may have little or no knowledge. The second related goal is to clearly convey concepts and develop the subject thoroughly enough for the reader to put an idea into immediate use.

Do not be constrained by word count. Break concepts down into the simplest step-by-step explanations. Use examples, figures, tables, etc. to illustrate key points. Do not use jargon and avoid obscure technical terms. Finally, write the product so that the idea can be read and understood by a wide audience.

All technical documents should be submitted to AACE International in Microsoft Word and formatted using the appropriate AACE template available from the AACE website. Technical documents must meet all other expectations of style as identified in this document. Failure to follow the indicated style guidelines may result in the return of the document to the author for revision.

### **4.1. Reference to AACE International**

The correct term for the Association name is AACE International. If previously introduced as an acronym, such as AACE International (AACE), then the Association may be referred to as AACE. Never use the acronyms AACEI or AACEi for the Association.

It is also incorrect to use the term AACE International or AACE in a plural or possessive form. It would be correct form to state “AACE International publishes many internationally recognized recommended practices” but incorrect form to state that “AACE International’s recommended practices are internationally recognized.”

### **4.2. General Style and Structure**

Documents should be easy to read and grammatically correct. Humor and colloquial phrases should be avoided, and the inclusion of cartoons is prohibited.

Use the formatting styles included in the AACE International document templates. Indentation for paragraphs, lists, etc. should not be modified from the template settings and should be consistent throughout the document. All text should remain in black font. Use of bold or italics for emphasis is allowed but should be limited. Do not use quotes for emphasis.



#### **4.2.1. Title**

**Recommended practices:** Titles shall be defined as per the scoping document details approved by the technical subcommittee responsible for the knowledge area domain governing the recommended practice subject matter, unless otherwise approved by the Technical Board.

**Technical papers:** The title must accurately describes the technical content of the paper. The title should be limited to approximately ten words or less. Do not use humor in the title. For example, a title such as “10 Things We Remembered in the Bog After the Big Storm” would be better expressed as “Project Control Issues After Hurricane Katrina.” The paper title should convey the technical concept being described in the paper and utilize words that a potential reader might seek when performing an online search for technical documents.

#### **4.2.2. Abstract**

Technical documents must include a short abstract that accurately describes the technical content of the document.

**Recommended practices:** Abstracts for recommended practices are prepared by AACE Headquarters for use by AACE after publication approval.

**Technical papers:** Abstracts for technical papers will be prepared by the author. The abstract should be the same as initially submitted to the AACE International Call for Papers unless, as the paper itself is being written, the abstract needs to be updated to reflect the finished paper. The abstract should be 100 to 200 words in length. If AACE International considers the abstract to be too short, too long, or does not adequately describe the content of the paper then the paper may be returned to the author for revision.

#### **4.2.3. Table of Contents**

Technical documents must include a table of contents listing the first three major text section headings of the document as defined by the established template specification. The Table of Contents should be dynamically populated using the word processor’s Table of Contents functionality.

#### **4.2.4. Length of Technical Product**

While there are no set page length requirements for technical products, the AACE Technical Board will evaluate document length based on the adequacy of the subject matter development.

If AACE International deems a paper too short to have adequately developed the subject matter, then the paper may be returned to the author for revision. Conversely, if a paper is deemed too long because of the inclusion of irrelevant material or from a

lack of focus on the subject matter, the paper may also be returned for correction. Do not include extraneous material in the paper simply to meet a minimum number of words.

**Recommended practices:** AACE suggests recommended practices be ten to twenty pages in length, not including the abstract, table of contents, bibliography, and appendices.

**Technical papers:** AACE suggests that papers include between 3,000 and 12,000 words, not including the abstract, table of contents, bibliography, and appendices.

#### **4.2.5. Paragraphs and sentences**

**Paragraphs:** Each paragraph should typically contain a minimum of two sentences. Each paragraph should develop a thought that is important to the subject matter.

**Sentences:** The document should be written in complete sentences. A sentence expresses a complete thought, and most commonly contains both a noun and a verb. Sentence fragments are not to be used. Conjunction and compound sentences should be used with care. Each sentence should contribute to developing the subject matter of the paper. Ensure that subjects and verbs agree in number (singular/plural). Maintain a consistent tense throughout the document – usually past tense for completed research and present tense for general truths.

#### **4.2.6. Tables, figures, equations, and captions**

All tables, figures, and equations (referred to collectively as “items” in this section) should be introduced and discussed in the body of the text as close as possible to their first reference in the text. The author should tell the reader why the item is included and what the item is intended to illustrate. Items should be clear, legible, and have consistent formatting (fonts, line sizes, etc.). If an item is too large to be legible within the body of the document, it should be moved to an Appendix with a larger page size, (See Section 4.2.10). All items should also include a caption directly underneath the item, which contains the item label, sequential item number, and a description. The caption should typically be limited to ten words or less and be displayed in the AACE template’s caption style. If caption labels are referred to in paragraph text (e.g., See Figure 1), use the cross-references functionality shown in the Insert Tab and References Tab of Microsoft Word.

Authors are required to provide source files for all figures and tables. AACE International requires copyright releases from the content owner for all items that are not original content from the author. Releases must be submitted at the time of document submission. This includes items from other AACE International publications.

For expanded guidance on the utilization of tables, figures, and equations, please refer to Sections 5.3, 5.4, and 5.5, respectively, beginning on page 14.

#### **4.2.7. Quotations and citations**

**Quotations:** The use of quotations should be minimized and employed only for the purpose of providing key points from other technical references. All quotations require citations (including page number) to identify the source.

**Citations:** Due to the technical nature of its products, AACE International follows the *IEEE Editorial Style Manual for Authors* as it relates to citations and references only, except for the location of page numbers. All quotations and other necessary references shall be cited by number in the order they first appear in the document. Within the text of the document, refer to a reference by identifying the reference number (and page number if applicable) within hard brackets.

For expanded guidance and examples of citations, please refer to Section 5.7 on page 19.

#### **4.2.8. Footnotes and endnotes**

**Footnotes:** Footnotes are permissible to provide clarity; however, their use should be minimized. They may be used to provide additional commentary that may detract from the flow of the document's body text. Footnotes should not be utilized in place of a list of references.

If the author is providing a general reference to a source that has not been quoted or paraphrased, it should be placed in a footnote.

Use the built-in footnote function in Microsoft Word. For example, here is an example of a footnote.<sup>2</sup> Refer to the bottom of this page to see what it looks like. Note that if the footnote is adjacent to punctuation, the superscript footnote number should be placed *after* any punctuation.

**Endnotes:** AACE prefers that technical documents exclude endnotes.

#### **4.2.9. List of References**

A list of references should be included at the end of the document that provides complete publishing information for the reader to easily identify source documents that were quoted or paraphrased. Documents provided to the reader for information only (i.e., not quoted or paraphrased) should not be included in the references list. These documents should be provided in a footnote or list of additional resources.

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<sup>2</sup> This is a footnote. It helps to provide clarity but is not a substitute for a reference.

Website references are discouraged in all technical documents. If a reference must be included from a website to meet proper citation of a source, be sure to specify the date the source was accessed. Website references should be from reputable technical sources.

AACE templates contain pre-populated list of sources which includes references commonly cited in AACE technical documents. It is the responsibility of the authors to update the list of references for applicability to the content they are developing in their document.

Authors should utilize Microsoft Word's dynamic bibliography functionality to create a list of references. References should be formatted using IEEE style. A reference list is provided at the end of this document for sample purposes. For expanded guidance on updating the list of references, please refer to Section 5.8 on page 19.

#### **4.2.10. Appendices**

Include ancillary or supporting information in an appendix if required to avoid distracting the reader from the main content of the document. Some common examples include:

- Tables or figures that may be too large to be legible in 8-1/2" X 11" page format,
- Case studies, or
- Demonstrative steps of a methodology.

#### **4.3. Language and Spelling**

The official language for all AACE International technical documents is US English. The latest version of *Merriam-Webster's International Dictionary of the English Language* shall be used as the arbitrator of correct spelling. All spelling, use of prepositions, use of verbs, and punctuation should follow the standards of US English.

Jargon or colloquial terms unique to a particular industry or discipline should be avoided. Words or terms not familiar to the intended audience should be defined or explained. Clarity of the subject matter should always be emphasized.

#### **4.4. Grammar, Usage, and Mechanics**

Technical products require precise and clear writing to effectively communicate complex information. Adhering to modern grammar and punctuation rules ensures that the product is professional and easily understood. Following these guidelines also ensures

published technical documents are consistent in style and aesthetic. The remaining sections of this document provide expanded guidance as follows:

Expanded guidance on document structure and mechanics can be found in the following sections.

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Expanded guidance on language, grammar, and style can be found in the following sections.

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## 5. Expanded guidance on document structure and mechanics

### 5.1. Template settings

Templates are provided by AACE for technical papers and recommended practices. These templates standardize margins, fonts, heading formatting and other stylistic elements to ensure aesthetic consistency of documents published by AACE. Document settings, such as the aforementioned items, should not be modified without approval of AACE Headquarters staff.

### 5.2. Trademarks

Do not include copyright (©) or trademark (™) symbols in the document.

### 5.3. Tables

A table is always distinguished as having rows and columns of information. It is preferred tables are created in Microsoft Word table format or inserted as an object from a table created with Microsoft Excel or Visio. Alternatively, a table may be inserted as a graphical image of a table. Word wrapping should be set to *in line with text*.

### 5.4. Figures

Figures should be inserted in one of the standard image formats (.jpg, .tiff, .png, etc.), or as a Microsoft Visio object. Word wrapping should be set to *in line with text*.

Figures should be clear when scaled to a standard 8.5" X 11" page format and should typically include limited use of color as many readers may be color-blind. When possible, use shading or other graphical elements in place of color.

If the figure is a screenshot from a software application, then the caption should include a notation of the software and version number used to create the screenshot. A sample caption is provided below.

**Figure 1: Example of the critical path (created by XYZ Software, Version 12.2)**

Alternatively, if several screenshots from the same software application are included in the document, then a footnote may be included in the document when the screenshot of the software application first occurs. A sample footnote<sup>3</sup> is provided at the bottom of this page.

### 5.5. Equations and guidance for writing math

#### 5.5.1. Equations:

Mathematical expressions and equations should be displayed on a separate line of their own if they are referenced, or if they are difficult to read in the body of the text.

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<sup>3</sup> Figures 3, 4, and 7 were created using XYZ Software, Version 12.2

Equations should be inserted as a standard image file (e.g. .jpg, .tiff, .png) or using the built-in equation function in Microsoft Word.

When displayed on a separate line, the expression or equation should be aligned to the left, and numbered or labeled. The number or label is enclosed in parentheses aligned to the right margin of the expression or equation (note this requires use of the tab features of Microsoft Word), as shown in the following example:

$$a^2 + b^2 = c^2 \tag{1}$$

This will allow the expression or equation to be referenced later in the document. In the cross-reference, refer to the equation number (e.g. “In equation (1), we see that...” or “Using Eq. 1, the reader can see that...”).

All equations that have been placed on a separate line either for readability or for later reference must be numbered. Do not provide a List of Equations.

### 5.5.2. Writing math:

In addition to the guidance provided in Sections 6.8, the following pertains specifically to mathematical contexts.

**Exponents:** In exponential expressions there are sometimes long and complicated superscripts [e.g.,  $(abc)^{xyz^k}$ ]. These may be brought down in line with the substitution of “exp” or “e” and the addition of square brackets (e.g.,  $\exp[(\text{jwt})\exp[(xyz)k]]$ ).

**Fractions:** Fractions should be enclosed in parentheses if they are followed by a mathematical symbol or expression, (e.g.,  $(a/b)x$ ). For simple algebraic fractions in text, the slash should be used rather than the horizontal fraction bar; for example,  $(ax + b)/(cx + d)$ , not  $ax+b/cx+d$ . Slashes should also be used for fractions in a numerator or denominator (whether in the text or in a displayed expression), as well as in an exponent that expresses a radical:  $\exp[(b-d)^{1/2}]$  for the square root of  $[b - d]$ . Note that a slash connects only the two groups of symbols immediately adjacent to it; thus,  $a + b/c$  is not the same as  $(a + b)/c$ .

## 5.6. Lists

Lists can either be integrated into the text or presented vertically. Short, simple lists work best when run in, especially if they form a complete sentence with the introductory text. Lists that are longer, require typographic emphasis, or contain multiple levels should be displayed vertically.

Introductory numbers or letters in lists should only be included if they serve a specific purpose, such as indicating task order, suggesting chronology, showing relative

importance, facilitating text references, or clearly separating items in a run-in list. If similar lists appear close to one another, it's important to maintain consistent formatting.

Regardless of the type of list selected, lists should be grammatically parallel (see Section 6.1.3). List types should be implemented consistently throughout the document. The choice of separator (numerals or letters) should also be consistent. Items within a list should not be capitalized unless they form a complete sentence.

**Run-In Lists:** These lists are in line with the body text of the document. There should be three or less items in these lists and the items should be brief.

If a run-in list is separated by numerals or letters, they should be enclosed in parenthesis – they should not be italicized. If the introductory content of the sentence is a complete sentence, a colon should separate the leading text from the run-in list. The items should be separated by commas unless any of the items requires internal commas, in which case all the items will usually need to be separated by semicolons. If each item in a list consists of a complete sentence or several sentences, the list should be formatted as a vertical list rather than a run-in list.

*Example of run-in list not separated by numerals or letters:*

The major phases of the project are as follows: design, utility relocations, and construction.

*Example of run-in list separated by numerals:*

The major phases of the project are (1) design, (2) utility relocation, and (3) construction.

*Example of run-in list separated by letters:*

The meeting was attended by (a) executives, (b) managers, and (c) craft employees.

*Example of run-in list requiring semi-colons in lieu of commas:*

The hiking guides recommend that campers pack (a) two pairs of boots, two pairs of sneakers, and plenty of socks; (b) warm, sturdy outer clothing; and (c) a hat and gloves.

**Vertical Lists - Ordered:** These lists are shown below an introductory sentence, followed by a colon. Items in the lists are preceded by numbers, and in some cases, letters. If individual items run over to multiple lines, a hanging indent should be used to align the additional lines with the first letter of the first line.

*Example of a vertical list with numbers where each list item completes the sentence:*

Compose three sentences:

1. to illustrate the use of commas in dates



2. to distinguish the use of semicolons from the use of periods
3. to illustrate the use of parentheses within dashes

*Example of a vertical list with letters where each item is a complete sentence:*

To ensure the team meets the deadline, their manager took the following steps:

- (a) She listed all tasks needed to complete the project.
- (b) She assessed how much time each task would take.
- (c) She assigned each task to team members.
- (d) She frequently checked in with each team member on progress and status.
- (e) If team members were falling behind on specific tasks, she adjusted the plan and, in some cases, reassigned the tasks.

If the items in the vertical list, inclusive of the introductory text and list items form a complete sentence, the structures should include (1) introductory text followed by a colon, (2) list items with semicolons or commas between the items, and (3) a period to follow the final item.

*Example of a vertical list that forms a complete sentence:*

There are at least eight parts of speech in the English language:

- 1) nouns,
- 2) pronouns,
- 3) adjectives,
- 4) verbs,
- 5) adverbs,
- 6) prepositions,
- 7) conjunctions, and
- 8) articles.

**Vertical Lists - Unordered:** These lists are shown below an introductory sentence, followed by a colon. Unless the items consist of complete sentences, there should no punctuation at the end of each line and usually begin with lowercase – except for proper nouns and other terms that are normally capitalized. If individual items run over to multiple lines, a hanging indent should be used to align the additional lines with the first

letter of the first line. If the items in the vertical list, inclusive of the introductory text and list items form a complete sentence, the structures should include (1) introductory text followed by a colon, (2) list items with semicolons or commas between the items, and (3) a period to follow the final item.

*Example of an unordered vertical list that does not complete a sentence:*

Your document submission must include the following items:

- the latest document revision
- the source files for all figures and illustrations
- releases for all copyrighted materials
- the completed comment disposition log

To avoid long, skinny lists, short items may be arranged in two or more columns.

*Example*

There are at least eight parts of speech in the English language:

- nouns
- pronouns
- adjectives
- verbs
- adverbs
- prepositions
- conjunctions
- articles

## 5.7. Quotation and citation examples

Cite all quotations and other necessary references by number in the order they first appear in the document. Within the text of the document, refer to a reference by identifying the reference number (and page number if applicable) within hard brackets.

Page numbers do not need to be included in the citation for paraphrased text but must be included in for quoted text.

*Example of paraphrased text:*

Thomas Edison defined genius as 1 percent inspiration and 99 percent perspiration. [1]

*Example of quoted text:*

A base estimate is defined as “Estimate excluding escalation, foreign currency exchange, contingency, and management reserves.” [8, p.12]<sup>4</sup>

When necessary, legal citations may utilize in-line, expanded referencing, as shown in the example below. In these situations, a citation for the legal reference should also be inserted and included in the references list.

*Example:* A board decision, however, has extended this concept of the evolving critical path to the extreme, finding that the final, as-built schedule should be relied upon as the ultimate critical path that dictates which delays were, in fact, critical. See Sante Fe, Inc., VABCA No. 1943 – 1946, 84-2 BCA ¶ 17,341 (1984). [9]<sup>5</sup>

## 5.8. Updating the List of References

The format of the List of References must follow that identified in the AACE International Technical Document Template. For references and citations, AACE follows the IEEE style guide except as noted in this document.

The *Total Cost Management Framework* [1] and *Recommended Practice 10S-90 Cost Engineering Terminology* [2] should almost always be included as it is expected that all technical documents use consistent terminology and are in alignment with the *TCM Framework*. When using the references feature in Microsoft Word, select IEEE style. When applicable, include page numbers (or section numbers) in the citations. If referring to a reference in a footnote, add the reference number to the footnote as well.<sup>6</sup>

A sample list of references is provided at the end of this document.

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<sup>4</sup> Citation [8] is provided for example only and is not referring to a reference in this document.

<sup>5</sup> Citation [9] is provided for example only and is not referring to a reference in this document.

<sup>6</sup> It is important to ensure that any terminology used, is consistent with 10S-90 [2]

## 6. Expanded guidance on language, grammar, and style

This section provides expanded guidance and examples related to earlier sections of this document. For style-related sections, AACE adopts and adheres to the following interpretations of the *Chicago Manual of Styles*. The style guidance in this section is not intended to be all-inclusive. For any topics not covered, authors should refer to [3].

### 6.1. English language guidance

#### 6.1.1. Common spelling errors

**Alternate vs. alternative:** Use “alternate” when referring to a substitute (e.g., Justin went to the tournament as an alternate). Use “alternative” when referring to a matter of choice (e.g., The procurement officer evaluated several alternative materials to obtain the best pricing).

**Among vs. between:** Use “among” when referring to a group of things (e.g. choose among options”). Use “between” when referring to the relationship of individual items or entities (e.g. choose between Option A and Option B”).

**Amount vs. number:** Use “amount” when objects cannot be counted (e.g., a large amount of water). Use “number” when objects can be counted (e.g., a small number of coins).

**Compose vs. comprise:** Use “compose” when referring to what something is made of (e.g. “a recipe is composed of ingredients”). “Comprise” is a verb referring to what something includes (e.g. “a recipe comprises ingredients”).

**Farther vs. further:** “Farther” refers to physical distance (e.g. Andrea ran farther than Julia). “Further” refers to figurative distance (e.g., . “Nothing could be further from the truth”).

**Fewer vs. less:** Use “fewer” when items being compared can be counted (e.g. Julia earned fewer running medals than Andrea). User “less” when items can be measured (e.g., Julia ran fewer miles than Andrea).

**Principal vs. principle:** “Principal” means primary or main (e.g. the principal office location). “Principle” refers to a rule (e.g. His principles kept him from plagiarizing).

**Precede vs. proceed:** “Precede” means to come before (e.g., “A” precedes “B” in the alphabet). “Proceed” means to continue (e.g., After stopiing at the traffic signal, the driver proceeded through the intersection).

**That vs. which:** Use “that” for restrictive clauses (essential information) and “which” for non-restrictive clauses (additional information, set off by commas).

**Who vs. whom:** "Who" as the subject (e.g., Who conducted the study?). "Whom" as the object (e.g., To whom should we send the results?).

### 6.1.2. Third or Fourth Person Form Technical Writing Style

Technical Products must be written in third- or fourth- person form. A technical writing style, rather than a conversational style, must be employed.

A common mistake which will cause a technical document to be rejected and returned to the author is not writing the technical product entirely in third- or fourth- person form.

Table 1 below provides example of each form. Technical documents containing first- or second- person form will be returned to the author for revision and resubmission.

CASE			
FIRST PERSON	Subjective	Objective	Possessive
<i>Singular</i>	I	me	my/mine
<i>Plural</i>	we	us	our/ours
SECOND PERSON	Subjective	Objective	Possessive
<i>Singular</i>	you	you	your/yours
<i>Plural</i>	you	you	your/yours
THIRD PERSON	Subjective	Objective	Possessive
<i>Singular</i>	he	him	his/his
	she	her	her/hers
	it	it	its/its
<i>Plural</i>	they	them	their/theirs
FOURTH PERSON	Subjective Case	Objective Case	Possessive Case
<i>Singular</i>	one	any	one's
<i>Plural</i>	some/all	every	everyone's

**Table 1: Pronoun examples**

### 6.1.3. Active versus Passive Voice

Technical Products should be written in active voice wherever possible unless third- or fourth-person form cannot be adhered to with the active voice without detracting from the flow and clarity of the content.

*Example with active voice:* The project manager approved the schedule.

*Example with passive voice:* The schedule was approved by the project manager.

**Example where active voice where interferes with third-person form:** We completed the risk assessment today.

The example above should be edited to one of the following forms, depending its effect on clarity and flow in the document.

**Example with active voice (preferred):** The team completed the risk assessment today.

**Example with passive voice:** The risk assessment was completed today by the team.

#### 6.1.4. Grammar

Authors should ensure clarity, subject/verb agreement and parallel clause construction.

**Clarity:** Avoid vague language (i.e., generic language or generalizations). Use coherent paragraph structure. Avoid run-on or overly complex sentences.

**Subject/verb agreement:** The subject and verb should match in number form – if the subject is singular, then the verb should be also. If the subject is plural, then the verb should be also.

*Examples with singular nouns:*

The list is long.

The list of items is long.

*Examples with plural nouns:*

The lists are long.

The lists of items are long.

**Parallel clause construction:** Sentences should be structured with consistent use of parallel clauses.

*Examples related to coordinating conjunctions*

Incorrect: He likes to bike, run, and skiing.

Correct: He likes biking, running, and skiing

*Examples related to correlative conjunctions*

Incorrect: She is both smart and is kind.

Correct: She is both smart and kind.

*Examples related to comparisons:*

Incorrect: Running a marathon is harder than to swim a mile.

Correct: Running a marathon is harder than swimming a mile.

## 6.2. Abbreviations and Acronyms

**Abbreviations:** The use of abbreviations and acronyms (both technical and nontechnical) should be minimized unless necessary for clarity and style, and not to simplify the process

of writing. Use them where, in context, they can aid in clarity and lucidity of the document.

If necessary, commonly accepted abbreviations should be used. Abbreviations that are not commonly known should be defined in the document. In most cases, abbreviations should be in lowercase letters or with the first letter capitalized (e.g., Ave. for avenue; or psi for pounds per square inch).

**Acronyms:** Acronyms must be referenced in parenthesis immediately following the first use of the applicable term to which they apply. Acronyms should only be defined once even if they are used several times. Do not define an acronym if it is not used later in the document.

Most acronyms should be in all capital letters. The words comprising the acronym should not be capitalized unless they are proper nouns.

*Examples:* Monte Carlo simulation (MCS), critical path method (CPM)

Coined plurals or plurals of acronyms do not take the apostrophe as per [3].

*Examples:* CCT (singular); CCTs (plural)

### 6.3. Use of Capitalization

The AACE Technical Board discourages capitalization in text except where necessary.

**Document titles and headings:** For document titles and headings, capitalize the first word and all major words –not articles, prepositions, or coordinating conjunctions.

*Example:* Heading for Proper Use of Capitalization

**Sentence style:** Use sentence-style capitalization, which means that everything is lowercase except the first word and proper nouns.

**Nouns:** Proper nouns include the names of brands, products, and services, an individual person, place, or organization. The initial letter of proper nouns should be capitalized (e.g., Larry, Mexico, and Boston Red Sox). Common nouns are not to be capitalized (e.g., project manager, cost estimate, and procurement)..

*Example:* The project manager was the owner’s representative in dealing with contractor related issues.

**Titles and names:** Capitalize titles when they precede a name. Do not capitalize them when referring generally to the position.

*Examples:*

- The contract was signed by Chief Executive Director Johanna Smith.

- Johanna Smith is the chief executive officer of ABC Company.
- The Cost Estimating Subcommittee Chair is very knowledgeable.
- The subcommittee chairs need to be proactive.

**Specific groups, charts, publications:** Capitalize a specific item in a group, chart, or when referring to a specific publication.

*Examples:*

- AACE's cost estimate classification system consists of five classes (1-5). This paper describes a Class 3 estimate.
- AACE's recommended practices are widely known and respected.
- AACE Recommended Practice No. 34R-05, Basis of Estimate, discusses the importance of having a well-defined basis of estimate (BOE).

**Abbreviations:** See section 6.2 above.

#### **6.4. Periods and commas:**

**Use with quotes:** Periods and commas always go inside closing quotation marks. For parentheses or brackets, a period is placed inside if the entire sentence is enclosed within the parentheses or brackets. If the material is part of a larger sentence, the period goes outside. A comma should always go outside the parentheses, never inside, unless the comma is part of the parenthetical material itself.

*Example of punctuation with quotations:*

A base estimate is defined as "Estimate excluding escalation, foreign currency exchange, contingency and management reserves." [8, p. 12]

*Example of punctuation with parentheses for a full sentence:*

He finished the report. (It took him three days.)

*Example of punctuation with parenthesis for part of a larger sentence:*

There are many types of punctuation (e.g., periods, commas, parenthesis).

**The Oxford Comma:** The Oxford comma, also known as the serial comma, is the comma placed before the conjunction (usually "and" or "or") in a list of three or more items. The AACE Technical Board recommends utilization of the Oxford comma to improve clarity of technical documents. The Oxford comma prevents misinterpretation by clearly delineating each item in a list.



*Example with the Oxford comma:* We need to study data on temperature, pressure, and flow rates.

Without the Oxford comma, one could misread the clause as pressure and flow rates being a single item. Using the Oxford comma consistently throughout your document enhances readability and professionalism.

## **6.5. Semicolons and colons**

**Semicolons:** Use semicolons to link closely related independent clauses or to separate items in a complex list. If quotations are used, the semicolon goes outside the quotation marks.

*Example of a complex list:*

The study included participants from the US, Canada, and Mexico; used a mixed-methods approach; and spanned three years.

*Example of related independent clauses:*

The study included participants from multiple countries; however, all participants spoke the same language.

**Colons:** Use colons to introduce lists, explanations, or quotations after an independent clause. If quotations are used, the semicolon goes outside the quotation marks.

*Example:*

The research focused on three fundamental areas: methodology, data analysis, and interpretation of results.

## **6.6. Apostrophes and quotation marks:**

**Apostrophes for possession:** Use apostrophes to show possession.

*Singular noun:* Add 's (e.g., the researcher's findings).

*Plural noun ending in s:* Add only an apostrophe (e.g., the researchers' findings).

*Plural noun not ending in s:* Add 's (e.g., the organization's results).

**Apostrophes for contractions:** To maintain a formal tone, avoid contractions in technical writing (e.g., do not use "it's" for "it is").

**Quotation Marks:** AACE Technical Board recommends that quotation marks only be used for direct quotes. If an author wants to highlight or emphasize specific terms or phrases, italicized fonts should be used.

## 6.7. Hyphens and dashes:

**Hyphen and en dash:** In most word processing software packages, the hyphen and en-dash are represented using the same character (“dash”).

The dash can be used for hyphenation for compound adjectives, and to avoid ambiguity.

*Examples:* state-of-the-art equipment, well-known researcher.

Do not hyphenate compound modifiers occurring after the noun.

*Example with modifier before the noun:* The 6-mile-long roadway is under construction.

*Example with modifier after the noun:* The roadway under construction is six miles long.

The dash can be used as a traditional en dash when representing the word *to* or *through*, such as the case with ranges (e.g., pages 10-15, 2005-2024, 100-200 psi). If the word *from* is used in the text, the word *to* should be used instead of a dash (e.g., from 0 to 60 mph instead of from 0-60 mph).

**Em Dash:** Use em dashes for emphasis or to set off additional information, like the use of parenthesis. To create an em dash in Microsoft Word, type the following sequence: [pre-dash word, space, dash, space, post-dash word] – Microsoft will convert the dash to an em dash automatically.

*Example:* The results — unexpectedly — were significant.

## 6.8. Using numbers in text

### 6.8.1. Numbers:

The AACE Technical Board recommends consistency in the use of numbers, but also acknowledges that in some cases, “consistency must give way to readability” per Chapter 9.1 of [3].

Numbers beginning a sentence should be spelled out (except to denote a year).

Always use numerals for numbers written with units (e.g., 3 mi). Otherwise follow the convention below:

- 0 to 10: Numbers below eleven should be spelled out unless they begin a sentence or are combined in a range or with an abbreviated unit of measure (e.g., 8 to 12 times more, 1 in.).
- Hyphenate all compound numbers between twenty-one and ninety-nine.
- Numbers over ninety-nine should not be spelled out unless it is a whole number of a larger exponent.
  - *Correct:* The estimate was composed of 1,255 items.

- *Incorrect:* The estimate was composed of one thousand, two hundred fifty-five items.
- *Correct:* A millennium is a period of one thousand years.
- *Incorrect:* A millennium is a period of 1,000 years.
- Do not use a hyphen between numbers representing hundreds, thousand, etc.; and utilize a comma anywhere a comma would be used if writing the number with numerals.
  - *Correct:* one thousand, three hundred twenty-six
  - *Incorrect:* one-thousand three-hundred twenty-six

Numerals should always be used in the following scenarios:

- when followed by abbreviated units of measure
- when followed by the word percent or the percent symbol (%)
- when preceded by parts of a document (e.g. page, part, chapter, etc.)
- when preceded or followed by a symbol (e.g. \$1.50 or 8%)
- in dates (e.g. June 1, 1952; May 5; the 5th of May)
- in clothing sizes (e.g. size 10 dress)
- in expressions indicating severity (e.g. Category 4 hurricane)
- in scores or tallies (e.g. a 12-4 loss to the other team)

**Precision:** Use numerals for precise data (e.g., 3.14, 45%).

### 6.8.2. Ordinal numbers:

Using zeroth, first, nth, (k + 1)th, rather than 1st, 2nd, (k + 1)th, etc. is preferred. Ordinal numbers should not appear as superscript (e.g. 1st not 1<sup>st</sup>).

### 6.8.3. Millions, billions, and trillions:

As stated in Section 4.3 Language and Spelling, the official language for all AACE International technical documents is US English. Most English-speaking countries utilize the short scale for naming large numbers. Authors should adhere to the short scale, even if their native country or language is not English. A side-by-side comparison of the short-scale and long-scale systems for naming large numbers is provided in Table 2. AACE technical documents should utilize **short scale names**.

Value	Short Scale Name	Long Scale Name
-------	------------------	-----------------

Base 10	Base 1,000	Name	Base 1,000,000	Name
$10^6$	$1,000^2$	million	$1,000,000^1$	million
$10^9$	$1,000^3$	billion		milliard
$10^{12}$	$1,000^4$	trillion	$1,000,000^2$	billion
$10^{15}$	$1,000^5$	quadrillion		billiard
$10^{18}$	$1,000^6$	quintillion	$1,000,000^3$	trillion
$10^{21}$	$1,000^7$	sextillion		trilliard
$10^{24}$	$1,000^8$	septillion	$1,000,000^4$	quadrillion
$10^{27}$	$1,000^9$	octillion		quadrilliard

**Table 2: Short scale versus long scale for naming large numbers**

If the short scale names need to be abbreviated, abbreviations shown in Table 3 should be utilized.

Value Base 10	Short Scale Name	
	Name	Abbreviation
$10^3$	thousand	K
$10^6$	million	M
$10^9$	billion	B
$10^{12}$	trillion	T
Greater than $10^{12}$	Quadrillion and above	Do not abbreviate

**Table 3: Short scale numbers and abbreviations**

#### 6.8.4. Percentages

Always use the number and the percent sign when dealing with percentages. The percentage symbol is repeated in lists and ranges.

*Examples:*

- Only 2% of the risks were realized.
- The mechanical projects from the last five years made up 20%-30% of the project population for historical database development.

#### 6.8.5. Decimals and Fractions

**Decimals:** When using decimal numbers in text, include the zero before decimal (e.g., 0.25 not .25). Do not include the zero(s) after the last digit following a decimal (e.g., 0.8 not 0.80) unless ending zero is intended to show precision or significant value of analysis.

**Fractions:** Simple fractions should be spelled out in hyphenated form regardless of part of speech.

### *Examples:*

- The contractor has completed two-thirds of the clearing scope.
- One-half of the labor force is on strike.
- A two-thirds majority is required.

Compound fractions can be expressed using figures (e.g. 7 ¼ units).

In text, fractions may be broken down (shilled) on one line or built-up on multiple lines. Sometimes parentheses may need to be added to distinguish between expressions, especially when a minus appears [e.g.,  $\frac{c-d}{k+4}$  becomes [(c-d)/(k+4)]. This may be done to save space.

If writing numbers in a mathematical context, see additional guidance in Section 5.5.

## **6.9. Units of Measure**

It is important for units of measure to be used consistently in the document, either metric or imperial. There is no need to convert the naming of common items, such as 6" diameter pipe, to metric equivalents.

Plurals of units of measure take the "s" without an apostrophe. For example, the plural form of 3 mil is 3 mils: 3 bits/s instead of 3 bit/s.

When reporting ranges, there should be no unit after each number unless the units are different: 40–50 mm; 50 inches to 7 feet; 2x4 inch lumber.

Spell out units used in text without quantities (e.g., "where the noise is given in decibels"). Units used as compound adjectives may be hyphenated only if needed for clarity: 10-kV voltage, 5-in-thick glass. Do not insert a hyphen when they are not used as adjectives: a current of 2 A, a line 4 in long, a length of 3.05 mm.

## **6.10. Currency**

When specifying currency, use the appropriate currency symbol before the number; and do not include the name of the currency after the number (e.g., \$4,503 not \$4,503 dollars). When possible, maintain the same currency units throughout the document.

## **6.11. Dates and times**

**Dates:** Authors should write the long form of a date with the month spelled out (e.g., September 24, 1956); or use international date format convention of "yyyy-mm-dd" (1956-09-24). Written form of dates should be consistent throughout the document.

The plural of calendar years does not take the apostrophe before the "s." For example, the plural form of 1990 is 1990s – not 1990's.

**Times:** To indicate the time of day, use figures with a colon to delineate minutes followed by a space and the indication of am or pm in lowercase letters (e.g., 9:00 am, 12:42 pm). For clarity, use noon and midnight instead of 12:00 pm and 12:00 am.

## References

- [1] H. L. Stephenson, Ed., Total Cost Management Framework: An Integrated Approach to Portfolio, Program and Project Management, 2nd ed., Morgantown, WV: AACE International, Latest revision.
- [2] AACE International, Recommended Practice No. 10S-90, Cost Engineering Terminology, Morgantown, WV: AACE International, Latest revision.
- [3] The Chicago Manual of Style, 18th ed., The University of Chicago, 2024.
- [4] IEEE Editorial Style Manual for Authors, V 11.12.18 ed., Piscataway, NJ: IEEE Periodicals, 2018.