The Levels of Edit

Second Edition

society for technical communication

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Foreword

The Levels of Edit was first published at the Jet Propulsion Laboratory (JPL) in March 1976. It was reviewed in several periodicals in the field of communication, and JPL began to receive requests for copies of the booklet. In 1980, when the second edition of *The Levels of Edit* was published, the Government Printing Office (GPO) agreed to sell copies so that the booklet could be more widely available. The GPO supply became depleted, however, and for some years there was no real source for obtaining the *The Levels of Edit,* since JPL could not sell it and could not give it away, except on a single-copy, peer-group-exchange basis.

With this facsimile reprint of the second edition, *The Levels of Edit* is now available as an STC publication. No changes have been made in the booklet since it appeared in 1980. It can be adapted for use as needed, since the levels-of-edit concept was designed from the beginning to be adaptable to the individual needs of different publications organizations.

The Society for Technical Communication thanks the Jet Propulsion Laboratory for making *The Levels of Edit* available as an STC publication.

Preface to the Second Edition

The Jet Propulsion Laboratory (JPL) publishes reports for external distribution describing the work that is performed by the Laboratory in such areas as unmanned space exploration, energy, medical engineering, and transportation.

Since March 1976, when the first edition of *The Levels of Edit* was published, the booklet has been used by publications people at JPL and by others in the field of technical communication. During this time, changes have inevitably come about. Although the levels-of-edit concept remains basically the same so far as our practice is concerned, the changes have made the original edition of the booklet obsolete in several details. These details reflect developments in JPL usage and thus should not have any real effect on users of the booklet outside the Laboratory.

One of the most significant changes in this second edition is reflected in Table 1, where a Language Edit has now been included in Level 2. After more than three years of experience with the original classifications, it has become apparent to us that Language Edit is more closely associated with Mechanical Style than with Substantive Edit: a Language Edit is often required when a Substantive Edit is not. But this does not mean to imply that a Language Edit is a mechanical process; on the contrary, it is as flexible, as variable, as creative as the language itself. Indeed, of all the editorial activities described here, the Language Edit poses some of the greatest challenges to the technical editor.

During this period, the nomenclature of Laboratory publications was also changed: the categories of Technical Report and Technical Memorandum were eliminated in favor of a product called a JPL Publication. This required several text modifications in *The Levels of Edit* and the deletion of a table.

A few additions and clarifications have been made in several of the types of edit, and in this edition the types as a group have been removed from their former Appendix position and integrated into the body of the discussion. Some additional examples of the distinction between format and style have been included in this edition.

We have also received many interesting and helpful comments from users of *The Levels of Edit*. One of the comments received after publication of the first edition was a question concerning the need for such a fine distinction between format and mechanical style. After all, what difference does it really make whether a particular instance of capitalization, say, is called *format* or *style*? The

answer is that such distinctions are what make the levels-of-edit concept work, at least for us. If an editor is required to do a Format Edit, but not a Mechanical Style Edit (as often happens), the editor must know exactly what to do and what to leave undone. The Mechanical Style Edit lifts the effort into another level of edit (from Level 3 to Level 2) and could increase the cost. If the job is estimated on the basis of a Level 3 edit, the editor may overrun the estimate—with no justification—if he or she does not know the precise limits of the effort required.

The first edition elicited several comments about the use of the word "edit" as a noun. The latest edition of *Webster's New Collegiate Dictionary* defines the noun "edit" as "an instance of editing," and this is the sense in which we use the term. Since *The Levels of Edit* is an attempt to quantify the editing process, the noun is used in order to denote this quantification.

As a result of the inquiries and correspondence following the publication of the first edition, we have concluded that the same kinds of editorial problems exist wherever there is a publications department, and that editors and other publications people are looking for the same answers throughout the industry. We don't think that *The Levels of Edit* provides the answers to all or even most of these problems. We do hope, however, that it makes a contribution, especially in fostering the use of a standard nomenclature. The word "edit," for example, is as confusing in general usage as the world "style," and both are used indiscriminately to mean many different things. If publications people could talk to each other in a common language, perhaps some of our problems would disappear.

R.V.B.
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Contents

Abstract

The editorial process is analyzed, and five levels of edit are identified. These levels represent cumulative combinations of nine types of edit: Coordination, Policy, Integrity, Screening, Copy Clarification, Format, Mechanical Style, Language, and Substantive. The levels and types of edit, although developed for specific use with external reports at the Jet Propulsion Laboratory, cover the general range of technical editing, especially as it applies to an in-house technical publications organization. Each type of edit is set forth in terms of groups of actions to be performed by the editor.

The edit-level concept has enhanced understanding and communication among editors, authors, and publications managers concerning the specific editorial work to be done on each manuscript. It has also proved useful as a management tool for estimating and monitoring cost.

I. Introduction

This report discusses some aspects of the editorial process from the viewpoint of technical editing. By "technical editing" we mean here the editing of manuscripts that are written about scientific or engineering subjects, particularly as it is performed in an in-house technical publications organization.

Technical editing is a rather inconsistently defined endeavor: every organization imposes its own pragmatic requirements on the technical editor. Probably the main characteristic of the editorial process is the fact that the quality of the effort—the depth to which it is performed—is contingent on other priorities such as time and money.

The technical editing process is often thought of as a "manuscript polishing" job—the cosmetic finish to a manufactured product, the final stage in the process of fabrication. To many an author, the editor is someone who "fixes up the grammar." To others, the editor is one who, for all his good intentions, may only distort the carefully constructed technical message. To some organizations, the editor is a watchdog who guards the published image of the firm; to others, he is there merely to provide a service to the author. The real scope of the technical editing function, however, is not so easily dismissed; for, as this report will show, technical editing involves a wide-ranging, deeply probing, thorough review of a technical manuscript and is performed for the purpose of improving the communication of scientific and engineering concepts. In fact, many authors consider the technical editor to be one who can be relied upon to transform a mass of rough draft material into a polished and publishable report.

One of the difficulties of technical editing, and at the same time one of the accomplishments, is the fact that it must deal with a tremendous variety of technical information. Certainly the technical editor cannot be expected to be an expert in physics, chemistry, electronics, and mathematics; yet he may work on manuscripts in all of these disciplines. Nevertheless, with a knowledge of the mechanics of writing and publishing, by the use of a great deal of logic mixed with some common sense, and with a certain amount of "editorial acumen," he can enhance a technical manuscript to the benefit of both author and reader.

What, then, does an editor do? How does an organization tell an editor what his functions and responsibilities are, and what can an author expect when he turns in a manuscript? How much should a technical edit cost? How much time should it take?

This report describes an effort to answer these questions by analyzing the editorial process and imposing upon it a sense of organization and rationality. Experience at JPL thus far indicates that the result of this effort—the levels-of-edit concept—benefits author, editor, and manager alike.

The application of this concept has, first of all, improved communication among those who must talk about technical editing. The manager can tell the editor more precisely what he is expected to do under various conditions. The editor can tell the author what will be, or can be, done to his work, giving the author options that are clearly defined and understandable. Second, it has taken the cost of editing out of the realm of enraged surprise and put it within the scope of estimation and accountability. The editor can now define a detailed scope of work and, having done so, can spotlight, and bring to the author's attention, changes to that scope which will affect the cost. More than this, the editor can offer to the author a choice of costs, based on a choice of edits. Third, the organization can develop a hierarchy of publications products based upon the various levels of edit, or it can describe different editorial efforts to be applied on the basis of whatever parameters it chooses. Fourth, discussions about schedules can be kept objective by being related to the specific editorial effort involved, and trade-offs can be considered in exactly the same manner as for an engineering design. Fifth, the levels of edit provide an ideal instrument for training new editors and for appraising editorial performance, since the editor's duties are specified in concrete terms. Finally, an author can use the levels of edit to obtain a given level of quality at a lower cost and in a shorter turnaround time by performing some of the editorial functions himself in preparing the manuscript.

It is the position of the Jet Propulsion Laboratory that its publications will receive the most thorough edit possible, and that the only reasons for applying less than a thorough edit are the practical constraints of time and money. The levels-of-edit concept makes it possible to back away from the full treatment in

an orderly fashion, so that a publication will still receive the highest level of edit consistent with the time and money constraints imposed upon it.

The following sections describe the levels-of-edit concept and tell how the edit levels are constructed. They also contain brief discussions about the manuscripts that are submitted to an editor and about some elements of format and style. The last section contains a detailed description of the different types of edit that may be performed on any one publication. Wherever possible, the rationale for making specific assumptions or decisions has been presented as well, so that readers in other organizations may modify the approach to fit their own needs.

II. The Levels-of-Edit Concept

To analyze the editorial process at JPL, as many as possible of the editorial functions performed at the Laboratory were listed and grouped into nine basic categories. These categories, which we call "types" of edit, are different enough from each other to stand alone as separate and distinct applications of the editorial process. The nine types of edit are

(1) Coordination

(2) Policy

(3) Integrity

(4) Screening

(5) Copy Clarification

(6) Format

(7) Mechanical Style

(8) Language

(9) Substantive

Each of these types of edit consists of a number of specific editorial functions (see Section VI). Five cumulative combinations of the types of edit, as performed at JPL, have been identified as levels of edit (Table 1).

Table 1. Types and levels of edit

Type	Level of edit				
	1	2	3	4	5
Coordination	X	X	X	X	X
Policy	X	X	X	X	X
Integrity	X	X	X	X	
Screening	X	X	X	X	
Copy Clarification	X	X	X		
Format	X	X	X		
Mechanical Style	X	X			
Language	X	X			
Substantive	X				

At JPL, the external institutional publications are divided into classes that designate, in general, the level of their physical quality and appearance. A Class A publication is usually typeset, with justified columns, the artwork is integrated with the text, and the publication is printed and bound using high-quality materials and techniques. The format of Class A publications is institutionally determined.

A Class B publication is usually typewritten, with unjustified columns, the illustrations and text appear on separate pages, and the publication is printed and bound using more economical materials and techniques. The format of Class B publications is also institutionally determined.

Class A and B publications are received by the editor in manuscript form and are composed by publications personnel.

A Class C publication is not composed by publications personnel but is processed by them as camera-ready or nearly camera-ready copy. Format considerations are relaxed in Class C publications.

As indicated in the descriptions above, JPL is also involved in a variety of composition methods. These methods include conventional hot-lead typesetting, computer-assisted typesetting (photocomposition), computer-assisted manuscript processing, and typewriter composition.

The variety of both the classes of publications and the methods of composition was an influential factor in determining the kind and number of levels of edit suitable to the Laboratory's publication requirements. These considerations are evident in the following brief description of how the levels are applied at JPL.

In a Level 5 edit, the editor verifies that JPL policy has not been violated, routes the manuscript through the various production processes, and performs a liaison function between the author and publications personnel. The Level 4 edit applies mainly to publications produced from camera-ready copy submitted by the author, and ensures that the material meets the minimum requirements for a JPL publication. On the other hand, if the material is not camera-ready, it will have to go through a composition process, and the editor, performing a Level 3 edit, will be required to clarify the copy for the compositor and to indicate the format. The Level 2 edit is often used for such publications as journal articles and meeting papers, where a specific mechanical style is required by the publisher. And in a Level 1 edit, the full range of editorial capabilities is applied to produce a first-class publication.

The types of edit listed in Table 1 may be used independently, or in some combination of the types of edit that does not fit one of the edit levels; for example, an author may require an Integrity Edit and a Language Edit and nothing more. In such a case, the two types of edit would be performed without reference to the levels of edit. But this approach is valid only for those manuscripts that do not have an institutionally imposed minimum level of edit; e.g., manuscripts that are being edited for review or management approval or for the open literature. Otherwise the institutional requirement concerning the appropriate level of edit would govern.

There is, however, a definite advantage in combining the types of edit into various levels, since the levels relate to the kinds of products published, the quality of those products, and the cost.

III. Extraordinary Editorial Functions

For one reason or another, each of the editorial functions listed below requires more time and effort than is normally expended in editorial processing at JPL. These functions are not considered part of a normal edit and therefore are not included in the types of edit discussed in Section VI. They are also not included in a normal estimate; if it is known in advance that any of these functions will be required, the original estimate is adjusted accordingly. If, on the other hand, such a need develops as the editorial work is in progress, the additional effort may indicate a change in scope that should be reflected in a revised estimate.

Extraordinary editorial functions include the following:

(1) Providing additional or missing material.

  (a) Researching references, if more than a minor effort is involved.

  (b) Writing, other than minor or occasional passages.

  (c) Locating missing items such as figures.

  (d) Collecting data or examples of previous publications to provide authors with material for decision-making.

(2) Working with unusually difficult or time-consuming material.

  (a) Editing copy written in a foreign language.

(b) Editing copy written by a foreign-born person who is not familiar with idiomatic English usage.

(c) Editing transcribed tapes.

(d) Editing handwritten manuscripts, particularly those containing mathematics.

(3) Performing repeated operations on material.

(a) Handling multiple iterations of a manuscript.

(b) Incorporating more than one series of author changes to a manuscript or to any element, such as a table or figure, if more than a minor effort is involved.

(4) Editing for technical content.

(a) Combining two or more manuscripts on the basis of technical content.

(b) Reducing the length of a manuscript on the basis of technical content.

(c) Verifying the accuracy of technical data.

(d) Calculating International System (SI) unit conversions from customary or English units.

(e) Identifying and correcting inconsistent use of mathematical symbols.

(5) Performing unusually time-consuming services.

(a) Dealing directly with more than one author.

(b) Handling incremental input.

(c) Dealing with out-of-town authors.

(d) Making trips away from JPL for the purpose of

(i) Making pickups or deliveries.

(ii) Conducting author reviews.

(iii) Performing quality control checks on vendors' premises.

IV. The Condition of the Manuscript

One of the most influential factors affecting the time and cost of the editorial effort is the condition of the manuscript. We mean here not so much the physical condition, although that obviously has an effect, but the quality of the content. Consider two manuscripts, both clean and neatly typewritten. The first is well prepared and requires very few blue-pencil marks by the editor. The second is poorly prepared, and nearly every line contains some editorial changes. Let us further assume that the editor has performed a Level 1 edit in each case.

Although the editor has performed the same level of edit in both cases, he has spent far less time on the well prepared manuscript than he has on the poor one. It is apparent that the level of edit alone does not determine the level of effort required. In fact, for any given level of edit, the condition of the manuscript has a decisive effect on cost and schedule.

The quality of the manuscript, then, is fully as important as the cost and schedule constraints and the specified level of edit in determining the amount of editorial effort required.

To sum up:

(1) Each level of edit consists of a range of effort from minimum to maximum, depending on the condition of the manuscript.

(2) The condition of the manuscript has a decisive effect on cost and schedule.

(3) The level of edit defines the quality of the end product but not the effort required to achieve it.

V. A Word About Format and Style

The levels-of-edit concept makes a distinction between a Format Edit and a Mechanical Style Edit. In order to be able to assign specific editorial functions to one or the other type, and also to be able to use them effectively, one must have a precise criterion for distinguishing between them.

The difference between format and style is sometimes difficult to discern, particularly in those areas where they overlap. The confusion probably arises because any format guide, in showing examples of the required format, must incorporate *some* use of mechanical style. For instance, a format guide might show a sample of the format for listing indents like this:

(1) _____

(a) _____

But the sequence symbols (1) and (a) are matters of style, not format, as explained below. Nonetheless, the format guide must use *some* kind of sequence symbol in its demonstration in order to make its point, and those symbols may be taken as part of the "requirement." By extension, they may erroneously be considered as elements of format.

Another source of confusion lies in the fact that some uses of mechanical style may be mandated by the organization while others may be allowed to vary. The use of roman numerals for first-order headings may be required by the organization, for example, whereas initial capping of the word "Sun" may be left to the discretion of the author or editor. The fact that both these items are stylistic is overshadowed by the fact that one is mandatory and the other is not. From here, it is but a small step to the erroneous conclusion that one is format and the other is style.

The distinctions between format and style made here are admittedly arbitrary, but we believe that these distinctions, applied rigorously, can clarify much of the confusion concerning the difference between the two.

Format concerns the visual aspect. It answers the question, "What does it look like?" The positioning of type on a page, the location of a heading, the size of the book itself, the visual image of the type face—its size and shape—are all matters of format. Format deals with the aesthetic or design aspects of a publication, and format decisions are based primarily on subjective, artistic judgments. Whether to use News Gothic or Futura, justify or not justify, have two columns or one column, put a leading space here or there, center a heading, position a page number to the right or left—all of these decisions affect the visual impact of the publication.

Mechanical style, on the other hand, is related to the content of the publication. Stylistic decisions are based more on meaning than on form; they deal with symbols that represent meaning. Whereas format is concerned with the selection of an entire type face (say, Bodoni), for example, mechanical style deals with the selection of particular characters (e.g., a boldface capital A to represent a vector). The choice of a symbol, a letter, a word, or a phrase is a stylistic choice.

When a heading in text, or a variable term in a scale label on a graph, is written in capital letters, we are talking about format, but when a unit of measurement is written in capitals, such as V for volts, we are talking about mechanical style. Why is this so? Capitals are capitals, after all. The answer is that in the one case we use capitals *no matter what letters are involved*, while in the other case we use capitals *only for certain letters*, depending on the meaning or content of the expression.

In an effort to illustrate the distinction between style and format, some of the areas in which they are often confused are listed in Table 2.

Table 2. Some distinctions between format and style

Area	Format	Style
Headings	Set in a special type font and/or type size Centered or flush left All caps or initial caps On separate line or run into text	Marked with roman numeral, arabic numeral, decimal number, letter, or unmarked
Listings	Amount of indention Runover lines blocked or indented Lines single-spaced or leaded	Sequence indicated by lowercase letters, arabic numerals, or lowercase roman numerals Periods, single parentheses, or double parentheses used with sequence symbol
Page numbers	Set in a special type font and/or type size Position on page	Use of lowercase roman numerals, arabic numbers, or two-part (i.e., chapter and page) numerals
Figures	Use of all capitals for callouts as a design feature Integrated into text, placed on separate pages and interleaved, grouped at end of chapters, or placed at end of report	Selection of particular symbols, words, and phrases in callouts to make the style of the call-outs consistent with that of the text
Captions	Set in a special type font and/or type size Placed above or below figure or table Blocked or pyramided or shaped in some other way Justified or unjustified	Designated as Figure, Fig., Exhibit, Plate, Sketch Numbered or unnumbered One- or two-part numbers used
Footnotes	Set in a special type font and/or type size Placed at bottom of page or grouped at back of report	Methods of sequencing (by chapter or continuously) Sequence indicated by arabic numbers, letters, or other symbols (e.g., asterisks, daggers)
Scale labels on graphs	Positioning of label to be right-reading or turned Shape of label, such as a variable term, followed by a mark of punctuation, followed by a unit of measurement (e.g., DISTANCE, m) Variable term written in all caps	Choice of a particular mark of punctuation Choice of particular symbols for units of measurement
Math	Use of em vs piece fractions Centering or other positioning of equations Size of summation, integral, parentheses, bracket, and brace signs Juxtaposition of inferiors and superiors	Use of fractional exponents vs radical signs Use of italics for letter symbols, boldface for vectors Selective use of solidus vs fraction bar

VI. The Types of Edit

The editorial functions that appear in this section are those that are performed by technical editors at the Jet Propulsion Laboratory. JPL editors do not deal directly with typesetters, printers, art vendors, and other subcontractors but obtain their services through a production department, where technical expertise in these areas is concentrated. Production decisions are made by editors only from a purely editorial point of view. For this reason, certain production functions are not included under the types of edit specified here. However, the editors are involved in more aspects of the publication process than merely the pure editorial function. For instance, they are responsible for budgets, costs, schedules, and liaison; in effect, they manage a complete job from start to finish. This fact has had a significant effect on the kind of editorial functions included.

The nine types of edit—Coordination, Policy, Integrity, Screening, Copy Clarification, Format, Mechanical Style, Language, and Substantive—are discussed below. Because they are combined cumulatively, the edit types are listed here in the order of increasing levels (see Table 1).

A. Coordination Edit

Coordination Edit consists primarily of manuscript handling and job monitoring and control. It includes

(1) Planning and estimating

(a) Attending planning meetings.

(b) Formulating job parameters and specifications.

(c) Preparing estimates.

(d) Gathering cost data, such as cost-to-date or cost-to-complete.

(2) Record maintenance

(a) Maintaining records such as status reports, job chronologies, and time distribution.

(b) Verifying the existence of written authorization for any color printing.

(3) Scheduling and schedule follow-up.

(4) Manuscript markup

(a) Marking document number and page numbers on manuscript.

(b) Marking each piece of artwork with document number and figure number and, in multiple-article publications, with the article identification.

(c) Specifying the publication date that is to be printed on the cover.

(d) Distinguishing between vendor errors and JPL changes in order to determine cost liability.

(5) Monitoring and liaison

(a) Monitoring and coordinating production processes and interfaces, preparing work requests, and communicating job requirements to support groups.

(b) Maintaining contact with authors on questions of input timeliness, turnaround time for review, publication schedules, current status, and the like.

(c) Holding author checks of edited manuscripts when applicable.

B. Policy Edit

A Policy Edit is applied in its entirety to JPL Publications. Part or all of the Policy Edit is also performed on other publications as specified by management. The purpose of a Policy Edit is to make sure that a publication reflects the policy of the Jet Propulsion Laboratory.

A Policy Edit ensures that

(1) The following required report elements are present:

(a) Cover and title page

(b) Spine (if necessary)

(c) Credit statement

(d) Table of contents

(e) Abstract

(f) Half title (where required)

(g) Page numbers

(h) Figure captions

(i) Table titles

(2) There are at least two first-order headings in the report.

(3) The Table of Contents contains at least the first-order headings and all table and figure captions.

(4) References, if any, are complete enough to allow the reader to locate the publication referenced.

(5) Internal JPL documents in references are so identified.

(6) International System (SI) units of measurement are used in conformity with directives from NASA (Ref. 1) and JPL.

(7) No derogatory or otherwise inappropriate judgmental comments are included that would reflect adversely on private companies, government agencies, other investigators, or subdivisions within JPL.

(8) No statements are included that would tend to advertise, endorse, or promote the products or services of a company.

(9) Covers, title pages, credit statements, logos, and front matter conform to JPL requirements.

(10) JPL Publications that report NASA research do not contain disclaimers.

C. Integrity Edit

An Integrity Edit is concerned primarily with ensuring that the parts of a publication match. For example, if "Figure 1" is cited, an Integrity Edit will determine whether Figure 1 is included in the report. However, an Integrity Edit will not resolve any apparent inconsistencies or contradictions in the meaning expressed in different parts of the report. Such discrepancies are discussed in Substantive Edit (see Section VI-I).

Similarly, an Integrity Edit verifies that there are no gaps or repetitions in a numbering system: if 10 figures are cited, they are numbered, both in text and on the figures themselves, from 1 through 10. This type of edit does not, however, determine that the citations occur in sequential order; the sequential ordering of figures and other numbered elements in a report is a part of Mechanical Style Edit (Section VI-G below).

An Integrity Edit ensures that

(1) The Table of Contents agrees (in wording and in all elements of mechanical style) with headings, figure captions, and table titles in the publication. Explanatory material, however, especially in figure captions and table titles, need not be included in the Table of Contents.

(2) Page numbers for elements listed in the Table of Contents agree with the actual page numbers for those elements in the body of the publication.

(3) Each table, figure, reference, footnote, and appendix is cited in the text, and each text citation identifies an existing table, figure, reference, footnote, or appendix.

(4) There are no incorrectly numbered or lettered sequences; i.e.,

  (a) No two tables, figures, references, equations, footnotes, sections, paragraphs, or subparagraphs have the same number or letter designation, and there are no numerical gaps in the sequences.

  (b) Any numbered or lettered sequence is consistent in the kind of numbers or letters used (e.g., roman numerals, arabic numbers, hyphenated numbers, decimal numbers).

(5) No two figure captions or table titles are identical.

(6) When a reference (citation) is made to another text element (e.g., section, paragraph, subparagraph), either by title or alphanumeric designation or both, that text element actually exists.

(7) Copy for the spine, if any, is consistent with the information on the cover.

(8) The nonvariable elements in a publications series (e.g., publication number, main title) are expressed identically, and the variable elements (e.g., volume designation, subtitle, spine copy) are expressed in a consistent manner throughout all volumes or parts of the series.

(9) The dangers of describing the specific content of future volumes in a series (e.g., in the Preface or Foreword) are brought to the author's attention.

(10) The subject matter of a current volume in a series agrees with any reference to it that may appear in earlier volumes; if not, appropriate clarification is made.

(11) References to other publication elements (e.g., other figures or tables) are removed from the artwork for slides and viewgraphs with the author's concurrence.

D. Screening Edit

A Screening Edit represents the minimum editorial standard that is considered acceptable in a JPL external report. Such an edit identifies and corrects aspects of the text (e.g., misspelled words) and artwork (e.g., handwritten lettering) that are unacceptable.

A Screening Edit ensures that

(1) All words are spelled correctly.

(2) Subjects and verbs agree.

(3) All sentences are complete.

(4) Incomprehensible statements, such as those that result from missing material, are clarified.

(5) Figures intended as camera-ready input contain no handwritten or unreproducible lettering.

(6) Ordinates and abscissas are labeled on graphs.

(7) Titles are not included within a figure (as they are in a viewgraph).

(8) Photographs intended as camera-ready input have not already been screened. (If the only existing photograph is a halftone, the editor consults with graphics personnel to determine whether the figure is usable.)

E. Copy Clarification Edit

Copy clarification is an editorial process that clarifies illegible material or reworks uncomposable text or unproducible artwork in order to give clear instructions to keyboarders (including typists and typesetters) and graphics personnel. A Copy Clarification Edit includes:

(1) Clarifying unreadable copy.

(2) Marking end-of-line hyphens for retention or deletion wherever necessary to avoid misinterpretation.

(3) Deleting unwanted underscores.

(4) Indicating table rules.

(5) Marking mathematics, including

   (a) Identifying and marking symbols and Greek letters as necessary.

   (b) Indicating subscript and superscript positions.

   (c) Indicating acceptable equation breaks.

   (d) Rearranging material to facilitate composition (e.g., using "exp" to avoid a cumbersome exponent, turning fractions, etc.)

(6) Indicating inking requirements on the manuscript, galleys, printouts, and facsimile copy.

(7) Coding text for photocomposition.

(8) Marking the tops of figures if the orientation is not obvious.

(9) Indicating crop marks on photographs if the desirable image area is not obvious.

(10) Indicating to graphics personnel the degree to which detail must be preserved in sizing a figure for reduction.

(11) Obtaining from the author the negative numbers, originals, or previous publication numbers in order to re-use figures that have already been produced.

(12) Indicating the parts of a figure to which callouts apply when this information is ambiguous, so that the illustrator may move copy for better fit.

(13) Miscellaneous marking to indicate special requirements, usually at the request of the author, such as specified tick marks or gap indications in graphs (ϟ) when these requirements are such that analysis or interpretation is not required on the part of the editor.

F. Format Edit

In a Format Edit, the editor provides instructions for both text and figures to ensure conformity with the appropriate format. These instructions include the following:

(1) Typography

   (a) Basic type face specifications, including the use of italics, boldface, script, or other special fonts in non-content-related distinctive treatment for design purposes.

   (b) Leading (spacing) specifications.

(c) Column width.

(d) Form and position of headings and captions (capitalized, lowercase, centered, side, run-in, blocked, justified, inverted pyramid, etc.).

(e) Form and position of cover, spine, and title page copy.

(f) Indention requirements for paragraphs, headings, and listings.

(g) Mode specification (justified or unjustified).

(h) Position of runover lines in headings, listings, tabular column heads, tabular columns, etc.

(2) Layout

(a) Continuity instructions (i.e., where necessary, the editor indicates whether a publication element or section is to be started on a new page).

(b) Positions of figures and tables: either integrated into the text, gathered at the ends of sections, or gathered at the end of the publication. This includes the layout of figures and tables (grouped, on facing pages, etc.) where such layout is requested by the author.

(c) Requirements for or prohibitions against landscape or foldout figures and tables.

(3) Figures and visual aids

(a) Column width, image area, lettering font, and minimum lettering size specifications.

(b) Position of runover lines in figure callouts.

(c) Form and position of ordinate and abscissa scale labels.

(d) Requirements for skeleton pages or figure sizing lists.

(e) Position of titles on slides or viewgraphs.

(f) Type and size of slides or viewgraphs (e.g., special marking; glass encasing for 35-mm slides; negative slides or viewgraphs; color requirements).

At JPL there are many format decisions that have been standardized and so are not individually specified by the editor. This is particularly true for layout and for many elements of format relating to artwork. Graphics personnel are responsible for format decisions concerning such items as line weights, symbol sizes, lettering fonts, placement of double scale labels, handling of legends, boxing in of figures, positioning of multi-part figures, use of screens, handling of suppressed-zero grid breaks, presentation of logarithmic scales, cropping, use of standard

symbols, treatment of facsimile copy such as computer printouts, illustration sizing, photograph retouching, and others.

For the most part, these considerations are independent of the context, and so are properly design (format) considerations. Such elements of format, which are not normally of concern to the editor, are not listed here as part of the Format Edit. However, the editor may override any standardized format requirement if this is necessary to convey the meaning properly.

G. Mechanical Style Edit

The Mechanical Style Edit is performed to bring the mechanics of the text and figures into consistent conformity with a specified style. Such mechanical aspects include, for example, capitalization, abbreviations, use of numbers, use of bold face and italics for symbols, and sequencing of reference, figure, and table citations.

For JPL Publications, the basic reference for mechanical style is the *U.S. Government Printing Office Style Manual* (Ref. 2). For other publications (e.g., a journal article or meeting paper), mechanical style will follow whatever guidelines are furnished by the journal, the meeting organizers, or the author.

Where there are no style guidelines, and with the concurrence of the author, the editor may (1) use Ref. 2 or (2) in manuscripts with inconsistent style, standardize on the stylistic choices used in the majority of instances.

The Mechanical Style Edit ensures appropriate and consistent style in the following areas:

(1) Capitalization related to content (as contrasted with all-caps format in headings or figures; e.g., "Earth" vs "earth").

(2) Spelling (e.g., "disk" vs "disc"). Note that correct spelling is specified in the Screening Edit, but there is no requirement in the Screening Edit for consistency between two acceptable forms.

(3) Word compounding (e.g., "non-parallel" vs "nonparallel"), including treatment of hyphens in unit modifiers (e.g., "solid state" vs "solid-state" as unit modifier).

(4) Form (words vs digits) and construction (nouns vs adjectives) of numerals (e.g., level one, level 1, first level).

(5) Form and use of particular symbols, letters, words, or combinations thereof, including acronyms and abbreviations (especially units of mea-

surement). Includes the use of alphanumeric or other symbols in headings, listings, and paragraphs to indicate sequence and/or subordination.

(6) Bibliographic reference style, including sequencing of the elements of each reference (i.e., author, title, etc.).

(7) Use of italics, bold face, script, or other special fonts in content-related distinctive treatment of particular letters, symbols, or words.

(8) Sequential appearance of citations and of the elements cited, such as references, equations, figures, tables, footnotes, and appendixes.

(9) Horizontal spacing between letters, symbols, and words, and around mathematical operators (+, =, >, etc.).

(10) Use of project or organization nomenclature.

(11) Callouts used to identify curves, data points, ordinates, and abscissas on figures.

(12) Presentation of comparable material from slide to slide or viewgraph to viewgraph in a series of visual aids.

H. Language Edit

The Language Edit is an in-depth review concerned with the way in which the ideas in a report are expressed, regardless of the format (e.g., type font) or mechanical style (e.g., capitalization). The Language Edit may be performed separately, without other types of edit. This may happen, for example, in a type of editorial assistance offered when an author wishes to have the language polished in a manuscript before he submits it to his management for approval. The editor returns the edited manuscript to the author, who arranges to have it typed. In this kind of editorial assistance, it is important to remember that the pure Language Edit does not include marking for mechanical style or for format.

All editorial changes in a Language Edit are made on the basis of specific and identifiable reasons rather than the personal preferences of the editor. A Language Edit covers the following areas:

(1) Spelling, according to *Webster's Third New International Dictionary* (Ref. 3), preferably using the first of any two or more acceptable versions.

(2) Grammar and syntax.

(3) Punctuation, according to the *U.S. Government Printing Office Style Manual* (Ref. 2).

(4) Usage, according to the usage level represented by *Modern American Usage* (Ref. 4).

(5) Fluency, including transitional words and phrases.

(6) Language parallelism. Examples of language parallelism are

  (a) Parallel use of symbols, words, or phrases in listings or enumerations.

  (b) Parallel wording of headings.

  (c) Parallel breakdown of the skeletal structure (e.g., making sure that if there is an (i) subordinate element, there is a parallel (ii) subordinate element).

  (d) Parallel use of grammatical constructions.

(7) Conciseness.

(8) Proper use of description, exposition, narrative, and argument and their effect on verb tense.

(9) Identification of inconsistent or erroneous terminology, to the extent possible.

(10) Definition of abbreviations, acronyms, and symbols.

(11) Completeness of fences in mathematical expressions.

(12) In viewgraphs, appropriateness of titles for visual presentation. The editor may generate viewgraph titles from publication figure captions.

Note that there is a fundamental difference between parallelism of language as discussed in item (6) above and the concepts of parallelism and subordination discussed under Substantive Edit. Parallelism of language is concerned primarily with the order and sequencing of symbols, words, and phrases, as distinct from the underlying ideas to which they relate. Imagine, for example, two subparagraphs under a main paragraph, with headings such as:

a. The advantages of gas turbines

b. Gas turbine disadvantages

The nonparallelism can be detected without the need to read and understand the subparagraphs themselves. In contrast, the parallelism and subordination discussed under Substantive Edit refer to ideas and concepts, as distinct from the words and phrases used to express them. And although substantive parallelism should be reflected appropriately in parallel language whenever the language can be thus used to enhance the underlying similarities or contrasts of ideas, the distinction between language parallelism and substantive parallelism should be kept clearly in mind when considering the edit level involved.

There is also a difference between language parallelism and mechanical style with reference to item 6(c) above. Whether subparagraphs are designated a, b, c;

i, ii, iii; or 1, 2, 3 is a matter of mechanical style; but the appearance of a subparagraph (a) with no subparagraph (b), or (i) with no (ii), is a matter of parallelism at the language level. And while the detection of such nonparallelism may be accomplished by performing a Language Edit, the repair may well require a Substantive Edit of the most probing kind.

It might seem from a cursory glance at the items above that a Language Edit consists in using well established, academically approved rules to manipulate a piece of prose into a standardized form called clear, objective technical writing, indistinguishable from all other instances of technical writing. But we feel that a Language Edit goes beyond the mere application of grammatical or syntactical rules. We think that an editor should never ignore the spirit of the language, should never sacrifice the essence of the communication to a convenient application of prefabricated rules, methods, procedures, or conditions. A Language Edit requires a sense of balance, of appropriateness. A heavy-handed editor, for instance, in an attempt to eliminate wordiness, may completely excise the rhetorical effectiveness of an author's prose; a timid editor, by allowing inappropriate or unbridled rhetoric, may allow the language to obscure the meaning. And although rhetoric and literary style are not specifically mentioned here as components of a Language Edit, they should, we think, be ever present in the minds of editors.

I. Substantive Edit

The Substantive Edit deals with the meaningful content of the publication. The edit includes, but is not limited to, coherence of the individual parts; for example, the scope of the publication should be accurately reflected in the Title, the Abstract, and the introductory section, and the information in all three areas should be consistent.

It is, of course, impossible to separate substantive thought processes from many of the operations that make up the other types of edit. Although other types of edit may thus incorporate substantive elements, there is also a wide range of editorial operations that are substantive *per se* and constitute a separate type of edit. These operations are discussed below.

1. Overall Publication

The editor ensures that the publication contains all of the report elements required for a complete presentation of the material, noting gaps, transpositions, and redundancies. When it appears necessary to revise the traditional order of elements, the editor advises the author on acceptable alternatives.

Specifically, the editor ensures that

(1) The Title accurately reflects the content of the publication and is concise within the need for qualification.

(2) The Abstract is concise, is of appropriate length, and presents sufficient information to enable the reader to determine the general content of the publication.

(3) The Introduction, the subsequent sections, and the Summary or Conclusions contain the material indicated by their headings.

(4) The Appendix material is presented in an acceptable format and is appropriate for inclusion in an appendix.

(5) The material is grouped and subdivided in a rational manner.

(6) Parallel ideas are given equal weight, and subordination of ideas is logical and appropriate to the content of the publication. (See the discussion of language parallelism under Language Edit.)

(7) The emphasis placed on various elements is appropriate to their significance, and the parallelism and subordination of ideas are appropriately reflected in the heading structure.

(8) Repetition and redundancy are eliminated wherever possible.

(9) Apparent discrepancies in the meaning expressed in different parts of the report are resolved. For example,

  (a) Statements made in different parts of the report do not contradict each other, or are not obviously inconsistent.

  (b) The content of a table or figure is not discernibly different from what is indicated by the discussion in text.

(10) Missing material—including factual information as well as required elements—is identified and brought to the author's attention.

(11) Apparently irrelevant or inappropriate material is identified and recommended for deletion to the author (e.g., a flowery statement of tribute to a contractor).

(12) The need for a Definition of Symbols or Definition of Abbreviations section is brought to the author's attention, and, if necessary, the editor assists the author in preparing such material.

(13) The need for any additional references in order to document material cited from other sources is brought to the author's attention.

(14) The need for obtaining permission to reproduce any copyrighted material that may be included is brought to the author's attention.

2. Tables

The editor is responsible for the correctness and clarity of tabular presentations and may advise the author on table design. The editor may convert text material to tabular form for greater reader comprehension. He reviews the tables submitted by the author and ensures that

(1) Table design is standard and correct (e.g., units of measurement appear in column heads rather than in the data fields).

(2) Information is complete (variables and units of measurement are clearly identified in the boxhead or stub column).

(3) Similar information within a table, and similar tables in series, are presented in parallel form.

(4) Table titles are adequate and appropriate; tables in series have parallel titles.

(5) The powers of 10 are expressed unambiguously.

(6) Table columns are grouped and ordered in rational sequence for maximum reader comprehension. Similarities and differences are emphasized.

(7) Tables are appropriately placed according to their relationship to the text.

3. Figures

The editor ensures that the message of the publication is enhanced by the arrangement and presentation of the figures. This function includes the following:

(1) All curves, data points, ordinates, and abscissas are fully identified in a manner that is appropriate to the content of the report.

(2) Excessive detail is deleted from figures. If the deleted material is significant, it may be incorporated elsewhere in the report.

(3) Scales are added to photographs where required.

(4) The powers of 10 are expressed unambiguously.

(5) Where double ordinate and abscissa scales or other double identification may be required for the use of SI and English units, the presentation is simple, clear, and consistent.

(6) Figures in series or comparable parts of multi-part figures are arranged consistently and presented in a manner most appropriate to the significance of the data.

4. Slides and Viewgraphs

The editor analyzes artwork submitted for slides and viewgraphs to ensure that

(1) The material appropriately represents the subject matter. The editor may suggest to the author other ways of presenting his material.

(2) The material will be readable when it is presented on a screen. The editor may suggest deleting copy, rearranging the material, or separating the material into several slides or viewgraphs.

References

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3. *Webster's Third New International Dictionary of the English Language, Unabridged*, G. & C. Merriam Company, Springfield, Mass., 1976.

4. Follett, W., *Modern American Usage*, Hill & Wang, Inc., New York, N.Y., 1966.

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About The Authors

Robert Van Buren obtained a bachelor's degree in English from Ohio State University and began his professional career as a technical writer for Gilfillan Co. in Los Angeles. There he wrote technical manuals for both military and commercial applications. He subsequently became a technical writer/technical editor for various aerospace firms and in 1964 joined the Publications Section of the Jet Propulsion Laboratory. One of his early tasks was to publish the proceedings of the first conference on the Solar Wind, editing the papers of scientists such as Carl Sagan and Norman Ness. In 1966, he became group supervisor of the Laboratory's external publications group. When computers became available, he created and developed a Unit Cost Estimating System for estimating the cost of publications, and an Inventory System which is still in use today. In 1980 he and Mary Fran Buehler published *The Levels of Edit,* an attempt to bring some coherence to the editing process at the Laboratory. In 1985 he became manager of the Laboratory's Documentation Section, and since that time has been working to bring automation to the production of the Laboratory's technical documentation.

Mary Fran Buehler, who began her publications career as a night-beat police reporter for the City News Bureau in Chicago, has spent her adult life writing, editing, and managing publications—chiefly for the State of Illinois, the U.S. Army, and the Jet Propulsion Laboratory (JPL) California Institute of Technology, Pasadena, where she is now a documentation staff specialist. She holds a master's degree in journalism from Northwestern University and a Ph.D. degree in communication, with emphasis in rhetoric, from the University of Southern California. She has taught technical writing at JPL and at the California State University, Los Angeles, and an advanced course in technical editing at UCLA. She has written many papers and articles on technical communication, including "A Definition of Technical Writing Based on Some Semiotics Concepts of C.S. Peirce," which she presented at a recent conference of the Modern Language Association.

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