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Standard

Scientific and Technical Documents Standard



The INL is a U.S. Department of Energy National Laboratory operated by Battelle Energy Alliance.

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1. INTRODUCTION

This standard describes the required format^a for scientific and technical documents at Idaho National Laboratory (INL). It contributes to INL's reputation—as well as that of its employees—by assisting authors, editors, and text processors in preparing clear and logical research and development information in a consistent and recognizable style that reflects best practices in the publications industry. This standard should be followed unless preceded by a requesting organization's standard, which may be the case with conference papers, journal articles, proposals, documents produced by some specific INL programs, and work-for-other's contracts such as Cooperative Research and Development Agreements.

Style conventions included in this standard are based on widely accepted sources such as *The Chicago Manual of Style* (for traditional and digital print production); *American National Standards Institute's Scientific and Technical Reports—Elements, Organization, and Design* (informs INL's templates); *Government Printing Office Style Manual* (gives insight into the expectations of the publisher for reports that will receive print and digital publication through official government channels); and *Associated Press Stylebook and Briefing on Media Law* (for press releases and other documents that are likely to be quoted in the popular press). For assistance in producing INL scientific and technical documents contact a facility-specific writer/editor listed in Table 1.

Site	Advanced Test Reactor (ATR) Complex Document Management	(208) 533-4413 (208) 533-4027
	Materials and Fuels Complex (MFC), Documentation Support	(208) 533-7941
	Specific Manufacturing Capability (SMC) Writing/Editing Services	(208) 526-8938
REC	Knowledge Management	(208) 526-9047 or https://inl.service-now.com/ess/publication or https://im.inl.gov/TechWrite/SitePages/Home. aspx
	NS&T	(208) 526-2715
	EES&T	(208) 526-1533

Table 1. Writer/editor contact information.

a. *Format.* The material form or layout of a publication.

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2. SCIENTIFIC AND TECHNICAL DOCUMENTS

In the process of conducting research and development (R&D), scientists, engineers, and support personnel prepare varied forms of scientific and technical documents, including conference papers, reports, proposals, journal articles, and miscellaneous communication materials such as brochures, plans, presentations, white papers, and information produced for publication on company websites. This standard presents specific report elements that will likely be included in most, if not all, of these sources.

2.1 Reports

The two types of technical reports prepared by INL employees are external and internal. These reports differ in format, content, and distribution as described below. For assistance in preparing INL reports contact Knowledge Management (<u>https://inl.service-now.com/ess/publication</u> or <u>https://im.inl.gov/TechWrite/SitePages/Home.aspx</u>).</u>

2.1.1 External Reports

External reports represent INL to the scientific and technical community and are distributed to individuals or organizations outside of INL after being approved for external release in accordance with <u>LWP-1401</u>, "Preparing and Releasing Scientific and Technical Information Products," thus the label "external." External reports cover a variety of topics and accomplish many purposes. The audience identified by the customer or a specific agency's distribution code can be broad or limited (domestic and foreign industries, utilities, libraries, and government agencies, or DOE laboratories, contractors, and others immediately involved in the project, program, or report). Use <u>TEM-150-2</u> to format external reports for consistency with INL standards.

2.1.2 Internal Reports

Internal reports are distributed to internal INL audiences based on content and are usually confined to immediate INL organizations or projects (can include DOE-Idaho Operations Office [DOE-ID] personnel), thus, the label "internal." Internal reports include operating reports, preliminary calculations, and study results. If an existing internal report needs to be sent outside INL, it must be approved for external release in accordance with LWP-1401. Use TEM-150-2 to format internal reports for consistency with INL standards.

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2.2 Proposals

Proposals are generally prepared and submitted to funding agencies by INL scientists and engineers. To be successful, proposals should, as a minimum, comply with the appropriate request for proposal (RFP) posted by the funding agency. Funding agencies usually require certain format and style elements such as font type and size, page margins, and expected content. Although some elements in this standard apply to most proposals, especially when the RFP has no specific format and style requirements, others will be superseded by the RFP.

Additional INL guidance on preparing and submitting proposals (processes, standards, and templates) is available from the Funding Opportunities webpage: <u>https://partnershipsandagreements.inl.gov/sites/nstproposals/SitePages/Home.aspx</u>.

2.3 Conference Papers and Journal Articles

Conference papers and journal articles represent INL, DOE, and DOE-ID to the world. Although style elements presented in this standard may apply, the format dictated by the society or journal to which the paper or article is being submitted will take precedence. If none are specified, prepare the paper in single-column, double-space format. The title page would include:

- Title of Paper
- Author(s)
- Idaho National Laboratory (and other authors' affiliations if not INL)
- Idaho Falls, Idaho 83415.

Credit should be given to the work sponsor in either a footnote to the title on the first page of the document (see bullet *Credit line or prepared for statement* and the *Footnotes* section) or in the Acknowledgment section (see *Acknowledgment* section). For additional assistance with format and style when preparing journal articles and conference papers, contact Knowledge Management (<u>https://inl.service-now.com/ess/publication</u> or <u>https://im.inl.gov/TechWrite/SitePages/Home.aspx</u>).</u>

2.4 Websites

INL graphic design artists, writers/editors, and programmers are available to help design and produce a website. They can structure information, create the graphics and overall design, and assemble all of the elements into a usable and aesthetically appealing site. This standard does not provide content and format details for creating websites, but many of the colloquialisms presented in Appendix A do apply. To request help with a SharePoint site, visit <u>ServiceNow</u>, or contact the SharePoint Lead (208) 526-1850.

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2.5 Miscellaneous Documents

Miscellaneous documents refer to written and printed information prepared at INL for internal or external distribution that is not governed by an established guide and/or template. Miscellaneous documents may include presentations, brochures, white papers, and administrative documents that support marketing, design, research and development, etc. Although not directly subject to the format and style elements presented in this standard, many of the structural and style conventionalisms and best practices presented herein can enhance these types of documents. See the Image Gallery on Nucleus for INL's preferred branding (https://nucleus.inl.gov/imagegallery/SitePages/Home.aspx).

2.6 Presentations

Most presentations prepared at INL are developed in Microsoft Office PowerPoint using the approved INL template. INL editors and graphic design artists are available to assist in preparing presentations using the appropriate software and INL markings. Editors and artists will prepare drafts and work with authors until a satisfactory product is completed. INL-approved presentation templates can be downloaded at <u>https://nucleus.inl.gov/imagegallery/SitePages/Home.aspx</u>.

2.7 Brochures and Factsheets

There are significant differences in the standards and necessary approvals outlined here and those followed by INL's Communications department. Brochures (small books, usually saddle stitched) and factsheets (generally one to four pages with data) are listed in the public affairs category. Researchers should work with their Communications liaison to develop and obtain necessary DOE approvals.

A brochure is a pamphlet, booklet, folder, factsheet, or other publication that is not a technical report, conference paper, journal article, script, poster, or periodical. Brochures rarely have specific distributions and are often designed for public relations or marketing purposes. Most often they consist of a single or double page in varying sizes, with text and graphics printed front and back in various configurations to best achieve the desired effect (https://factsheets.inl.gov/SitePages/Home.aspx).

For a professional appearance, most brochures and factsheets should be laid out by an INL graphic design artist using the appropriate software, fonts, and INL markings. Authors should plan to spend a sufficient amount of time with the artist to communicate their objective and the desired layout for their information. Artists will prepare drafts and work with authors until a satisfactory product is completed. Authors can enlist the services of a graphic artist by contacting Knowledge Management (<u>https://inl.service-now.com/ess/publication</u> or <u>https://im.inl.gov/TechWrite/SitePages/Home.aspx</u>).

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3. CONTROLLED UNCLASSIFIED INFORMATION LABELS

Special controlled unclassified information (CUI) labels may be required on the cover page and in headers and footers of some scientific and technical documents. For specific directions regarding these labels and special handling instructions for CUI documents, see INL <u>LWP-11202</u>, "Controlled Unclassified Information Program," and <u>GDE-11100</u>, "Controlled Unclassified Information (CUI) Marking Guide."

4. SCIENTIFIC AND TECHNICAL DOCUMENT ELEMENTS

The main elements of scientific and technical documents are listed in Table 2 and described in the subsections that follow. Some elements should be included while others are optional and may be included as needed to accomplish the purpose of the document.

Report Element	Location (page no.)	External	Internal	DOE-ID
Page layout	All pages	Include	Include	Include
Cover	Top of document	Include	Include	Include
Disclaimer	Back of cover	Include	Optional	Not used
Title page	Page i (not showing)	Include	Include	Include
Signature page	iii (not showing)	Optional	Optional	Optional
Abstract	iii or v	Include	Optional	Include
Summary	Next odd page	Optional	Optional	Optional
Foreword	Next odd page	Optional	Optional	Optional
Acknowledgments	Next odd page	Optional	Optional	Optional
Contents	Next odd page	Include	Include	Include
Figure and table lists	Beneath contents	Optional	Optional	Optional
Acronyms	Next odd page	Optional	Optional	Optional
Body of document	Arabic page 1	Include	Include	Include
Bibliography	Next odd page	Optional	Optional	Optional
Index	Next odd page	Optional	Optional	Optional
Appendices	Next odd page	Optional	Optional	Optional
Attachments	Next odd page	Optional	Optional	Optional

Table 2. Technical report elements.

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4.1 Electronic Template

Electronic templates accessed through EDMS have been created in Microsoft Word for use in preparing INL technical reports. The use of templates is an easy way to add polish, save document development time, and increase productivity. Each template contains the appropriate formatting and component settings built into assignable styles (e.g., appropriate line spacing, margins, page numbering, headers and footers, and content placeholders for the cover page, title page, signature page if used, contents, abstract, summary, forward, acknowledgments, acronyms, and the body text for the type of document selected). See Table 3 for the proper template.

Table 3. Report template list.

Internal and External Reports	<u>TEM-150-2</u>
DOE Reports	<u>TEM-150-3</u>

4.2 Margins

Except for the cover page, technical documents generally have a 1-in. margin on the left, right, top, and bottom of all pages in both portrait and landscape orientations. This provides a 6.5×9 -in. working area for text, figures, and tables, even when a two-column format is used.

4.3 Cover Pages and Labels

Cover pages have been designed and approved by DOE and INL management for INL scientific and technical reports, which provide a consistent, professional image and introduce the main topic and authors (see Figure 1). Some deviation to the cover may be allowed when approved in advance per <u>LWP-1401</u> and when special labeling is required by <u>LWP-11202</u>. Also, INL customers who have reports prepared as part of work-for-others contracts may require a unique cover that reflects their own house style. In these cases, the contractor's cover may be placed under the INL cover; following INL release, the customer is free to remove the INL cover for their internal distribution.

INL and DOE-ID approved report covers normally have five components:

- *Distinguishing background with the appropriate logo*. INL print shops stock paper copies of each cover with the background included for use when printing these documents.
- *Document identification numbers*. Report numbers are obtained from the Laboratory Review System (LRS) database as described in <u>LWP-1401</u>. The applicable portion of the number will need to be added on the cover where indicated.

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- *Report title*. A well-written title is required for abstracting, cataloging, indexing, and referencing the report. Subtitles may be used if the report is one of a series or supplements a previously published report.
- *Authors*. The full name (first name, middle initial, last name) of all authors should be included.
- *Issue date*. The date of issue is normally included on the cover using the month and year (June 2018; preferred) or the month, day, and year (June 21, 2018; optional).



Figure 1. Samples of INL report cover (left) and DOE-ID report cover (right).

4.4 Disclaimers

INL scientific and technical documents prepared normally include a legal disclaimer per <u>LWP-1401</u>. However, putting the disclaimer on environmental documents can be a sensitive issue, primarily because of the highly visible cleanup work INL performs for DOE. Technical documents that may not carry a legal disclaimer include, but are not limited to, environmental assessments, environmental impact statements, waste management and environmental restoration, and policy and regulation communication.

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4.4.1 Content

The legal disclaimers approved for use on INL and U.S. Nuclear Regulatory Commission (NRC) technical reports are shown in Figures 1 and 2, respectively. The disclaimer for NRC reports is called a Notice. These can be copied from this document or obtained from Knowledge Management (<u>https://inl.service-now.com/ess/publication</u> or <u>https://im.inl.gov/TechWrite/SitePages/Home.aspx</u>). Should requesters want printing to add the disclaimer, written instructions requesting it be added should be included on the printing request form.

DISCLAIMER

This information was prepared as an account of work sponsored by an agency of the U.S. Government. Neither the U.S. Government nor any agency thereof, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness, of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. References herein to any specific commercial product, process, or service by trade name, trade mark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the U.S. Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the U.S. Government or any agency thereof.

Figure 2. DOE disclaimer.

NOTICE

This information was prepared as an account of work sponsored by an agency of the U.S. Government. Neither the U.S. Government nor any agency thereof, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for any third party's use, or the results of such use, of any information, apparatus, product, or process disclosed herein, or represents that its use by such a third party would not infringe on privately owned rights. The views expressed herein are not necessarily those of the U.S. Nuclear Regulatory Commission.

Figure 3. NRC disclaimer.

4.5 Title Page

4.5.1 Format and Style

Title page components are all centered on the page underneath each other as shown in Figure 4. The title page does not have a page number on it. Placeholders with built-in styles containing the appropriate

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formatting for the title page are included in the electronic template provided in <u>TEM-150-2</u>.

- *Document identification number*. This number is used for archiving and tracking purposes and is obtained from the INL Laboratory Review System.
- *Title*. The title tells the reader what the document is about.
- *Author(s)*. This field should list all author(s) using the full name (first name or initial, middle initial or name, last name), even when not included on the cover page. If desired, the institutional affiliation, address, and organization can also be included.
- *Date published*. Consists of the month and year (May 2007) or the exact release date (May 1, 2007).
- *Prepared by Statement.* This entry consists of the name, physical address, and Web address of the national laboratory and, if desired, the name of the originating organization. When the originating organization is included, use the title of the organization assigned direct responsibility for the work project that prompts the documentation, whether a branch, directorate, department, or a combination of these entities. This is generally the managing organization responsible for the project's budget, even though it may have enlisted the help of other INL branches, directorates, or departments in completing the project.
- *Credit line or prepared for statement.* The credit line contains the DOE or NRC statement acknowledging the source of funding for the work being reported in accordance with <u>LWP-1401</u>. It includes the name of the organization the report was prepared for and the contract number or job code under which the preparer performed the work. For example, Battelle Energy Alliance, LLC (BEA) is contracted by DOE to manage and operate INL. A report prepared by an INL organization for a DOE Office will carry the BEA contract number (DE-AC07-05ID14517) in this entry. A report prepared by an INL organization for the Department of Homeland Security would carry a different name and number.

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	Prepared for the U.S. Department of Energy Under ODE labor positions Office Contract DE-AC07-451D14617	u s poe	Prepared for the Department of Energy Islabs Operations Office		

Figure 4. Sample title pages for INL reports (left) and DOE-ID (right).

4.6 Signature Page

Although some organizations commonly include a signature page in their technical reports, it should only be included when required by the customer. When using a template, the signature page may be deleted if it is not needed. The purpose of the signature page is to show approval for release and serve as an approval record for the preparing organization. Figure 5 shows a common signature page approved for use in all INL scientific and technical documents.

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Originating Organization (optional)		
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Мо	nth 200X	
Approved by:		
Name Title (optional)	Date	
Name Title (optional)	Date	
Name Title (optional) Name Title (optional)	Date	

Figure 5. Sample signature page for INL reports.

4.7 Abstract

An abstract is a concise statement of a project's purpose, methods, results, conclusions, and sometimes, recommendations. It is required for research reports, technical conference papers, and technical journal articles because it is the only information available, along with the document title, to individuals conducting literature searches in the subject area.

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4.7.1 Abstract Content

The abstract should be 200 words or less for reports, usually in one paragraph. DOE's Office of Scientific and Technical Information (OSTI) limits abstracts to 1,000 characters, including spaces (about 200 words). Abstracts in journals, conference papers, and proposals should stay within the limits established by the publication.

Since researchers generally read abstracts first, an abstract is only valuable to the degree that it reveals information relevant to the researcher's interest. Before writing an abstract, it is good to review several well-edited abstracts pertaining to the subject. For journal articles, read the publication's guidelines for authors and the abstracts printed in the publication itself, if possible. It is often a good idea to write the abstract last, after the entire report is finished. When completed, check it against the report to make sure they agree. When writing abstracts:

- Assume the reader has a reasonable level of technical knowledge. However, technical depth and use of technical terms should be appropriate to the intended audience.
- Be terse.
- Mention special equipment or processes (such as gas chromatography or energy dispersive spectroscopy).
- Use such words as brief, theoretical, comprehensive, preliminary, or exhaustive to describe the level of effort or research.
- Include key words likely to be used in Internet searches.
- Do not put references, tables, figures, equations, footnotes, or other information in the abstract that is not found in the report. Do not refer to a specific section, table, or illustration contained in the report.
- Do not compare the reported work with what is already known or has been done by others. The abstract should stand alone.
- Do not confuse an abstract with a summary, which condenses every part of the report, including the introduction and background.

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4.8 Summary

A summary (sometimes referred to as Executive Summary) is a digest of the main points presented in a document and in the same sequence as the body of the work. Summaries are generally read by executives, managers, and fellow researchers who need a brief, overall synopsis of the project. Although optional for INL technical reports, summaries are especially helpful in lengthy, highly technical documents.

Write the summary after the report is completed, then check what is written against the report to make certain they agree. When writing summaries follow these guidelines:

- Read the publication guidelines for authors, which may include length limits on summaries.
- Use clear, uncomplicated language. The summary should not be as technical as the overall report because executives and others may not be technically knowledgeable about the subject. Depending on the audience, nontechnical language may be desired.
- Briefly state what the project was, why it was undertaken, why the report is being written, who performed the work (e.g., INL, DOE), and when and where it was completed. This information, of course, should also be included in the main body of the report.
- State the report's highlights.
- State the conclusions (not test results) that have been inferred from the data and how they may be used. If there are recommendations, briefly state them.
- Do not include references.
- Do not include information in the summary that is not also in the report.

4.9 Acknowledgment

An acknowledgment credits the source of unreferenced material and expresses appreciation to those who assisted in preparing the document. An acknowledgment section is optional for all scientific and technical documents and is rarely used in internal reports.

When included, the acknowledgment section follows the abstract, summary, and foreword, except in a NUREG/CR (see organization under NRC External Report in Appendix A). Single-space the acknowledgment information in a 5-in.-wide

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column. When less than one full page, optically center the text. A placeholder with built-in styles containing the appropriate formatting for the acknowledgment page is included in the electronic template.

4.10 Contents

Most scientific and technical documents are long enough that an outline of their contents is useful to readers, and a contents section should generally be included.

The correct title of this section is "CONTENTS," not "TABLE OF CONTENTS." The contents section normally contains all front matter headings (e.g., Abstract, Summary, Acknowledgements, Acronyms); first-, second-, and third-order headings; appendices and titles, when included; and attachments and titles, when included.

4.10.1 Figure and Table Lists

When necessary, figure and table captions should be listed at the end of the contents section as shown in Figure 7 above. However, lists of figures and tables are required only in a NUREG/CR and are usually unnecessary. When included, figure and table lists, in that order, are considered part of the contents and do not start on separate pages. See organization under NRC external report in Appendix A for information on the placement of front matter in a NUREG/CR.

CONTENTS	
ABSTRACT	
ACRONYMS	v
1 HEADING 1 1.1 Heading 2 1.1.1 Heading 3	
Appendix A—Title	1
Firms 1 Conting	FIGURES
Figure 1. Caption	
Table 1. Caption	TABLES 2

Figure 6. Sample contents page.

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4.11 Acronyms List

If a report contains numerous acronyms and initialisms, they can be listed alphabetically in a section labeled "Acronyms." If included, the acronyms section appears on the next odd page immediately following the contents and figure and table lists. A similar list can be included after an appendix title page, if that appendix contains numerous acronyms and initialisms that need to be defined.

The acronym must appear more than three times in the body of the document. Abbreviations are normally not included in acronym lists because it is assumed that readers are familiar with their meaning. If the audience may be unfamiliar with their meaning, consider defining them in parentheses after the first callout: wt% (weight percent).

4.11.1 Other Lists

Other special lists may be included within the front matter of a report if considered valuable to the reader. Consider adding a list of symbols to avoid repetitious definition of symbols in the body of a report containing many equations. A glossary of key terms may be included, when used in a manner that is out of the ordinary or when their definition would be helpful for the uninitiated but intrusive if placed within the body of the report. Glossary terms should be formatted similar to the acronyms list.

4.12 Body of Document

The body of most technical documents consists of sections that contain headings, body text, lists, figures (graphic illustrations), tables, and references in one form or another. These sections may describe work that has been done, work that is being proposed, plans to accomplish specific tasks, or other information relative to INL projects, organizations, and activities. The sequence of sections depends on the document's purpose. Possible sequences are: (a) introduction, discussion, conclusion; (b) introduction, methods, results, recommendations; and (c) introduction, experiment, evaluation, summary. The information may be highly technical and complex or more simple and generic in nature. In any case, the information needs to be presented in a manner that meets the needs of intended readers. The audience is often scientists, technicians, or engineers within the R&D community, but it may include others within government agencies and in private industry or stakeholders.

The preferred format and style for body text described in this section applies to all types of INL technical documents unless other guidance preferred by a customer takes precedence, such as in emergency procedures or correspondence. The electronic template provided in <u>TEM-150-2</u> contains styles that have the appropriate formatting for these components.

4.12.1 Lists

Lists can be displayed (broken out vertically) or run-in (presented within the text of a paragraph). Displayed lists are used to give prominence, emphasize order or sequence, summarize, or visually simplify listings (items in a list). Run-in lists are used to downplay prominence, order, and summarization and to conserve space. Information that requires two or more columns or is mostly numerals or other symbols should be included in a table, instead of a list. Individual lists should have consistent format, phrase, and clause style according to the following guidelines:

- Displayed lists may begin with bullets, numbers, letters, or no figures. In any case:
 - Generally, start list entries with bullets (•), or, if sequence, order, or priority is important, with numbers (1., 2., 3.).
 However, there may be times when no bullet or number is appropriate.
 - Indent and start subentries with a hyphen (-) in bulleted lists; or a., b., c. in numbered lists.
 - Capitalize the first word of each entry and proper nouns within each entry.
 - Do not place a comma or semicolon after an entry, but place a period after the last entry, unless an entry contains two or more sentences, then end each entry with a period.
 - Make entries parallel; for example, if one entry is a sentence, make all of them sentences. If you start the first entry with a verb, start the remaining entries with verbs as well.
 - Indent after each bullet or number so that the text of each listed item aligns.
 - If a list item has more than one paragraph, apply the list Continue style included in <u>TEM-150-2</u> to align the text.
- For long run-in lists, especially when listed items are wordy: (a) start entries with letters or numbers enclosed in parentheses: (a), (b), (c) or (1), (2), (3); (b) do not capitalize the first word of an entry; (c) set off entries with punctuation marks; and (d) place a conjunction before the last entry.

4.12.2 Figures

Figures include charts, graphs, line drawings, and photographs. They should be clear, uncluttered, and have a descriptive caption.

Center figures horizontally between paragraphs of text or embed them within the text as space permits after their first mention or callout in the text. Generally, place full-page figures on the first page following the first call out of the figure. Numerous figures may be grouped together at the end of a section or document.

Avoid turned (landscape format) figures and foldouts, because they are generally awkward and disruptive to readers. The Graphic Arts file number or photograph number used for tracking should appear in the bottom right corner of the figure.

4.12.2.1 Figure Captions and Numbers

Figure captions should simply and briefly describe what the figure is (e.g., "Cutaway illustration of the ATR core."). Figures that are self-explanatory are best, but do not assume that readers will interpret what you want them to see in the figure. If the message of a figure needs additional explanation, include it in the body text near the citation.

NOTE: Copyright infringements carry significant economic risk. Penalties might include injunctions; impoundment and disposition of infringing copies; actual or statutory damages (ranging from \$100 to \$50,000, depending on the potential for profits, the willfulness of the infringement, etc.); lost profits; attorney fees; and possible criminal sanctions. For more information on copyrights see <u>LWP-1401</u>.

> Images, photographs, and figures that are not the original creation of the authors or graphic artists employed by INL are potentially subject to copyright laws. When images from sources outside INL are used within a document, the caption should include an acknowledgement of the source, as "From [source]." If permission has been obtained from the original creators of the image, the phrase "used with permission" should be added to the source acknowledgement.

The preferred ways to cite figures in the text are: as shown in Figure 4, Figure 4 shows, or (see Figure 4). Always spell out figure (e.g., Figure 2, not Fig. 2).

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Figures should be numbered sequentially throughout a document in order of appearance. If necessary, number figures in appendices using the appendix letter followed by a hyphen and the figure number (e.g., Figure A-1).

Figure captions are placed <u>below</u> the figure and are preferably aligned with the left and right edges of the figure. The captions are sentences that use normal sentence case (proper nouns are capitalized) and end with a period as follows:

Figure 1. Diagram of low-level waste classifications, including greater-than-Class C low-level waste as depicted in graph.

4.12.3 Tables

Tables are arrangements of data into columns and rows. They generally differ from lists by having more than one column and containing primarily numbers, text, or other symbols. Tables should be well-organized and neat.

The correct form for citing tables in text is to spell out table (e.g., Table 2, not T. 2 or Tbl. 2).

Number tables sequentially throughout a document in order of appearance. The same rule applies to tables in an appendix (e.g., Table A-1).

4.12.3.1 Table Captions

The table caption should be written in sentence style and briefly explain the table. Capitalize the initial word and any proper nouns in the title and end it with a period.

Table captions should be placed <u>above</u> the table and aligned to the left margin or left edge of the table with wrapped lines of text also aligned flush left as follows:

Table 1. Comparison of low-level waste classifications, including greater-than-Class C low-level waste as well as Class A and Class B low-level wastes.

To continue a table, do not repeat the whole title. Instead, use this form:

Table 1. (continued). *Note the lowercase c*.

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4.12.3.2 Formatting Tables

Apply the following guidelines when formatting tables for INL technical documents:

- Table lines. Format tables so they make the most sense to the reader. At a minimum, separate the column headings of the table from the table title with a solid line extending the width of the table. Column headings that straddle other column headings should also be separated with a 0.5 point in density line. Lines may be placed around other table cells and cells may be shaded or colored to add clarity, but they should be consistent throughout the document.
- Footnotes in tables. Cite footnotes in tables with superscripted lowercase letters (a, b, etc.), especially if numbered endnotes are used. Place footnotes in a table row at the bottom of the table and make them two points smaller than the body text of the table (but not smaller than 7-point text). Footnotes will start over in each new table. Make the footnote line in the table approximately 1-1/2 to 2-in. long, but use it only when the table has no line under the above row.
- Acronyms in tables. Acronyms in tables that have been previously defined in body text do not need to be redefined in the table. Those that are called out in a table first and used later in body text should be defined at first call out in both places. Acronyms that cannot be spelled out and defined within the table cells (e.g., too small) should be defined in footnotes to that table. Acronyms exclusive to a table (not used elsewhere in the document) do not need to be included in the Acronym list.
- Empty table cells. Center an emdash (—), indicating no information is available, or an NA, indicating not applicable, in empty table cells as appropriate.

Form 412.09 (Rev. 10)

4.13 Footnotes

A footnote is a means of conveying information that may be of interest but is outside the main line of thought. Placing information in a footnote gives the reader the option of reading or ignoring it. Lengthy, discursive footnotes should be reduced or integrated into the text. The types of information to include in footnotes are important undocumented information obtained from telephone calls, private letters, memoranda, or unpublished material. Footnotes often contain less detail than entries in a references section.

INL style is to cite footnotes in text using lowercase superscript letters consecutively throughout the document starting with "a," or, if necessary, by section. Footnotes in appendices restart with the letter "a" for each appendix. In text, insert the superscripted footnote letter after periods and commas, but before colons and semicolons. This can be done manually, or automatically using the Microsoft Word "Footnote and Endnote" feature located through the References tab menu (the Microsoft Word footnote style is acceptable formatting for scientific and technical documents).

Type the footnote in single-spacing at the bottom of the page below a 1-1/2 to 2in.-long horizontal left-justified line (automatically inserted with the Microsoft Word feature) (see example in the footer below). Start footnotes flush left with a regular-size letter (not a superscript letter) followed by a period and one space. When typeset, footnotes are two points smaller than the body text, and the 1-1/2 to 2-in. line is at least 3/8-in. below the text, if possible (see Footnote b).

To reference a previous footnote, type see Footnote X in parentheses (e.g., see Footnote e) at the point of reference. The Microsoft Word cross-referencing feature may be used to insert the letter.

4.14 References

A reference acknowledges a source of information included in the report, enables readers to find additional information on a subject, and provides facts needed to locate that information. In publishing, the term *reference* has three meanings: (1) a note or mark referring the reader to another passage or source; (2) the passage or source referred to; and (3) an entry of facts needed to find the passage or source. Citing a source gives authoritative backing to your writing, acknowledges those who published the original work, makes the reader aware of underlying or related material, and provides information to aid the reader in the search.

b. Private communication with Robert J. Straight, Reynolds Electrical and Engineering Co. (REECo), Las Vegas, Nevada, May 19, 1996.

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Referencing irretrievable information, such as classified reports, is discouraged. However, if such information is the only source available, it may be referenced by using words that are not classified, such as the title of the report or the report number. A derivative classifier can determine whether the title of a report is classified. The report number is generally not classified information. If a classified entry is included, add a note at the end of the entry in the references section to distinguish it as a classified report, such as, "This is a classified report that is unavailable to the public."

Since the purpose of providing an entry in the reference section is to direct the reader to a certain publication, be sure to include the information necessary to find that publication. This is generally the author, title, organization(s), and document number(s) of the work as published. See *CMOS* for specific formatting of references, and Appendix B for a quick reference guide of references for various kinds of documents in both author/date and numbered forms.

4.14.1 Citing Author-Date References in Text

One option used at INL to reference source materials in technical documents is the author-date or parenthetical method, which places the name of the author(s) and the publication year in parentheses (Jones 2001) after the callout. The key to successfully using this method is including the facts in the citation that are necessary to find the reference. The following guidelines should be applied when citing author-date references:

- Cite sources by the author's last name and the year of publication, with no punctuation: (Gagioli 1999) or Gagioli (1999) maintained that.... When a work has more than one author, include the last name of each author—up to three authors. The form for two authors is (Gagioli and Malde 1999), for three authors (Gagioli, Malde, and Smith 1999), and for four or more authors (Gagioli et al. 1999).
- When citing sources without a person named as the author, use this form: INL 2000; DOE-ID 2001; BEA 1997; DOE O 441.1-1, 1999; SAR-100, 2000; Public Law 99-339, 1986; 33 USC 1251, 1994.
- To reference more than one publication by the same author or organization in the same year, cite the first publication as Smith 1999a, DOE-ID 1997a; and the second as Smith 1999b, DOE-ID 1997b.
- To reference two or more publications by the same author in different years in a single reference, use: (Monroe 1998, 1999).

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- Use semicolons to separate two or more references grouped together as (Clampton 1988; Martin and Ford 1985).
- When citing sources from former contractors, use the contractor acronym as the author: (BEA 1995).

4.14.2 Citing Numbered References in Text

Some authors prefer to use the number identification method for citing references in technical documents. This option uses raised arabic numerals in sequence, such as Jones.3 The decision to use this method should be based on production needs, convention relative to the subject matter, and customer requirements. The following guidelines should be applied when citing numbered references, as follows:

- Place a superscript number following the information to be referenced: "...sampling performed in FY-95."¹ Number citations consecutively throughout the document. Place a superscript reference after a comma and period, but before a colon and semicolon.
- When two or more references are cited together, separate them with a comma, but without a space: 6,7. When three or more references in sequence are cited together, separate the first and last numbers with an endash:6–9 In text, do not place parentheses or brackets around superscripts.
- Avoid placing a reference number immediately after a number or mathematical symbol, because the reference number might be mistaken for an exponent. Instead, include a parenthetical note after the number or mathematical symbol: (Reference 2). This parenthetical note may also be used to cite repeated references.

Numbered citations can be inserted and superscripted manually or automatically inserted using the Microsoft Word Footnote and Endnote tool. Using the automatic tool requires a good working knowledge of the software's complexities and possible complications with section breaks and so forth, especially when a single reference is called out multiple times in a document. For assistance with this task, contact Knowledge Management (<u>https://inl.service-now.com/ess/publication</u> or <u>https://im.inl.gov/TechWrite/SitePages/Home.aspx</u>).

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4.15 Appendices

Supplementary information may be added to a document in appendices after the last section (generally references) of a document.

An appendix may include:

- Information that is a necessary part of the document but would detract from the orderly presentation of material in the main body such as extended tables and lists
- Information that is valuable to a specialist or subject matter expert but not to the general reader, such as complicated tabular material and highly technical explanations.

To keep the size of documents manageable and save Document Control from having to duplicate the control process for information already being controlled, appendices should not contain previously published documents that can be obtained by the reader through other means. Preferably, use a citation and complete reference to help the reader locate the information. If necessary (special request by sponsor), include an appendix flysheet with the reference under the title (e.g., EDF-3217, Rev. 0; or INL/EXT-07-12011) so it shows up on the automatically generated Contents. This can be followed by a document contents and brief summary of the document that highlights key points applicable to the reader.

4.16 Attachments

An attachment is generally a supplementary document that is attached to a primary document, usually referenced in the document. The use of attachments in INL documents is highly discouraged (see the previous Appendices section above).

If included, attachments follow appendices and are introduced by an appendixtype flysheet but retain the attachment's original formatting and pagination. Attachments electronically inserted into an electronic copy of the Microsoft Word document will likely take on the Word styles, causing formatting changes that may be undesirable. Using the PDF format is generally a better way to combine two documents.

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Appendix A

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Abbreviations. An abbreviation is a shortened name, word, or phrase: FL, Fla., bldg. abbr., N.Y., rpm, auto, USMC, lb. In handling abbreviations, follow these guidelines:

Abbreviations are normally not included in Acronym lists because it is assumed that readers are familiar with their meaning. If the audience may be unfamiliar with them, consider defining them in parentheses after the first callout: 25 IWC (inches water column). In text, generally abbreviate units of measure with numbers (e.g., 4 L, 12 g, 1,500 V, 4 gal, 7 kg) except time (38 hours, 7 years, 9 minutes). If a number is not included with a unit of measure, spell out the unit: a foot of overburden not a ft of overburden. Most units of measure do not require a callout. Do not split measurements: 3 ft should never be divided so that 3 ends one line and ft begins the next one. To keep the figure and unit of measure on the same line, enter a hard space between them.

With the exception of in. for inch(es), do not place a period at the end of abbreviated units of measure (lb, ft, oz), and do not use "s" plurals with these units: 78 kg, not 78 kgs.

Avoid unnecessary repetition of units of measure: between 20 and 50°C, not between 20°C and 50°C.

OTHER ABBREVIATIONS: In general, use periods with abbreviations that are not acronyms, initialisms, or units of measure: Inc. vs., etc. Use "s" plurals at the end of abbreviations that are not units of measure: bldgs., stds. Unless showing possession, do not use apostrophes in abbreviations.

Chemical symbols (i.e., U for uranium) are abbreviated forms for longer terms, not acronyms, and should be considered familiar to most scientific audiences, requiring no callout. They should not appear in acronym lists. INL uses U.S. names for elements when a conflict between common U.S. symbols and those of the International Union of Pure and Applied Chemistry are at variance.

Close space between all abbreviations except names of people: U.S. but R. D. Orme.

Generally, avoid beginning a sentence with an abbreviation.

LIST: For a list of searchable abbreviations, see "Acronyms and Abbreviations" on the INL internal website at https://acronym.inl.gov/.

	Error	Correct Style	Note
rence	lb _f lb _m	lbf lbm	Note standard form for these abbreviations
k Refe	78 kgs, 5 lbs	78 kg, 5 lb	Abbreviations for units of measure do not carry <i>s</i> to indicate plurality
Quic	TLD's	TLDs	No apostrophe for plural acronyms
•	K.cal/mole	kcal/mol	Check abbreviations for capitalization and spelling

ACRONYMS, INITIALISMS: See acronym and initialism.

Abovegrade. One word when used as an adjective: *abovegrade waste*. Two words when used otherwise: *the road sloped above grade*.

Appendix A

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aboveground. One word when used as an adjective: *an aboveground wellhead*. Two words when used otherwise: *all of the tanks are above ground*.

acronym. A word formed from the initial letters of each part of a compound term: *TAN, MOOSE, BISON*. See **abbreviation** and **initialism**.

Avoid overuse of acronyms and initialisms. Generally, reduce only widely familiar terms to acronyms or initialisms and spell out the rest, even though the document may be slightly longer. In any case, use an acronym only if a term is repeated three or more times, or in rare instances where the acronym is better known than the word or words for which it stands: *FBI (Federal Bureau of Investigation), CIA (Central Intelligence Agency)*.

Define acronyms and initialisms at first use in a work. If the practice would lend clarity (as in the case where an initial section is often read by a different audience from that of the main body of the document), define them again in main sections. Generally, do not include acronyms in titles, headings, or captions and never call them out there. An exception is in titles on the cover or title page of a work, or in headings within the body of the work when the next paragraph includes the definition. If you first define acronyms in figure captions or table titles, you should also redefine them at first use in the text. If you define acronyms in a summary, redefine them in the body.

The words defining an acronym are written with initial caps only when they are proper terms or are used as proper terms at INL. An acronym is usually set in uppercase, even when the term it stands for is not a proper term. *EMCB*, for example, stands for *earth-mounded concrete bunker*.

When forming a plural of an acronym or initialism, add a lowercase *s*: *TSs*. Do not separate the *s* from the acronym with an apostrophe unless forming a possessive: *PIs* means more than one principal investigator; *PI's* refers to a PI owning something.

In general, avoid beginning a sentence with an acronym.

See "Acronyms and Abbreviations" <u>https://acronym.inl.gov/</u> for an extensive list of acronyms. The number of approved acronyms in use at INL is so lengthy that it cannot serve as a substitute for calling out and listing acronyms within a technical document, as is common practice in industry.

aftercooler

agreement. A verb must agree with its subject, and a pronoun must agree with its antecedent. SUBJECT-VERB AGREEMENT: A subject and verb must agree in number and person.

—IN NUMBER: A singular subject takes a singular verb: the project begins.

A plural or compound subject takes a plural verb: these projects begin, grading and leveling begin.

Each is singular and takes a singular verb: each teacher participates.

None is usually singular and takes a singular verb: none of the staff is ready.

Data and criteria are plural and require plural verbs: data are used, criteria depend on.

Collective nouns such as *public, group, percent*, and *personnel* take singular or plural verbs, depending on whether the nouns refer to the whole or parts: *The group is made up of 200 employees*, but *The group are all participants*.

Units of measure and subjects that specify amounts take singular verbs: 12 km is, 90 cents is.

A number of always takes a plural verb: a number of projects remain. The number of always takes a singular verb: the number of projects remains.

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The phrases *as well as, together with, along with,* and *in addition to* do not change a singular subject into a plural one. The singular subject stays singular and requires a singular verb: *A Site van, along with the buses, transports the employees.* Include the plural verb only when the phrases follow a plural subject: *Site vans, along with the buses, transport the employees.*

And is the only conjunction that can create a compound subject: DOE and DoD are; DOE or DoD is.

A singular subject modified by coordinate adjectives takes a plural verb: *both intellectual and political freedom are suppressed*.

When one element of a subject is plural and the other is singular, make the verb agree with the nearer element: *Dr. Shipp or senior officers are attending the meeting* but *senior officers or Dr. Shipp is attending the meeting*.

Determine the correct verb number in the following sentence by finding the antecedent of *who*: *The technician is one of the employees who work four 10-hour days*. The antecedent of *who* is *employees*, which is the subject of the phrase *the employees who work four 10-hour days*, so *work*, not *works*, is the correct verb.

—*IN PERSON*: A first-person subject takes a first-person verb: *I am a writer/editor*, not *I is a writer/editor*. A third-person subject takes a third-person verb: *programmers are working around the clock*, not *programmers is working around the clock*.

ANTECEDENT-PRONOUN AGREEMENT: An antecedent and pronoun must agree in number and case.

—IN NUMBER: A singular antecedent takes a singular pronoun: *the company should use its financial resources* not *the company should use their financial resources*.

A plural antecedent takes a plural pronoun: *the employees are bringing their books* not *the employees are bringing his or her books*.

-IN CASE: A subjective antecedent takes a subjective pronoun: I am he not I am him.

all- Compounds beginning with *all-* (e.g., *all-encompassing, all-inclusive, all-around, all-day, allpurpose*) are generally hyphenated when used adjectivally (e.g., *we attended an all-day meeting*), but are written as two words when used otherwise: *we worked all day*.

ampersand. The symbol &, which means *and*. Generally, avoid using the ampersand symbol except in accepted acronyms.

and/or. Avoid this construction, which has limited legitimate use. Instead, use *and* or separately: *The policy may affect employees at CFA and TAN*. In general, avoid using a slash as a means of avoiding a decision over whether *and* or *or* is meant.

anti- Prefix meaning against, opposite. In compound words, join *anti*- with another word without using a space or hyphen: *antiaircraft, antiballistic*. However, use a hyphen when the second element is capitalized (*anti-American*) or begins with *i* (*anti-inflammatory*). See **prefixes** and **hyphen, dash**.

article. Follow these guidelines:

DEFINITE (THE): Use *the* before a noun that denotes a particular person or thing: *read the newsletter*.

There are no hard-and-fast rules defining when to use *the* before an acronym or initialism. Use what is most common in formal writing and speech, or what you prefer.

The is often not used with acronyms of locations and organizations: *CFA* (Central Facilities Area), *DOE* (Department of Energy), *EPA* (Environmental Protection Agency), *INL* (Idaho National

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Laboratory), *ISU* (Idaho State University), *NRC* (Nuclear Regulatory Commission), *OSHA* (Occupational Safety and Health Administration), *WCB* (Willow Creek Building).

The is often used with some acronyms: the PI (principal investigator), the PM (project manager), the wbc (whole body count), the SP (standard practice), the BR (breeder reactor), the WBS (work breakdown structure), the SWP (safe work permit), the PO (purchase order).

INDEFINITE (A, AN): Use a before consonant sounds: a scientist, a project, a historical review, a onetime assignment (sounds as if one begins with w), a united effort (sounds as if united begins with y), a IV-F (pronounced four-f) category, a CUI document.

Use an before vowel sounds: an engineer, an activity, an hour (the h is silent), an 11-year-old, an NRC report (sounds as if NRC begins with en), an R&D program (sounds as if R&D begins with ar).

Whether an acronym or initialism is to be pronounced by spelling it out (I-N-L) or by saying its syllables (FASB) depends on how the majority of people say it. Knowing how the majority of people say it is important in order to know which indefinite article to use: *an L-O-F-T employee*, or *a LOFT employee*.

assure. Assure the manager, but ensure completion and insure property. Assure always takes a personal object: assure your customer. See **ensure**.

ce	Error	Correct Style	Note
Quick eferen	to assure completion	to ensure completion to assure our manager	Use the right term
R		to insure property	

bio- Prefix that indicates life or living organisms. In compound words, join *bio-* with another word without using a space or hyphen: *bioecology, biophysical*. See both **prefixes** and **hyphen, dash**.

brackets. In math, brackets enclose parentheses: $E[(X-\mu)^3]$. Follow this order for parentheses, brackets, and braces:

 $\{[(\{[()]\})]\}$

In text, parentheses enclose brackets: *John (the new engineer [a former NASA employee]) contributed needed expertise*. See **parentheses**.

breaks. Breaking words at the end of lines into fewer than three letters is unacceptable: *co-mpany* or *compa-ny* should be *com-pany*. Use your dictionary when unsure of syllable breaks. Avoid more than two consecutive lines with hyphens at the end of each. Do not split measurements: *3 ft* should never be divided so that *3* ends one line and *ft* begins the next line. To keep the figure and unit of measure on the same line, use a hard space. Do not hyphenate the final word of a paragraph or page.

Brushoff. (noun: workers completed the brushoff) (adjective: brushoff work); **brush off** (verb: brush off the machinery)

building. Capitalize the proper names of buildings, including the word *building* if it is an integral part of the proper name: *the Willow Creek Building*. Other forms: *located in Building 614 at the Central Facilities Area* or *CFA-614*.

by. In dimensions (see **dimensions**), the multiplication sign (×) should be used instead of *by* (e.g., $4 \times 4 \times 8$ -*ft box*; 2×4).

capitalization. Avoid unnecessary capitalization. For example, do not capitalize *plan*, but do capitalize *2001 Waste Management Program Management Plan*, which is the full name of the plan and hence a

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proper noun (see OF COMPOSITIONS under **titles**). In general, lowercase common nouns that are part of a name when they stand alone: *the plan, the laboratory, the president*; however, when referring to Idaho National Laboratory as distinguished from one of its component parts, *the Laboratory* is encouraged when variety is needed.

ORGANIZATION NAMES: Capitalize the full name of organizational units: U.S. Congress; Office of the President; Site Services Branch; Logistical Support Directorate; Document and Publication Services Department; Writing/Editing Section. Also, capitalize partial names of these units: Congress; President's Office; Technical Services; Support Services; Document and Publication Services; Writing/Editing. However, do not capitalize office, branch, directorate, department, section, etc., when used alone, nor government and federal when not part of a formal entity such as U.S. Government Printing Office; Code of Federal Regulations.

BUSINESS TITLES: Capitalize formal business titles (see OF PERSONS under **titles**) when preceding a name: *Department Manager Tad Pearson*. Lowercase titles when used alone (*the department manager attended*), in constructions set off by commas (*Tad Pearson, department manager, attended*), or following an organization name (*the Procurement Directorate manager*). Lowercase terms that are position designations rather than formal titles: *the section supervisor must be notified*.

In legal documents, titles are sometimes capitalized in all instances as part of legal custom. Explanations such as *hereafter known as the "Subcontractor"* often establish such capitalization. Avoid esoteric style where possible, however, since much of the confusion surrounding what is proper language stems from pockets of society making up their own rules.

ACADEMIC DEGREES: Capitalize academic degrees when they are used as a title: *Oliver Hartwig, Master of Science, Chemical Engineering* (see **degree, academic**).

PROPER NAMES: Capitalize common nouns such as river, street, and office only when they are an integral part of a proper name: *Big Lost River, Main Street, DOE Idaho Operations Office*, but *the river sinks, Main and State streets, the town office*. An exception is *Site*, when referring to the operations of INL or Hanford. Capitalize state only when it follows the name of a state (*Washington State*) or when used as part of an official name or title (*State Board of Education*).

DERIVATIVES: In general, capitalize words derived from proper nouns that still retain the meaning of those nouns: *American, Christian, French, Marxism*. Lowercase words derived from proper nouns that no longer depend on those nouns for their meaning: *french fries, phillips screwdriver, venetian blinds, roman type*.

REGULATIONS: Capitalize only when referring to a specific regulation: *DOE Order 5820.2A*, but *a DOE order*.

HYPHENATED COMPOUNDS: In headings, names, and titles, capitalize the second word of a hyphenated compound if the second word is a noun (*Long-Term Monitoring*), or if the first word modifies the second word: *State-Mandated Requirements*.

Do not capitalize the second word if it is a participle modifying the first word or if both words constitute a single word: *English-speaking People, Medium-sized Library, Self-sustaining Reaction*.

ARTICLES AND PREPOSITIONS: Do not capitalize articles (see **article**) or prepositions (see **prepositional phrases**) unless they begin or end a heading, name, or title.

REGIONS: Capitalize terms naming regions: the West, the Intermountain West. See region.

SEASONS: Do not capitalize spring, summer, fall, or winter in regular text, but capitalize these terms in references: *Journal of Adult Education, Fall 2000*.

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GENUS: Whether in lists or run-on text, capitalize the generic Latin name of plants and animals: *Escherichia coli* (note that the species name is lowercased). See GENUS AND SPECIES under **italics**.

OTHER: In general, capitalize nouns that precede figures: Valve 40, Reactor 9, Beams 2 and 3, Table 12, Section 3, Subsection 3.1, Equations 3–8, Mail Stop 1607, Revision 4—but page 2.

Celsius. Abbreviate: C as in 32°C. Formerly *centigrade*.

chemical names and symbols. Follow these guidelines:

STYLE: Lowercase chemical elements and compounds: *potassium, sodium chloride*. Use chemical symbols as specified in CMOS.

Indicate isotopes either by separating the mass number from the element with a hyphen (e.g., *uranium-235, U-235*) or by superscripting the mass number left of the symbol (^{235}U). For nontechnical audiences, hyphenating the isotope is generally preferred, while for technical audiences, superscripting

cities. On first entry in text, include the state after the city: *Idaho Falls, Idaho; Richland, Washington; West Valley, New York.* If the city is a major metropolitan area such as San Francisco, Houston, Philadelphia, or New York, or if the location is well known such as Salt Lake City, Milwaukee, or Orlando, omit the name of the state.

co- Prefix that indicates (a) joint, jointly, together, mutually, or (b) same, similar. To determine if a hyphen is necessary, refer first to this guide, then the most recent edition of <u>*The American Heritage*</u> <u>*Dictionary*</u>, Webster's Fourth New International Dictionary, and the GPO Style Manual. See **prefixes** and **hyphen**, **dash**.

Code of Federal Regulations. Write as 10 CFR 50, not 10CFR50.

Colon. Use a colon to introduce material, particularly material that restates and clarifies what appears before the colon: *The study focused on three critical functions: research, development, and marketing.*

A colon is frequently unnecessary to introduce a run-in list: *The remedial investigation report will* (a) summarize new data, (b) draw conclusions based on the new data, and (c) identify additional data needs for supporting decisions. A colon should never introduce a list introduced by a form of the verb to be. However, the terms as follows and the following require a colon: The results were as follows: (a) Test 1—negative, (b) Test 2—positive, and (c) Test 3—positive.

For clarity, you may wish to insert a colon after text that introduces a vertical or displayed list:

The process requires two steps:

Complete Form 571.01

Submit the form with a copy of the report to Export Compliance Group.

A colon is also a mathematical symbol for ratio: 5:7.

comma. Follow these guidelines:

BEFORE A CONJUNCTION: Precedes a conjunction in a series: rods, cores, and fuels.

BETWEEN INDEPENDENT CLAUSES: Separates two independent clauses: *INL is not funded by that office, but it receives funding from a related one.*

AFTER A CITY AND STATE: Separates a city from a state: *Idaho Falls, Idaho*. Also, separates a city and state from subsequent text: *Idaho Falls, Idaho, in Southeast Idaho*.

IN NUMBERS: Separates numbers of four or more digits: 2,000, 20,000, 200,000, except in years under 10,000 (1998, 6000 B.C.—the year 9999 would not have a comma, but 9,999 years would), page

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numbers, telephone numbers, ZIP Codes, addresses, regulations, orders, decimal fractions smaller than one, temperatures, binary numbers, serial numbers, radio frequency numbers, and numbers of chapters of fraternal organizations. Proper style for dates in text is *September 20, 2001*, (note the comma following 2001).

IN MODIFIERS: Separates compound adjectives that modify a subject: *long-term, contact-operated, low-level radioactive waste casks*.

See use of commas with quotation marks in the **quotation marks** entry.

e	Error	Correct Style	Note
Quick Referenc	rods, cores and fuels	rods, cores, and fuels	Place a comma before the final <i>and</i> in a series

company. Lowercase unless part of a formal name: *Battelle Energy Alliance Limited Liability Company* (*LLC*) *is a new company. Its predecessor was Bechtel BWXT Idaho, LLC.*

companywide. Not company-wide.

complex. It is *DOE* <u>c</u>omplex, not *DOE* <u>C</u>omplex, but ATR Complex (formal name).

compound words. As a general rule, avoid hyphenating compound words. However, use a hyphen if the word is unfamiliar, difficult to read, or has the potential to be confused with another word. In most cases, words that combine the same vowels (e.g., *reestablish*) do not need a hyphen. If you combine two words to form a verb, include a hyphen between them for clarity: *the technicians proof-tested all equipment*.

ce	Error	Correct Style	Note
.en(non nuclear	non-nuclear	While postirradiation fits CMOS
efer	re-evaluate	reevaluate	guidance, post-irradiation has been
Re	post-irradiation	post-irradiation	used at INL for decades as the
ick	pre-existence	preexistence	preferred form and is incorporated into
Qui	off-site	offsite	the name of a division at MFC.
	on-site	onsite	

Conduct of Maintenance. Uppercase when referring to the program. Lowercase otherwise.

Congress. Capitalize when referring to the national legislative body of the United States, consisting of the Senate and the House of Representatives or the two-year session of this legislature between elections of the House of Representatives.

consent order. Capitalize only when part of *Consent Order and Compliance Agreement* or *Voluntary Consent Order*.

cooldown (noun: *accelerated cooldown*) (adjective: *cooldown capability*); **cool down** (verb: *cool down the reactor*)

copyright. Title 17 of the U.S. Code gives authors immediate title to "original works of authorship." This ownership exists from the time the work is created in fixed form. Ownership includes the exclusive right to copy or prepare derivative works based on the work—hence the term *copyright*.

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Unless a license or permission has previously been granted to BEA, obtain written permission from the copyright owner before copying or using copyrighted material to prepare derivative works.

corporation. Lowercase unless part of a formal name: *Lockheed Martin Corporation is a hightechnology company. The corporation is a combination of the former Lockheed and Martin Marietta corporations.*

Do not abbreviate corporation in text: corporation not corp.

counter- Prefix that indicates (a) opposition, as in direction or purpose, or (b) reciprocation. In compound words, join *counter-* with another word without using a space or hyphen: *countercurrent, counterrevolution, counterproposal*. See **prefixes**.

dash. See hyphen, dash.

data. (plural: *these data are*); **datum** (singular). The distinction is no longer observed in common usage, but is preferred in formal and scientific writing.

ce	Error	Correct Style	Note
Quick Referen	This data is	These data are	The term data is plural. Datum is the singular form of data.

daylight-saving time. But Mountain Daylight Time.

de- Prefix that means to reverse or remove from. In compound words, join *de*- with another word without using a space or hyphen: *deactivate, decommission, debrief.* See **prefixes** and **hyphen, dash**.

decimal. Use a zero before a decimal fraction: 0.013.

ce	Error	Correct Style	Note
Quick Referenc	.013 .1764	0.013, 0.1764	Always place a zero before a decimal fraction

degree, **academic**. Abbreviate academic degrees using this form: *B.A.*, *M.S.*, *Ph.D.*, *M.Ed*. Capitalize degrees that precede a name: *Doctor of Mechanical Engineering Dale J. Claflin*. Otherwise, lowercase degrees: *a bachelor's degree, a master's degree, a master of science degree, a doctoral degree, the educator has a doctorate in psychology*.

degree, angle. Spell out *degree* when referring to angles: 45-degree angle.

ce	Error	Correct Style	Note
Quick Referen	31° angle	31-degree angle	Degree spelled out for angles

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degree, temperature. The degree symbol (°) is used with measures of temperature, except kelvin: $32^{\circ}F$, $97^{\circ}C$, 921 K. There is never a space between either the measurement and the degree sign or the degree sign and the measurement system.

	Error	Correct Style	Note
rence	32° F, 97C, 921°K	32°F, 97°C, 921 K	Degree symbol used with F and C , not K . No space between $^{\circ}$ and F or C
tefe	31 degrees C	31°C	Use ° sign used for temperature
uick R	between 20°C and 50°C	between 20 and 50°C	Avoid using redundant words and abbreviations
ð	31° angle	31-degree angle	Degree spelled out for angles
	in degrees centigrade	in degrees Celsius	Celsius is now the standard

Department of Defense. *DoD* is preferred over *DOD*.

dimensions. Include a space on both sides of the multiplication sign: 7×10 -m plate. The multiplication sign (×) should be used instead of x or by. By convention, two dimensions are cited by width then length. Three dimensions are cited by depth, width, and then length.

DOE complex. Not *DOE Complex*.

dollars. Use *\$* with numerals: *the bid was \$33,000*. In text, spell out *million* and *billion*: *\$10 million, \$2 billion*. Use *K*, which means thousand, and *M*, which means million, in budgets or tables in which the symbols are frequently used or requested: *\$20K, \$10M*. Be sure dollar amounts are clear: *\$10 to \$20 million* is different from *\$10 million to \$20 million*. Constructions such as *thousands of dollars* or *millions of dollars* are acceptable when figures are not given. Amounts take singular verbs: *\$500,000 is the budget DOE approved*.

e.g. Abbreviation of *exempli gratia*, a Latin term meaning for example. Follow the abbreviation with a comma: *e.g., pumps, valves, and flow lines*. Avoid using *e.g.* and *etc.* in the same sentence. See **i.e.**. Do not use Latin abbreviations in procedures. See **foreign terms**.

ce	Error	Correct Style	Note
Quick Referen	e.g., rods, cores, fuels, etc.	(e.g., rods, cores, and fuels)	Using both <i>e.g.</i> , and <i>etc</i> . is redundant; use <i>i.e.</i> , for "that is"; use <i>e.g.</i> , for "for example"

ellipsis. Use an ellipsis to indicate the omission of words from information you are quoting: "*Discard unnecessary papers…and return unwanted books.*"

When omitting words at the end of a sentence that remains a sentence, place the period or other ending punctuation mark after the ellipsis: *"Four score and seven years ago, our fathers brought forth on this continent a new nation...."*

When material is deleted at the end of one paragraph and at the beginning of the paragraph that follows, place an ellipsis in both locations.

Email. Email is preferred over e-mail. However, either is acceptable as long as it is consistent within the document.

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emdash. Emdash without a space or hyphen between em and dash is preferred. Depending on the context, the emdash can take the place of <u>commas</u>, <u>parentheses</u>, or <u>colons</u>—in each case to slightly different effect. However, it is best limited to two appearances per sentence to avoid confusion. See **hyphen**, **dash**.

	Error	Correct Style	Note
Quick Reference	The new employee the last employee was hired in 1987 expressed excitement, also: –	The new employee—the last employee was hired in 1987—expressed excitement	Use an emdash to indicate a break in thought. Do not use spaces on either side of the emdash

endash. Endash without a space or hyphen between en and dash is preferred. Endashes are used to indicate a range (*pages 14–25*). In other cases, they replace the word *to* in specific situations. See **hyphen, dash**.

	Error	Correct Style	Note
eference	The meter showed a range of 10-20 mm.	The meter shows a range of 10–20 mm.	Use an endash (without spaces on either side) rather than a hyphen to indicate a substitution of the word <i>to</i> in inclusive information
Quick R	The new employee the last employee was hired in 1987 expressed excitement, also: –	The new employee—the last employee was hired in 1987—expressed excitement	Use an emdash to indicate a break in thought. Do not use spaces on either side of the emdash

equations. Type equations flush left with letters in roman or italic (italic is usually the default in word-processing software):

$$A \frac{\partial(\rho)}{\partial t} = -\frac{\partial}{\partial x} 0.33 \left[W \left(h + \frac{v^2}{2} \right) + 3162 + q_w \frac{\partial A_w}{\partial x} \right]$$
(1)
where

$$A = flow area
\rho = fluid density
W = mass flow rate
v = fluid velocity. Place a period after the last definition.$$

The type style of roman or italic for letters should be consistent, whether in the equation, in text, or in *where* lists. Note that the above equation number is in parentheses flush right, in line horizontally with the last line (in this case, the only line) of the equation.

When referring to the equation in text, enclose the number in parentheses: *Equation (1)*. Equations can also be designated by section: *Equation (2-5)*. Number equations in appendices using the appendix letter designation, if applicable: *Equation (A-3)*.

For correct order of parentheses, brackets, and braces in math see brackets.

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ce	Error	Correct Style	Note
Quick Referen	found in equation 139	found in Equation (139)	Initial cap <u>Equation</u> and enclose number in parentheses

et al. Abbreviation of *et alii*, a Latin term meaning "and others." In general, use *et al.* in an author-date reference to indicate three or more authors in addition to the principal author: *(Jones et al. 1986)*.

Do not use Latin abbreviations in procedures. See foreign terms.

ex- The prefix *ex-* (meaning former) is always hyphenated: *ex-president*. See **prefixes** and **hyphen**, **dash**.

federal. Except for formal names such as *Federal Express* and *Federal Trade Commission*, lowercase: *federal assistance, federal court, federal judge, federal government*. See **government**.

firefighter. Not fireman.

fiscal year. Abbreviate FY-19 or FY 2019, or spell out: Fiscal Year 2019. Spell out on first use.

e	Error	Correct Style	Note
Quick Reference	FY99 FY2000	FY-99 FY 2000	Use hyphen with no century identification; use space with century identification

flammable. Not *inflammable* (although *inflammable* is technically correct, it is widely taken to mean unflammable or nonflammable, which is just the opposite of its meaning).

Fluor Idaho, LLC. Abbreviate: Fluor. Fluor began work in June 2016 as the contractor for the Idaho Cleanup Project (ICP) at the Idaho National Laboratory (INL). The contract runs through 2020. Fluor is responsible for treatment and disposal of radioactive waste; retrieval, disposal and other remediation related to buried waste; safe management of spent nuclear fuel; disposition of nuclear materials; disposition of reactor and non-reactor nuclear facilities; and other environmental remediation activities.

foreign terms. Use foreign words, phrases, and abbreviations sparingly (never in procedures), usually when they support discussion of foreign source material, foreign-derived research and technology, or are common in a specific discipline.

Set familiar foreign words and phrases in standard type (e.g., a priori, fait accompli, in situ), and set unfamiliar foreign terms in italics, defining the terms parenthetically: *forschung* (research), *un poele* (stove). Set common Latin abbreviations in standard type: ibid., etc., et al. Do not italicize proper foreign names: Moskova, Braunschweig.

formulas, formulae. Plural of *formula*.

fractions. Use Arabic numerals for fractions of units of measure: 5/8 in., 1-9/16 kg, 1/2 gal. Spell out fractions less than one that are not units of measure (*two-thirds, nine-tenths*), but use Arabic numerals for fractions greater than one (5-1/2, 14-2/3).

glovebox.

go/no-go gauge.

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government. Except for U.S. Government, lowercase: federal government, state government, the government.

greater-than-Class C low-level waste

half-life

hard copy (noun); hard-copy (adjective)

headquarters. In general, lowercase the term: *the scientist works at headquarters* but *DOE Headquarters (DOE-HQ). Headquarters* generally takes a singular verb, although it can take a plural verb: *Army headquarters were in Paris and Rome.*

heatup (noun: completed heatup) (adjective: heatup period); heat up (verb: heat up the facility)

HNu. Photoionization detector.

home page. (two words)

hot cell (noun); hot-cell (adjective)

hot-rolled.

hyphen, dash. Differentiate hyphens, endashes, and emdashes.

HYPHEN (-): In most typefaces, a hyphen is one-third the length of an emdash. Use hyphens to connect words and avoid ambiguity: *He recovered his health*. *He re-covered his roof*. When a compound modifier precedes a noun, hyphens are often used to link all the words in the compound for clarity: *full-time job*, *green-and-white dress*. Exceptions are for the adverb *very* and all adverbs that end in *ly*: *a very good time*, *an easily read report*.

Most compound modifiers that follow nouns are not hyphenated: *She works full time*. However, if modifiers that are usually hyphenated before a noun follow a "to be" verb, a hyphen may be used for clarity: *The regulation is ill-conceived; The meeting was time-consuming*.

Use hyphens to break up three or more of the same letters: *shell-like*. Also, use hyphens to join some prefixes and suffixes: *anti-icing*, *INL-wide* (see **prefixes** and **suffixes**). Breaking words at the end of lines into fewer than three letters is unacceptable: *co-mpany* or *compa-ny* should be *com-pany*.

Avoid more than two consecutive lines with hyphens at the end of each line. Do not hyphenate the final word of a paragraph or page. Do not allow a hyphenation to cross a page break (but hyphenation between columns on the same page is acceptable).

Hyphenate units of measure used as modifiers: *4-oz packages, three-fourths-in. pipe*. Do not split measurements: *3-ft* should never be divided so that *3-* ends one line and *ft* begins the next one. To keep the figure and unit of measure on the same line, use a hard hyphen.

Include a hyphen between two words forming a verb: technicians proof-tested the equipment.

SUSPENDED HYPHEN: When the second part of a hyphenated expression is omitted, the hyphen is retained, followed by a word space: *one- and two-column formats*. But, do not repeat a hyphen when a closed compound word following the space: *over- and underfed cats*, but *overfed and overworked mules* (not overfed and –worked mules). [The Chicago Manual of Style, 15th Edition]

Do not precede items of a list with a hyphen when the first item is hyphenated: Phase-1, 2, or 3.

ENDASH (–): An endash is usually half the length of an emdash. Use endashes principally to indicate continuing or inclusive letters or numbers: *Appendices A–E, temperatures 80–100°C, 50–100 miles from ground zero, 10–3*. Do not use an endash as a substitute for *to* when preceded by *from* (not *from 80–*

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100°C but from 80 to 100°C). Do not use an endash as a substitute for and (not between 1968–1970 but between 1968 and 1970). The endash is also used in place of a hyphen in a compound adjective, one element of which consists of two words or of a hyphenated word: New York–London flight, post–Civil War period.

EMDASH (—): An emdash is normally twice the length of an endash or three times the length of a hyphen. It marks a sudden change of thought, unfinished thought, or parenthetical words or phrases requiring more forceful setting off than using commas or parentheses: *The new employee*—the last employee was hired in 1987—expressed excitement.

For strictly typographical applications, such as to follow subheadings, emdashes can often be interchanged with periods, colons, or spacing.

	Error	Correct Style	Note
ference	2 m sensor 5-m long	2-m sensor 5 m long but 5-m-long bar	Use a hyphen in combinations of numerals and units or measurement used as compound adjectives
Quick Re	7x10-m ² plate 7 by 10-m ² plate	7×10 -m ² plate	Use multiplication sign rather than text font x , with one space on both sides of \times ; multiplication dot would also have one space on either side
	5 1/2	5-1/2	Use a hyphen for mixed numbers

in accordance with. Agreement with or conformity to: *Safety categories for INL facility components* are determined in accordance with LWP-13014, "Determining Quality Levels." In LIs, use per. See per.

in-core. Or inpile (adjective)

indexes. Plural of *index* (*indexes* is preferred over *indices*, because *indices* can refer to a mathematical expression).

inflammable. See flammable.

infra- Prefix that indicates below, beneath, or inferior to: *infrasonic*. In compound words, join *infra-* with another word without using a space or hyphen: *infrared, infrastructure*. See **prefixes** and **hyphen, dash**.

initials. Include a space between initials: W. J. Stewart, W. E. May. Close other abbreviations: U.S., P.O.

initialism. An acronym formed from the initial letters of two or more words, one that is pronounced as separate letters: *rpg, DOE, INL, DoD, ATR* (see **acronym** and **abbreviation**). For other initialisms and abbreviations, search the "Acronyms and Abbreviations" database at <u>https://acronym.inl.gov/</u>.

inpile (noun, adjective)

Institute of Nuclear Power Operations. Abbreviate: INPO.

Integral sign. The sign: $\int C$ orrect spacing: $\int_{b}^{a} x dx$.

inter- Prefix that indicates (a) between or among or (b) mutually or together. In compound words, join *inter-* with another word without using a space or hyphen: *interconnect, interpolate*. However, use a hyphen if the second element is capitalized: *inter-Canadian*. See **intra-**, **prefixes**, and **hyphen**, **dash**.

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intra- Prefix that indicates in, within, or inside. In compound words, join *intra-* with another word without using a space or hyphen: *intramolecular*. However, use a hyphen if the second element is capitalized or begins with *a*: *intra-INL*, *intra-atomic*. See **inter-**, **prefixes**, and **hyphen**, **dash**.

italics. Follow these guidelines:

COMPOSITIONS: See OF COMPOSITIONS under titles.

GENUS AND SPECIES: Whether in lists or run-on text, italicize the generic and specific Latin names of plants and animals: *Escherichia coli* (note the capitalization of the genus name).

WORDS AS WORDS: Italicize a word when it is used to mean a word instead of the concept the word normally symbolizes:

Idaho was not derived from an Indian word as popularly believed. A mining lobbyist invented *Idaho* in 1860.

EMPHASIS: Italicize a word for emphasis:

Embed figures within text as space permits after their mention in the narrative.

-ize. Suffix meaning to be or become. Avoid using *-ize* to make a noun a verb: not *prioritize your activities* but *set priorities for your activities*. See **suffixes**.

job code. A project number (e.g., *Job Code: A6038*) for NRC reports. Place this code, which was formerly known as the financial identification number (FIN), must appear on the title page of all NRC-sponsored reports at the end of the "Prepared for..." statement and at the bottom center of the abstract page.

K. Means Kelvin when used to denote temperature. Do not use the degree symbol: *921 K*. It also means one thousand dollars when used with budget figures: *\$76K*.

keycard

letters. Do not use an apostrophe (see **apostrophe**) when forming the plural of a letter: *Ts*. In the case of lowercase letters used as nouns and of uppercase letters that would be confusing if *s* alone were added, form the plural with '*s*: *x*'s and *y*'s, *S*'s, *A*'s, *I*'s, *M*.*A*. 's. See **possessives**.

letters as shapes. If possible, use sans serif (see **sans serif**) letters to indicate shape: *V-shaped*, *S curve*, *A frame*. An exception is *I-beam*. In this case, a serif (see **serif**) font represents the intended shape better than an *I* from a sans serif font. Do not place the letter in quotes: *U-shaped* not "*U*"-shaped. See **mathematical signs**.

long-term stewardship. The sustained effort to protect human health and the environment once facility cleanup is complete. The effort consists primarily of preventing exposure to residual contamination and waste.

loss of coolant (noun); loss-of-coolant (adjective)

low level (noun); low-level (adjective: *low-level waste*)

macro- Prefix that indicates (a) largeness or longness in extent, duration, or size; or (b) abnormal largeness or overdevelopment. In compound words, join *macro-* with another word without using a space or hyphen: *macrosphere, macromolecular, macroscopic*. See **prefixes** and **hyphen, dash**.

magnification. In external reports use the multiplication sign (\times) (see **multiplication sign**) as the symbol for magnification: 200 \times .

mail stop. Abbreviate: MS (noun); mail-stop abbreviate: MS (adjective: mail-stop location)

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man-days. To avoid gender bias, *worker-days* is preferred.

ce	Error	Correct Style	Note
Quick Referen	He performed	The operator performed	Avoid gender-specific language

master-slave manipulator. Abbreviate: M/S manipulator.

mathematical signs. Include a space on both sides of mathematical operational signs in equations: X < 0.1 < Y or X = 1.5, but do not separate math signs from numerals that stand alone: -5, $\ge 10^{\circ}$ F.

Use formal mathematical symbols such as the multiplication sign (\times) and the minus sign (-) available in Microsoft Word. The "Symbol" font, found under the Insert/Symbol menu, is preferred, but the "Normal Text" font may be used, just be consistent throughout the document. See **letters as shapes** and **scientific notation**.

Note $X < 0.1 < Y$ $X < 0.1 < Y$ $X = 1.5$ <	veen al sign

mean free path (noun); mean-free-path (adjective)

measures. Use the International System of Units (SI) (see **SI**)—the authorized metric system—for metric units of measure. You may place U.S. Customary System units in parentheses after SI units. For brochures and reports intended for public distribution, use U.S. Customary System units. (Customers or technical monitors may require U.S. Customary System or British Imperial System units in public and nonpublic documentation for safety considerations, general accessibility, or audience preference.)

Do not use s plurals when abbreviating units of measure: 78 kg, not 78 kgs.

Avoid repetition in units of measure: between 20 and 50°C, not between 20°C and 50°C.

Ge	Error	Correct Style	Note
Quick Referenc	31′8″	31 ft 8 in.	<i>ft</i> and <i>in</i> . are the preferred abbreviations

meltdown (noun, adjective); melt down (verb)

meta- Prefix that indicates (a) beyond, transcending; (b) changed or involving change; (c) alternating; or (d) situated behind (anatomy). In compound words, join *meta-* with another word without using a space or hyphen: *metaphysical, metastable.* See **prefixes** and **hyphen, dash**.

micro- Prefix that indicates (a) the smaller, inner, or more detailed of two contrasting things; (b) amplification or enlargement; or (c) one-millionth (10^{-6}) . In compound words, join *micro*- with another word without using a space or hyphen: *micrometer, microorganism*. However, use a hyphen if the second element is capitalized. Words beginning with *o* are joined with a hyphen only if the term is unfamiliar: *micro-optics*. See **prefixes** and **hyphen**, **dash**.

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mid- Indicates a middle part, time, or location. Join *mid-* with another word without using a space or hyphen: *midstream, midsemester*. However, use a hyphen if the second element is capitalized or is a numeral: *mid-April, mid-Victorian, mid-1989*. Also, use a hyphen to avoid confusion: *mid-decade*.

military specification. Refer to a military specification using the form: *MIL-P-XXXXX* (*rotary type specified by MIL-P-17608*).

million. Abbreviate: M (use the abbreviation primarily in tables for budget figures: *\$15M*. In text, spell out: *million*).

money. Use United States currency terms (\$1.50, \$200, \$400,000, \$5M, etc.)

ce	Error	Correct Style	Note
Quick Referenc	\$821 k	\$821K	In budget numbers, use <i>K</i> closed up to indicate thousands of dollars

multi- Prefix that indicates (a) many or much or (b) more than one. In compound words, join *multi-* with another word without using a space or hyphen: *multilateral, multifaceted, multiconductor*. However, use a hyphen if the second element begins with i: *multi-indicator*. See **prefixes** and the **hyphen, dash**.

multiplication sign. Use \times , not x. See mathematical signs.

NaK. Sodium potassium alloy; used as a reactor coolant.

names. Follow these guidelines:

OF PERSONS: The name by which a professional chooses to be known is best known by asking the person. When inquiry is not personal, follow these guidelines on covers and title pages, spell out the first name and last name and include the middle initial: *John J. Teunessen*. When full names are unknown, include a space between initials: *J. J. Teunessen*.

When *Jr.*, *Sr.*, *II*, 2^{*nd*}, *III*, 3^{*rd*}, etc., is used with a name, do not precede the term by a comma: *Robert G. West III*.

See capitalization and titles.

nano- Prefix meaning extremely small: *nanoplankton*. Also, one-billionth (10⁻⁹).

non- Prefix that denotes not. In compound words, join *non*- with another word without using a space or hyphen: *nonvolatile*. However, use a hyphen if the second element is capitalized: *non-U.S.*. See **prefixes** and the **hyphen, dash**.

noon. Not *12 p.m.* or *12 a.m.*

NRC external report. Abbreviate: NUREG or NUREG/CR. In a strict sense, *NUREG* means an NRC external report prepared by NRC; *NUREG/CR* means an NRC external report prepared by a contractor for NRC.

numbers. The abbreviation for *number* is *no*. and for *numbers* is *nos*.; however, avoid abbreviating the terms in text.

Use roman numerals (*ii*, *iii*, etc.) for (a) page numbers of a technical report's front matter, (b) wars (*World War II*), and (c) names (*Alexander B. Williams III*). Use Arabic numerals otherwise: *Section 5*.

FIGURES OR WORDS? In general, spell out whole numbers below 10 (zero, nine). Use Arabic numbers for whole numbers above nine: 18, 2,000, 642,000. This rule applies when a sentence contains numbers

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both above and below 10: *The shipment included 14 computers, each of which included three drives.* Exceptions to the rule are when units of measure (see **units of measure**), including time, are used (5 months, 9 pounds, 1 day, 7 years, 3 quarters); and when numbers follow nouns: *Reactor 9, Section 3, Revision 4, Route 1.*

In general, spell out fractions: *two-thirds, nine-tenths*. Use figures for fractions combined with a number (2-1/2 cartons, 8-1/2-x-11-in. paper) and for fractions combined with a unit of measure (1/2 V, 5-2/3 gal).

When two numbers occur side by side, spell out the first number through 99: eighty 1-5/8-in. bolts, sixteen 3/4-in. binders. After 99, use figures: 154 1-5/8-in. bolts, 108 3/4-in. binders.

Spell out a number at the beginning of a sentence: *Twelve laborers participated*. Years are the exception: *1976 was a period of significant growth*.

If a long number must be spelled out, use a hyphen after *y*: *seventy-two*. Also, use hyphens with fractions: *three-fourths*.

Place a zero before a decimal fraction: 0.013.

When not dealing with fractions, always spell out *first* through *ninth*. Starting with *10th*, use figures. However, use *1st*, *2nd*, *3rd*, *4th*, etc., when the sequence is part of a name: *1st Street*, *7th Fleet*, *1st Sgt*.

c,	Error	Correct Style	Note
uick erence	1000	1,000	Generally, use commas in numbers over 999
C Ref	Table III, Figure II	Table 3, Figure 2	Number tables and figures with Arabic numerals

offsite (adjective, adverb), but off-Site (adjective, adverb) when referring to the desert portion of INL or Hanford. See Site.

onsite (adjective, adverb), but **on-Site** (adjective, adverb) when referring to the desert portion of INL or Hanford. See **Site**.

order. Capitalize only when naming a specific regulatory order: DOE Order 5820.2A but the DOE order.

over. It generally denotes spatial relationships: *Steam from the plant drifted over the complex*. Avoid using *over* when dealing with numbers: *more than 300 employees attended* is better than *over 300 employees attended*. See **over-**.

over- Prefix that indicates (a) superiority of rank or power, (b) location above or across a specified position, (c) passage beyond or above a limit or boundary, (d) movement or transferal to a lower or inferior position, or (e) quantity in excess of what is normal or desirable. In compound words, join *over*-with another word without using a space or hyphen: *overlord, overlay, overlong, overanalyze, overexert, oversimplify, overreact.* See **over, prefixes**, and **hyphen, dash**.

page, pages. Abbreviate: p., pp. Spell out page in text.

parallel construction. To improve flow and heighten impact, organize related thoughts in grammatically parallel terms: *please complete the work, sign the form, and telephone the manager*, not *please complete the work, sign the form, and the manager should be telephoned.*

USING *BOTH*: Beware of both. What follows *both* should be consistent before and after a conjunction. Consider these examples: *both for processors and for printers*, not *both for*

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processors and printers. Also: for both processors and printers, not for both processors and for printers.

parentheses. Plural of parenthesis.

	Error	Correct Style	Note
ick rence	[shown in Figure 1 (see	(shown in Figure 1 [see	In text, parentheses enclose brackets
Qu Refei	([]), (())	$\{[(\{[()]\})]\}$	In math, brackets enclose parentheses

peer reviewed. Examined by experts prior to publication.

per. *Per* has three meanings: for each (e.g., *per gallon*), by means of (e.g., *per the bearer*), and according to (e.g., *seated per rank, performed per instructions*). See **in accordance with**.

percent. Abbreviate: %. The symbol is preferred when used with numbers: 98%. Otherwise, spell out: *percent of error*.

ce	Error	Correct Style	Note
Quick Referen	89 percent	89%	Use % sign unless number is spelled out

performance assessment (noun); performance-assessment (adjective)

plus. In general, use *plus* for addition-type statements: *Employee contributions, plus investment earnings, help build an ample retirement savings.* Use *in addition* or *additionally* in lieu of *plus* to begin a sentence: *In addition, a pension plan bolsters retirement benefits.*

possessives. Follow these guidelines:

Show possession by adding 's or ' to nouns. In the absence of ownership, do not use an apostrophe (see **apostrophe**): 20 years of experience, not 20 years' experience, 2 weeks of vacation or 2 weeks vacation, not 2 weeks' vacation.

SINGULAR NOUNS: Form the possessive singular of nouns, including those ending with *s* or an s sound, by adding an apostrophe and an s: *office's, computer's, bus's, Chris's, Jones's, Watkins's, Schmitz's*.

PLURAL NOUNS: Form the possessive plural of nouns ending in *s* by adding only an apostrophe: *operators'*, *visitors'*, *medicines'*, *Joneses'*.

INDIVIDUAL POSSESSION: To show individual possession, add 's to each noun: Fred's and John's projects.

GROUP POSSESSION: To show joint or group possession, add 's to the last noun: Fred and John's project.

See letters.

post- Prefix that means (a) after in time, later, subsequent to or (b) after in position, behind, posterior to. When forming most compound words, join *post*- with another word without using a space or hyphen: *postdoctoral, postwar*. However, use a hyphen if the second element is capitalized: *post-Vietnam*. See **prefixes** and **hyphen, dash**.

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post-irradiation.

pre- Prefix that indicates (a) an earlier or previous time, (b) preliminary or preparatory work or activity, and (c) a location in front of or anterior to. In compound words, join *pre-* with another word without using a space or hyphen: *prearrange, preoperations*. However, use a hyphen if the second element is capitalized: *pre-World War II*. A hyphen is also preferred if the compound word involves three or more sequential vowels that are difficult to read: *pre-aerate*. See **prefixes** and **hyphen, dash**.

prefixes. The general rule is to avoid hyphenating prefixes when forming compound words. However, use a hyphen if the word is unfamiliar, is difficult to pronounce, or has the potential to be confused with another word. In most cases, no hyphen is recommended for words that combine with the same vowel: *reestablish.* However, use a hyphen if the second element is capitalized: *pre-Bechtel.* Refer first to this guide, then to the most recent edition of *The American Heritage Dictionary*, *Webster's Fourth New International Dictionary*, and the *Government Printing Office Style Manual* for specific word compounding.

prepositional phrases. Avoid stringing prepositional phrases together: A site development plan for all of the facilities operated by BEA in Idaho Falls and at the Site is prepared by personnel in the Facility Planning Section of the Facility and Maintenance Department in Building 614 at the Central Facilities Area at the Site. Split the sentence into smaller active sentences: Facility Planning prepares the site development plan. This plan covers BEA-operated facilities at the Site and in Idaho Falls. Planners work primarily in CFA-614.

e	Error	Correct Style	Note
Quick Referenc	effect of abrasion in the shell before burnup on the surface of the product	effect shell abrasion had on the product surface before burnup	Avoid stringing prepositional phrases together

pro- Prefix that indicates (a) favor or support; (b) before in time or position, or forward; or (c) acting as. In compound words, join *pro-* with another element without using a space or hyphen: *pronuclear, procambium, pronoun*. However, use a hyphen if the second element is capitalized: *pro-American*. It is also preferable to use a hyphen if the compound word contains three or more sequential vowels that are difficult to read: *pro-aesthetic*. See **prefixes** and **hyphen, dash**.

proof of principle (noun); proof-of-principle (adjective)

quotation marks. Place closing quotation marks outside commas and periods: "*the rod melted*," "*the rod melted*." Also: *the rod was "hot*."

Place closing quotation marks inside colons and semicolons ("the rod melted": "the rod melted";).

Place closing quotation marks outside other marks of punctuation only if the punctuation is part of the quoted matter: *He replied*, *"What is the answer?"* but *The manager yelled*, *"Where are you going?"*!

Material set off from the text as a displayed quotation is indented one tab from the left and right margins and is not enclosed in quotation marks:

The basis of validation will be the extent to which stakeholders in the Intermountain West are involved in developing the cooperative regional program for environmental sciences (focusing on subsurface issues) and the level of commitment they make to its future implementation (FY 2001 Performance Evaluation Measurement Plan, Measure 4.3.2.3).

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See OF COMPOSITIONS under **titles** for information on placing quotation marks around titles and headings.

ce	Error	Correct Style	Note
Quick Referen	"The rod melted".	"The rod melted."	Always place commas and periods inside closing quotation marks

radiation. Energy moving through space in the form of waves and particles. Radiation is everywhere in, around, and above the world in which we live, a natural energy force surrounding us.

Depending on how much energy it has, radiation can be described as either nonionizing (low-energy) or ionizing (high energy). Nonionizing radiation (see **nonionizing radiation**) includes radio and television waves, microwaves for cooking, illumination from electric light bulbs, and ultraviolet light for growing indoor plants. Ionizing radiation (see **ionizing radiation**) includes alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing electrically charged particles.

re- Prefix that indicates restoration to a previous condition or repetition of a previous action. In compound words, join *re-* with another word without using a space or hyphen: *refurbish, renovate, reedit, reexamine, reentry, retry.* However, use a hyphen if the compound word contains more than two sequential vowels that are difficult to read: *re-aerate.* See **prefixes** and **hyphen, dash**.

region. In general, lowercase *north, south, northeast*, etc., when indicating compass direction: *The bus traveled northeast*. Uppercase these terms when indicating a region: *The Northeast is a major population center*.

ENVIRONMENTAL PROTECTION AGENCY (EPA) REGIONS: Use a abic or roman numerals to designate one of the EPA's 10 regions: *Region 6* (or *VI*).

scientific notation. A simple method of expressing large numbers as powers of 10. There are two forms of scientific notation: 3.2E+14 and 3.2×10^{14} (both of which stand for 320,000,000,000,000). When using the second form, use a multiplication sign (×). Either form is acceptable, if consistent. Use the emdash (–) rather than the hyphen to represent the negative notation; 3.2E-14, not 3.2E-14.

self- Prefix that indicates one's self, or itself; and things toward, by, or for self. Use a hyphen (e.g., *self-contained, self-driven*) unless *self* is joined with a suffix: *selfless*. See **prefixes**; **hyphen, dash**; and **suffixes**.

semi- Prefix that indicates (a) partly or partially, (b) half of, or (c) occurring twice within a particular period. In compound words, join *semi-* with another word without using a space or hyphen: *semiconductor, semiemperical.* However, use a hyphen if the second element is capitalized or begins with *i: semi-American, semi-independent.* See **prefixes** and **hyphen, dash**.

semicolons. Use a semicolon:

- Between closely related independent clauses: *The smaller unit uses the 75-kW water-cooled torch; the larger unit uses a 600-kW torch.*
- Between items in a series that contain commas: *pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA); the Superfund Amendments and Reauthorization Act of 1986 (SARA); the National Contingency Plan; and applicable DOE orders, directives, and policies.* However, you may forgo semicolons between items in a series if a comma

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appears only in the last item: *pursuant to CERCLA, SARA, the National Contingency Plan, and applicable DOE orders, directives, and policies.*

- Between items in a series that contain commas and are separated by letters or numbers: *The Phase-II RI/FS Work Plan will (a) incorporate findings of the Phase-I RI to describe sources, pathways, and receptors of contaminants; (b) describe any new characterization work required and why; and (c) include findings of early stages of the feasibility study and risk assessment.* However, you may forgo semicolons between items in a series that are separated by letters or numbers if a comma appears only in the last item: *The Phase-II RI/FS Work Plan will (a) incorporate findings of the Phase-II RI, (b) describe any new characterization work required, and (c) include findings of early stages of the RI, feasibility study, and risk assessment.*
- Before conjunctive adverbs or other transitional expressions that connect independent clauses: *TRU* elements will also be oxidized in a reducing melt; however, plutonium oxyhydroxides exist in the melt.
- Between independent clauses separated by a coordinating conjunction when at least one of the clauses contains two or more marks of punctuation: *Piping transfers waste to the large, rectangular, inner chamber; and the intermediate door closes, activating a switch to open the inner furnace door.*

shall. Used before a verb in the infinitive to denote an order, promise, requirement, or obligation: *shall follow. Will* and *must* are alternatives. Compare **should** and **may**. Avoid using *shall, will,* or *must* in procedures; rather, begin procedure steps with an action verb: *Open the valve* rather than *Shall open the valve*.

shape. See letters as shapes.

sic. Means to read the construction as it stands. The term is used to indicate original spelling or usage. The form [*sic*] is often used following a surprising or paradoxical word, phrase, or fact that may or may not be an intentional mistake by the author. *Sic* is frequently used following a misspelled or wrongly used word in the original. (Note that *sic* is a complete word, not an abbreviation. Therefore, it takes no period.)

Sitewide.

source term (noun); source-term (adjective)

state. Capitalize *State* when it follows the name of the state (Idaho *State*) and when used as an accepted part of the name. Lowercase when preceding the name: *Although the state of Idaho benefits economically from INL, the state's largest industry is agriculture.* See **state names**.

state names. Spell out a state name in text, even when the name follows a city: *Minneapolis, Minnesota*. Abbreviate state names only in tabular matter as necessary according to the first form illustrated in Table A-2 (the second form of two letters is for a mailing address with ZIP Code only).

PUNCTUATION: Place a comma between the city and state name, and after the state name, unless the name ends a sentence: *The group traveled from Idaho Falls, Idaho, to Richland, Washington*.

sub- Prefix that indicates (a) under or beneath, (b) inferior or secondary in rank, (c) somewhat short of or less than, or (d) forming a subordinate or constituent part of a whole. In compound words, join *sub-* with another word without using a space or hyphen: *subaqueous, subatomic, subcontract(or)*. See **prefixes** and **hyphen, dash**.

subject-matter expert. Abbreviate: SME. An individual recognized by INL as having sufficient expertise to interpret requirements in a subject area.

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suffixes. The general rule is to avoid hyphens when forming compound words: *lifelike, lilylike*. Use a hyphen only to avoid tripling consonants or when the first element is a proper noun: *shell-like, Scotland-like*. For specific word compounding, refer first to this guide, then to the most recent edition of <u>The</u> <u>American Heritage Dictionary</u>, Webster's Fourth New International Dictionary, and the Government Printing Office Style Manual.

super- Prefix that indicates (a) placement above, over, or outside; (b) superiority in size, quality, number, or degree; (c) a degree exceeding a norm; or (d) presence of an ingredient in high proportion. In compound words, join *super-* with another word without using a space or hyphen: *supercharge, superconductivity, superfluid, superheat.* However, use a hyphen if the second element is capitalized: *super-Fahrenheit.* See **prefixes** and **hyphen, dash**.

supra- Prefix that indicates (a) above, higher, or transcending; (b) greater than; or (c) preceding, prior to. In compound words, join *supra-* with other words without using a space or hyphen: *supraliminal, supramolecular*. However, use a hyphen if the second element is capitalized: *supra-*. Do not confuse with *super-* (see **super-**). See **prefixes** and **hyphen, dash**.

tagout (noun, adjective); tag out (verb).

technical monitor. An NRC headquarters project manager responsible for work performed and documents generated under a particular job code (see **job code**). This person reviews NUREG/CRs before they are published. See **NRC external report**.

tele- Prefix that indicates (a) distance, distant: *telesthesia*; (b) telegraph: *telegram*; or (c) television: *telecast*. In compound words, join *tele-* with another word without using a space or hyphen: *telephone*, *telecommunications*, *telecommute*, *teleoperated*. See **prefixes** and **hyphen**, **dash**.

temperature. 32°F, 97°C, 921 K, not 32 degrees F.

that/which. Use *that* to introduce a restrictive clause or phrase, one that is essential to a sentence's meaning: iNews *was the INL tabloid that contained feature articles about INL activities*.

Use *which* to introduce a nonrestrictive or parenthetical clause or phrase, one that is not essential to a sentence's basic meaning: *The INL's total quality program, which began in 1989, has changed the company's quality culture*. Note that commas set off the nonrestrictive or parenthetical clause.

thousand. The symbol used to represent one thousand is k: 15 kg (k is an abbreviation of kilo, which means thousand). In financial or budgetary documents, K is capitalized and used without a space between the number and the K: \$37K (this is an exception to the general rule of placing a space between a number and a symbol).

time. In text, generally spell out units of time: *38 hours, 12 minutes, 5 seconds, 1 year, 3 quarters*. Do not spell out numbers below 10: *8 months, 2 hours, 3-1/2 days*. It is *Monday morning at 7 o'clock* or *Monday at 7 a.m.* not *Monday morning at 7 a.m.* See UNITS OF MEASURE under **abbreviations** and FIGURES OR WORDS? under **numbers**.

titles. Follow these guidelines:

OF COMPOSITIONS: Craft meaningful, concise titles of compositions: *Environment and Infrastructure* of INL not INL Affected Environment: Supplemental Data Report in Support of the Preparation of the Surplus Plutonium Disposition Environmental Impact Statement.

Generally, capitalize and italicize titles of published works such as books, journals, magazines, newspapers, reports, plans, manuals, etc.:

The FY 2002–2006 Institutional Plan contains INL objectives, strategies, and initiatives. The team used Manual 14A—Safety and Health—Occupational Safety and Fire Protection. **Idaho National Laboratory**

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This includes short forms of the titles:

The Institutional Plan contains INL objectives, strategies, and initiatives.

The team's use of Manual *14A—Safety and Health* ensured the application of consistent safety policies.

There is a distinction between the short form of a title and its simple descriptive form, which need not be capitalized or italicized:

The plan provides....

The manual ensures....

Do not capitalize articles or prepositions unless they begin or end a title.

Generally, italicize titles of conferences, symposia, and workshops.

Do not italicize section headings or chapter titles of published works. Rather, place quotation marks around these headings or titles:

Section 4, "Organizational Responsibilities," in the *INL Packaging and Transportation Safety Manual.*

Also, do not italicize titles of papers or articles. Instead, place quotation marks around these titles:

"Elimination of p-Chlorophenol in Biofilm Reactor to Changes in Salt Concentration."

In addition, do not italicize titles of procedures, standards, lists, specifications, drawings, or forms managed by Document Control or Correspondence and Forms Control. Rather, place quotation marks around these titles, for example:

LWP-15006, "Radioactive Source Control"; STD-139, "INL Engineering Standards"; Drawing 410206, "RWMC Radioactive Waste Storage, 12,800-Lb Capacity, $2 \times 4 \times 8$ and $4 \times 4 \times 8$ ft, Plywood Box Assembly"; Form 320.01A, "Employee Phone Director Change Request."

Place quotation marks around titles of regulations, codes, laws, standards, and specifications issued by government entities and professional, scientific, and engineering organizations:

DOE O 5480.21, "Unreviewed Safety Questions"; DOE-STD-3009-94, "Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports"; 10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Wastes"; IDAPA 16.01.17, "Wastewater Land Application Permits"; ANSI/ANS 3.5-1981, "Nuclear Power Plant Simulators for Use in Operator Training"; IEEE 279-1971, "Criteria for Protection System for Nuclear Power Generating Station."

Do not italicize or place quotation marks around quasi-titles (see **quasi-**)—Record of Decision, Explanation of Significant Differences, Scope of Work, Statement of Work, Work Breakdown Structure, etc.—when they stand alone. However, italicize these titles when they are part of a full title: *Explanation* of Significant Differences for the Pit 9 Interim Action Record of Decision at the Radioactive Waste Management Complex.

Do not italicize acronyms or initialisms that stand for titles of published works:

Code of Federal Regulations (CFR).

OF PERSONS: In general, confine capitalization to formal titles used directly before a name: Vice President and Division Manager Ron H. Bryce, but Ron H. Bryce, vice president and division manager. See BUSINESS TITLES under **capitalization**.

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trademark. A trademark is a name, symbol, motto, or emblem identifying a particular product (*Kleenex, Kodak, Dr Pepper*), service/process (*Qwest, Fed Ex, Sanforized*), or firm (*Microsoft, IBM*). Trademarks of services or processes may be called service marks. Trademarks registered with the U.S. Patent and Trademark Office carry the symbol ®.

Capitalize trademarks. On first use, include the generic term after the trademark: *Kleenex tissue, Kodak camera*. A trademark is an adjective not a noun. Therefore, it should not be made plural. Instead, make the common noun it describes plural: *Kleenex tissues, Kodak cameras*.

A trademark should not be used as a verb. It is correct to say, *Make six copies on the Xerox copier*; but it is incorrect to say, *Xerox the report*. A trademark should never be used in the possessive ('s) form unless the 's is part of the trademark: *Levi's jeans*.

A trademark may be indicated in a footnote (see **footnote**): Trademark of Microsoft Corporation.

The symbol of a trademark or service mark ($^{\text{TM}}$ or $^{\text{SM}}$) often accompanies a trademark or service mark that is not registered with the U.S. Patent and Trademark Office: Windows $^{^{\text{TM}}}$. These marks are generally used in presentations created by institutions that own the trademark; it is unnecessary to include this symbol or the registered symbol (\mathbb{R}) in technical writing.

The first time a trademark appears in a document that does not contain the legal disclaimer inside the cover (see **cover**), include a product disclaimer. This disclaimer need be included only once to cover all trademarks mentioned in the document.

trans- Prefix that indicates (a) across or over, (b) beyond or above, (c) from one place to another, (d) transferring or transporting, (e) changing, or (f) having a greater atomic number (see **atomic number**). In most cases, form compound words from *trans-* without using a space or hyphen: *transcontinental, transmembrane.* However, use a hyphen if the second element is capitalized: *trans-Canada.* Refer first to this guide, then to the most recent edition of *The American Heritage Dictionary, Webster's Fourth New International Dictionary,* or the *Government Printing Office Style Manual* for specific word compounding. See **prefixes** and the **hyphen, dash**.

ultra- Prefix that indicates (a) beyond a specified limit, range, or scope; (b) exceeding what is common, moderate, or proper; or (c) extreme degree. In compound words, join *ultra-* with another word without using a space or hyphen: *ultrasonic, ultraconservative, ultramicrometer*. However, use a hyphen if the second element is capitalized: *ultra-British*. See **prefixes** and **hyphen, dash**.

un- Prefix that indicates (a) not or contrary to, (b) reversal of an action, (c) deprivation, or (d) release, remove. In compound words, join *un*- with another word without using a space or hyphen: *unaccomplished, unappropriated, underprivileged, unscrew.* However, use a hyphen if the second element is capitalized: *un-American.* See **prefixes** and **hyphen, dash**.

under- Prefix that indicates (a) below, (b) inferior, (c) less than normal or proper, or (d) secrecy, treachery. In compound words, join *under-* with another word without using a space or hyphen: *underneath, underling, underpay, underworld.* Note, however, that *under* may combine with other words as a unit modifier, in which case all the words are hyphenated: *an under-the-table deal.* See **prefixes** and **hyphen, dash**.

units of measure. Approved units of measure are primarily from the International System of Units (SI) (see **SI**) and the U.S. Customary and British Imperial Systems. For a list of approved common units, see Appendix C, "Units of Measure, Chemical Symbols, and Miscellaneous Abbreviations."

See measures and UNITS OF MEASURE under abbreviations.

user's guide (singular) Not users' guide or user guide.

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user's manual (singular) Not users' manual or user manual.

utilize. *Utilize* is not synonymous with *use. Utilize* specifically refers to using something for a novel purpose: crews utilize the equipment truck as a changeroom but crews use the equipment truck to transport equipment. Avoid overusing utilize, which can be pretentious.

walk-down (noun, adjective); walk down (verb)

Washington, D.C. But *Washington*, *DC* in an address.

when. Restrict use to discussions of time, rather than situations or conditions. Not *mixed waste is when* you have both a radioactive and a hazardous (toxic chemical) element in the waste, but mixed waste is material contaminated by both a radioactive and a hazardous (toxic chemical) element.

where. Restrict use to discussions of location, rather than situations or conditions. Not *mixed waste is* where you have both a radioactive and a hazardous (toxic chemical) element in the waste, but mixed waste is material contaminated by both a radioactive and a hazardous (toxic chemical) element.

whole-body counter

who/whoever, whom/whomever. An easy way to determine if you have selected the correct pronoun is to replace it with *he, she, they* (nominative pronouns), or *him, her, them* (objective pronouns). If *he, she,* or *they* fits, *who/whoever* is the right choice. If *him, her,* or *them* fits, *whom/whomever* is correct. Consider these examples:

Who will start work today? (Replace *who* with a different pronoun: *She* will start work today. *Who* is correct.)

For whom did you say you work? (Replace *whom* with a different pronoun: You work for *him. Whom* is correct.)

INL is an economic boon to whoever lives in Idaho. (Replace *whoever* with a different pronoun: INL is an economic boon to *her*. *Whoever* is incorrect.)

An open door policy allows employees to discuss their concerns with whomever they wish. (Replace whomever with a different pronoun: They feel a need to discuss their concerns with them. Whomever is correct.)

DETAILS: *Who* and *whoever* are nominative (or subjective) pronouns, which means they refer to subjects of sentences or clauses. For instance: *Who will be there? Don Ofte, who retired December 31, managed DOE-ID for 2-1/2 years. Whoever participates will learn the process.*

Whom and whomever are objective cases of who and whoever, which means that they refer to objects of prepositions or verbs: You work for whom? Mr. Shipp praised whom? The company decided to accept work contracts from whomever.

When an entire clause, introduced by *who/whoever* or *whom/whomever*, serves as the object of a preposition or verb, correct use of *who/whoever* or *whom/whomever* depends on how the pronoun is used in the clause. For example, in the sentence, *Successful research requires the best efforts of whoever is involved*, the words *whoever is involved* constitute an objective clause, with *whoever* as the subject of the clause. *Whoever* is therefore the correct pronoun.

Whomever is the correct pronoun if it serves as the object of an objective clause. For example: Members of the research team praised whomever they certified. Whomever they certified is a clause that serves as the object of the verb praised. Within the clause, whomever is the object of the verb certified. Whomever is therefore correct. Use of who/whoever and whom/whomever in a clause always depends on how the pronoun is used in the clause.

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-wide. Suffix meaning extended over a specific region. Generally, do not hyphenate (e.g., *nationwide, companywide*) unless used with acronyms, double letters, or proper nouns: *INL-wide, burrow-wide, Site-wide*. Refer first to this manual, then to the most recent edition of <u>The American Heritage Dictionary</u>, Webster's Fourth New International Dictionary, or the Government Printing Office Style Manual for specific word compounding. See suffixes.

x-ray.

year-end (noun, adjective)

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Appendix B

References

A reference list is arranged alphabetically (except in a numbered reference system) and should generally not be divided into sections. Types of sources that are not readily adapted to authordate style are often better cited in notes. All sources are listed by the last names of the authors (or, if no author or editor is given, by the title or, failing that, a descriptive phrase). (See Chicago Manual of Style for more examples.)

Book

Grazer, Brian, and Charles Fishman. 2015. *A Curious Mind: The Secret to a Bigger Life*. New York: Simon & Schuster.

Chapter of an Edited Book

In the reference list, include the page range for the chapter or part. In the text, cite specific pages.

Thoreau, Henry David. 2016. "Walking." In The Making of the American Essay, edited by John D'Agata, 167–95. Minneapolis: Graywolf Press.

E-book

NOTE: For books consulted online, include a URL or the name of the database in the reference list entry. For other types of e-books, name the format. If no fixed page numbers are available, cite a section title or a chapter or other number in the text, if any (or simply omit).

Austen, Jane. 2007. Pride and Prejudice. New York: Penguin Classics. Kindle.

- Borel, Brooke. 2016. The Chicago Guide to Fact-Checking. Chicago: University of Chicago Press. ProQuest Ebrary.
- Kurland, Philip B., and Ralph Lerner, eds. 1987. The Founders' Constitution. Chicago: University of Chicago Press. http://press-pubs.uchicago.edu/founders/.
- Melville, Herman. 1851. Moby-Dick; or, The Whale. New York: Harper & Brothers. http://mel.hofstra.edu/moby-dick-the-whale-proofs.html.

Journal Article

In the reference list, include the page range for the whole article. In the text, cite specific page numbers. For articles consulted online, include a URL or the name of the database in the reference list entry. Many journal articles list a DOI (Digital Object Identifier). A DOI forms a permanent URL that begins https://doi.org/. This URL is preferable to the URL that appears in your browser's address bar.

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- Keng, Shao-Hsun, Chun-Hung Lin, and Peter F. Orazem. 2017. "Expanding College Access in Taiwan, 1978–2014: Effects on Graduate Quality and Income Inequality." Journal of Human Capital 11, no. 1 (Spring): 1–34. https://doi.org/10.1086/690235.
- LaSalle, Peter. 2017. "Conundrum: A Story about Reading." New England Review 38 (1): 95–109. Project MUSE.
- Satterfield, Susan. 2016. "Livy and the Pax Deum." Classical Philology 111, no. 2 (April): 165–76.
- Bay, Rachael A., et al. 2017. "Predicting Responses to Contemporary Environmental Change Using Evolutionary Response Architectures." American Naturalist 189, no. 5 (May): 463–73. https://doi.org/10.1086/691233.

News or Magazine Article

Articles from newspapers or news sites, magazines, blogs, and the like are cited similarly. In the reference list, it can be helpful to repeat the year with sources that are cited also by month and day. Page numbers, if any, can be cited in the text but are omitted from a reference list entry. If you consulted the article online, include a URL or the name of the database.

- Manjoo, Farhad. 2017. "Snap Makes a Bet on the Cultural Supremacy of the Camera." New York Times, March 8, 2017. https://www.nytimes.com/2017/03/08/technology/snap-makes-a-bet-on-the-cultural-supremacy-of-the-camera.html.
- Mead, Rebecca. 2017. "The Prophet of Dystopia." New Yorker, April 17, 2017.
- Pai, Tanya. 2017. "The Squishy, Sugary History of Peeps." Vox, April 11, 2017. http://www.vox.com/culture/2017/4/11/15209084/peeps-easter.
- Pegoraro, Rob. 2007. "Apple's iPhone is Sleek, Smart and Simple." Washington Post, July 5, 2007. LexisNexis Academic.

Thesis or Dissertation

Rutz, Cynthia Lillian. 2013. "King Lear and Its Folktale Analogues." Ph.D. diss., University of Chicago.

Report

Jensen, Will. 2015. "Idaho National Laboratory FY15 Economic Summary Research and Development." INL/MIS-15-37385, Idaho National Laboratory.

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Website Content

It is often sufficient simply to describe web pages and other website content in the text ("As of May 1, 2017, Yale's home page listed..."). If a more formal citation is needed, it may be styled like the examples below. For a source that does not list a date of publication or revision, use n.d. (for "no date") in place of the year and include an access date.

- Bouman, Katie. 2016. "How to Take a Picture of a Black Hole." Filmed November 2016 at TEDxBeaconStreet, Brookline, MA. Video, 12:51. https://www.ted.com/talks/katie bouman what does a black hole look like.
- Google. 2017. "Privacy Policy." Privacy & Terms. Last modified April 17, 2017. https://www.google.com/policies/privacy/.

Yale University. n.d. "About Yale: Yale Facts." Accessed May 1, 2017. https://www.yale.edu/about-yale/yale-facts.

Appendix C

Units of Measure, Symbols, and Abbreviations

Four Guidelines for Using Measurements in Scientific Writing for Idaho National Laboratory

- 1. Prefer standard units to imperial units in most scientific writing. Procedure writing is often an exception to this rule because imperial units remain more familiar and more easily estimated by performers of procedures. However, INL has a longstanding preference for rads and Roentgens over Sieverts and Grays.
- 2. Choose either standard units or imperial units, then use the chosen form consistently. It is almost never necessary to restate the measurement in the other form (i.e., Measurements were taken at 2 in. [5.08 cm] intervals). Conversions are easily performed in the computer age.
- 3. Neither standard units nor imperial units, when abbreviated, require a final s to indicate the plural. With the exception of inch and inches, INL style is not to use a period with an abbreviated unit. Inch and inches are abbreviated in., following with a period, to avoid confusion with the word in used as a familiar preposition.
- 4. The degree symbol (°) is used to refer to temperature, and not in the measurement of angles, latitude, or longitude. It is used, per INL style, for degrees Fahrenheit or Celsius, but not with measurements in kelvin. When the degree symbol is used, the number, degree symbol, and unit (i.e., F or C) appear without spaces. For temperatures in kelvin, separate the number and the symbol K with a space (250°C, but 600 K).

Terms	Abbreviation or Symbol	Terms	Abbreviation or Symbol
absolute ampere	abamp	ampere-hour	$\mathbf{A} \cdot \mathbf{h}$
acidity [or alkalinity]	pН	ampere-turn	A-turn
acre	acre	angstrom (10^{-10} m)	Å
acre-feet	acre · ft	antilogarithm	log ⁻¹ , antilog
actinium	Ac	antimony	Sb
actual cubic feet per minute	ACFM	aperture (f-stop)	f(italicized: e.g.,
alternating current	ac		<i>f</i> /16)
altitude	alt	approximate (in subscript)	approx
aluminum	Al	approximately equal to	≈
amagat	amagat	argon	Ar
americium	Am	arsenic	As
amperage	AMP	astatine	At
ampere	А	atmosphere, standard	As

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Terms	Abbreviation or Symbol	Terms	Abbreviation or Symbol
atmosphere (unit)	atm	candlepower	ср
atomic mass units	amu	capacitance	С
atomic number	at. no. [or Z]	carbon	С
atomic units	a.u.	Celsius	°C
atomic weight	at. wt	center line	cL
atto- (10^{-18})	а	center of mass	c.m.
audio-frequency	af	centi- (10^{-2})	c
average (in subscript)	av	centimeter	cm
avoirdupois	avdp	centimeter-gram-second	cgs
azimuth	az	centimeters per second	cm/s
		centipoise	cP
bar	bar	cerium	Ce
$barn(10^{-24} \text{ cm}^2)$	b	cesium	Cs
barometer	bar.	characters per inch	cpi
barrel	bbl	characters per second	cps
Baumé	Bé	chlorine	Cl
Becquerel (disintegration/s)	Bq	chromium	Cr
berkelium	Bk	circa	ca
berium	Ba	cobalt	Со
beryllium	Be	coefficient (in subscript)	coef
billion cubic feet	bcf	cologarithm	colog
billion electron volts	GeV [or BeV]	concentrated or concentration	conc
biot	Bi	conductivity	σ [or cond]
bismuth	Bi	constant	const
bits per second	b/s	contact potential difference	cpd
body-centered-cubic	bcc	continuous-wave	cw
boiling point	bp	copper	Cu
boron	В	cord	cd
brake horsepower	bhp	cosecant (hyperbolic)	csch
Brinell hardness number	Bhn	cosecant (trigonometric)	csc
British thermal unit	Btu	cosine (hyperbolic)	cosh
British thermal unit per hour	Btu/h	cosine (trigonometric)	cos
British thermal unit per foot per	Btu \cdot ft/(h \cdot ft ² \cdot	cotangent (hyperbolic)	coth
hour per foot squared per degree	F)	cotangent (trigonometric)	cot
have a series and the series of the series o	D.	coversed sine (trigonometric)	covers
	Br	counts per minute	counts/min
	Ca	counts per second	counts/s
calculated (in subserint)		cubic	cu [or superscript
calculated (in subscript)	calc		3]
calloria (gram calcric)		cubic centimeter	cm ³
calorie (gram calorie)	cal	cubic foot	ft ³
candela	cd	cubic feet per minute	ft ³ /min

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Terms	Abbreviation or Symbol	Terms	Abbreviation or Symbol
cubic feet per second	ft ³ /s	dots per inch	dpi
cubic inch	in. ³	dozen	doz
cubic meter	m ³	dyne	dyn
cubic micron	μ ³	dysprosium	Dy
cubic millimeter	mm ³		-
cubic yard	yd ³	effective dose equivalent	$H_{\rm E}$
curie	Ci	effective forced outage hour	EFOH
curies per minute	Ci/min	effective full-power day	EFPD
curies per second	Ci/s	effective full-power month	EFPM
curium	Cm	effective full-power year	EFPY
cycles per second (hertz)	Hz [or cps]	effective full-power hour	EFPH
cylinder	cyl	effective kilogram	Ekg
	-	einsteinium	Es
darcy (permeability unit)	D	electromagnetic force	emf
day	d (spell out in	electromagnetic units	emu
	text)	electromotive force	emf
debye	D	electron spin resonance	ESR
$deci-(10^{-1})$	d	electron volt	eV
decibel	dB	electrostatic units	esu
decimeter	dm	entropy units	eu
degree (angle)	degree	equivalent	equiv
degrees Baumé	°B	equivalent full-power hour	EFPH
degrees Celsius (centigrade)	°C	erbium	Er
degrees Fahrenheit	°F	erg	erg
degrees Kelvin (absolute)	K (no degree	erg-second	erg · s
	sign)	error function	erf
degrees Rankine (absolute)	°R	error function complement	erfc
degrees Reaumur	R (no degree	europium	Eu
data (10)	sign) da	exa- (1018)	Е
denaity	ua	experiment(al) (in subscript)	expt
denisity	ρ dominus	exponential	exp [or e
deuterium	D		italicized]
deuterium	D	exponential integral	Ei
diameter	u dia		
diamond puremid hardness		face-centered-cubic	fcc
diamond pyramid nardness	DPTT	farad	F
disintegration	dia	Fahrenheit	°F
disintegrations per minute	dnm	feet (foot)	ft
disintegrations per minute	dps	feet per day	ft/d
disnlegaments per second	dpa	feet per minute	ft/min
dollar (reactivity)	upa $(a = 15 \circ)$	feet per second	ft/s
donar (reactivity)	\$ (e.g., 15 \$)	femto- (10^{-15})	f

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Terms	Abbreviation or Symbol	Terms	Abbreviation or Symbol
femtometer (10 ⁻¹⁵ m)	fm	gram-calorie	cal
fermi (10 ⁻¹³ cm)	F	gram–molecular volume	gmv
fermium	Fm	grams per cubic centimeter	g/cm ³
fluorine	F	grams per liter	g/L
foot (feet)	ft	gravity, acceleration of	g
footcandle	fc	gray (J/kg absorbed dose)	Gy
foot-lambert	fL		-
foot-pound	ft · lb	hafnium	Hf
formal (chemical solutions; with number only, e.g., 0.5F)	F (italicized)	hartree hectare (104 m^2)	hartree ha
francium	Fr	hecto- (102)	h
franklin	Fr	height of equivalent theoretical	HETSHTU
freezing point	fp	stage height of transfer unit	ILLIGHTO
frequency	freq	helium	Не
frequency, high	hf	henry (Wb/A)	Н
low	lf	hertz (cycles/s)	Hz
medium	mf	hexagonal-close-packed	hcp
superhigh	SHF	high frequency	hf
ultrahigh	UHF	high voltage	hv
very high	VHF	holmium	Но
very low	vlf	horsepower	hp
video	vdf	horsepower hour	hph
full width at half–maximum	FWHM	hour	h [or hr], (may
fusion point	fnp		spell out in text)
		hydrogen	Н
gadolinium	Gd	hydrogen ion concentration,	pН
gallium	Ga	negative logarithm	
gallon	gal	hyperbolic cosecant	csch
gallons per hour	gph	hyperbolic cosine	cosh
gallons per minute	gpm	hyperbolic cotangent	coth
gauss	G	hyperbolic sine	sinh
Geiger-Mueller [or Müller]	GM	hyperbolic tangent	tann
germanium	Ge	hyperfine structure	hfs
gibbs	gibbs		T ()
giga- (109)	G	imaginary part (of x)	$\lim_{x \to \infty} (x)$
gigahertz	GHz	inch	in.
giga-electron-volt	GeV	inches of mercury	In. Hg
giga-Watt days per metric ton of	GWD/MTU	inches of water	In. H_2O
uranium		inches per minute	ipm
gilbert	Gi	inches per second	ips
gold	Au	inches water gauge	IWg
gram	g	indicated horsepower	ıhp

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inlet cubic feet per minute icfm in . Ib kilojoule kj	Terms	Abbreviation or Symbol	Terms	Abbreviation or Symbol
inch-poundin. · IbkiloliterkL.indiumInkiloliterkminductanceL (italicized)kilo-orstedkOeinductance-capacitanceLC (italicized)kilo-orstedkMoinfaredIRkiloon (nuclear explosive yield)Ktintegrated neutron fluxnvtkiloton (nuclear explosive yield)Ktintermaticatistancespelled outkilovoltkVAintermaticatistancespelled outkilovatt-hourkW · hintrameuscularimkilovatt-hourkW · hintraperionealipkilowardkwiodineIkinetickiniridiumIrkinetic energyKE or TironFekinetic energyKENNjerk (GJ)jerkkip (1,000-lb unit of deadweight)kipstayserKlaboratory (system) (in subscript)labkilobarkbarlaithanumLakilobarkaalaithanumLakilobarkaalaithanumLakilobarkaalaithanumLakiloocalorie per secondkcilititLititkilocalorie per secondkc/slaithiamLititkilocalorie per secondkc/slogarithm, saw of naturale (italicized)kilogram-meterkg' mlititiumLititiumLititiumkilogram (dry weight)kg' mlogarithm, naturalla (italicized)kilogram-meterkg' mmanesiumma	inlet cubic feet per minute	icfm	kilojoule	kj
indiumInkilometerkminductanceL (italicized)kilo-oerstedk0einductance-capacitanceLC (italicized)kilometers per secondkm/sinfarredIRkilometers per secondkm/sintegrated neutron fluxnvtkilooln (nuclear explosive yield)Ktintermediate frequencyi.f.kilovoltkVAintermational angstromIAkilovolt-amperekVAintramuscularimkilovolt-amperekWintraperitonealipkilowatdkWiridiumIrkinetickineticironFekilovolt-ampereKE or TironFekinetickineticironFekilovolt-ampereKHNironjerkkinetickineticjoule (N · m)Jkinetickinetickilo-(10 ²)klaboratory (system) (in subscript)labkilobarkbarlatitudelatitudekilobarkealleadPbkilocaloriekcalleadPbkilocaloriekcallogarithm, base of naturale (italicized)kilocaloriekcallogarithm, commonlogkilogram (kry weight)kglutertiumLukilogram merekg · mlutertiumlatikikiloingramkilogram merekg · mlutertiumlatikikiloingramkilogram merekg · mlutertiumlatikiloingramkilogram merekg · m	inch-pound	in. · lb	kiloliter	kL
inductance L (italicized)iklo-oerstedkOeinductance-capacitance LC (italicized)kilometers per secondkm/sinfraredIRkilopascalkPaintegrated neutron fluxnvtkilovoltkVinternatizersistancespelled outkilovoltkVAinternational angstromIÅkilovoltkWintramuscularimkilovordkwiodineIkilovordkwiodineIkinetickinovirridumIrkinetickinovirridumIrkinetickinovirridumIrkineticKHNjoule (N · m)Jkinovart.hourKHNkilobarKlambertLkilobarkbarlattinudelattinudekilobarkbarlattinudelattinudekilobarickcallattinudeLwkilocalorie per second (kiloherz)kHZlinerkilocalorie per second (kiloherz)kHZlinerkilocalorie kilogramkc3logarithm, base of naturale (tialicized)kilogram (hry weight)kg · mkglinerLukilogram (hry weight)kg · mlattinumLukilogram (hry weight)kg · mlattinumLukilogram (hry weight)kg · mmagnetion (hry m ²)linerkilogram (hry weight)kg · mmagnetion (hry m ²)linerkilogram (hry weight)kg · mmagnetion (hry m	indium	In	kilometer	km
inductance-capacitance LC (italicized)ikilometers per secondkm/sinfraredIRkilopascalkPaintegrated neutron fluxnvtkiloton (nuclear explosive yield)Ktintermediate frequencyi.f.kilovolt-amperekVAinternational angstromIAkilowatt-hourkW \cdot hintramuscularimkilowatt-hourkW \cdot hintramuscularipkilowatt-hourkW \cdot hintramuscularipkilowatt-hourkilointramuscularipkilowatt-hourkilointroipkilowatt-hourkilokinoipipkilowatt-hour <td>inductance</td> <td>L (italicized)</td> <td>kilo-oersted</td> <td>kOe</td>	inductance	L (italicized)	kilo-oersted	kOe
infraredIRkilopascalkPaintegrated neutron fluxnvtkiloton (nuclear explosive yield)K1international angstromI.Akilovolt -ampereKVAinternational angstromI.Akilowatt -hourkWintramuscularimkilowatt -hourkW · hintraperitonealipkilowordkWiodineIkinetic energyKE or TirronFekip (1,000-lb unit of deadweight)kip// for (GJ)jerk(microhardness)KHNjoule (N · m)JkryptonKrkayserKlaboratory (system) (in subscript)labkilobarkbarlaittudelatkilobarkbarlaittudelatkilobarkcalpercent)littudeLosookilobaries per second (kilohertz)KHzlittu<	inductance-capacitance	LC (italicized)	kilometers per second	km/s
integrated neutron fluxnvtnvtkiloton (nuclear explosive yield)Ktintermediate frequencyi.f.kilovoltkvinternational angstromIÅkilovolt-amperekVAintramuscularimkilowatt-hourkW · hintramuscularimkilowatt-hourkW · hintramuscularipkilowatt-hourkW · hintraperitonealipkilowatt-hourkW · hintraperitonealipkilowatt-hourkW · hintraperitonealipkilowatt-hourkWironIkinetickinetickinironjerkkip (1,000-lb unit of deadweightkipjoule (N · m)jerkkip (1,000-lb unit of deadweightkIPkayserKkkp (1,000-lb unit of deadweightkIPkilobarkkalaboratory (system) (in subscript)labkilobarkbarlatitudelatkilobarkBlatitudelatkilocaloriekcallethal dose (subscript denotesLDs0kilocycles per second (kilohertz)kHzlimitlimkilocycles per second (kilohertz)kGlogarithm, base of naturale (tatlicized)kilogramkglogarithm, commonloglogarithm, commonlogkilogram forcekgflutetiumLulutlutkilogram-weightkg · wtmagnetium forcemmf	infrared	IR	kilopascal	kPa
intermediate frequencyi.f.kilovoltkilovoltkVinternal resistancespelled outkilovolt-amperekVAinternational angstromIÅkilowattkWintramuscularimkilowordkWintramuscularipkilowordkwiodineIkilowordkwiodineIkilowordkwintramuscularipkilowordkwiodineIkinetickiniridiumIrkinetickiniridiumIrkinetickinopironFekip (1,000-lounit of deadweight)kipjerk (GJ)jerkKnop Hardness NumberKHNjoule (N · m)JkiptkiptkayserKlaboratory (system) (in subscript)labkiloo-(10 ⁵)klatitudelatkilobarkbarlatitudelatkilooloriekcalleadPbkilocalorie per molekcal/molelititr<	integrated neutron flux	nvt	kiloton (nuclear explosive yield)	Kt
internal resistancespelled outkilovolt-amperekVAinternational angstromIÅkilovattkWintramuscularimkilowattkWintraperitonealipkilowattkWintraperitonealipkilowordkmiodineIkinetickiniridiumIrkinetickiniridiumIrkinetickmironFekip (1,000-lb unit of deadweight)kipjerk (GJ)jerkkip (1,000-lb unit of deadweight)kipjoule (N · m)JkryptonKrkayserKlaboratory (system) (in subscript)labkalvof (10 ³)klambertLkilobarkbarlatitudelatkilobarkallawrenciumLwkilobariekcallethal dose (subscript denotesLDsokilobariekcal/molelititlititkilocaloriekcallethal dose (subscript denotesLDsokilocycles per second (kilohertz)kHzlititerLkilocycles per secondkc/slogarithm, naturaln [or log_]kilogram (dry weight)kgDlumen (cd · sr)lmkilogram meterkg · mlutetiumLukilogram weightkg · mlutetiumLukilogram weightkg · mlutetiumlutetiumkilogram weightkg · mmagnetomotive forcemmf	intermediate frequency	i.f.	kilovolt	kV
international angstromIÅkilowattkWintramuscularimkilowatt-hourkW · hintraperitonealipkilowatt-hourkW · hintraperitonealipkilowatt-hourkW · hindiumIrkinetickinirindiumIrkinetic energyKE or TirindiumFekip (1,000-lb unit of deadweight)kipjerk (GJ)jerkkinetic energyKHNjerk (GJ)jerkkryptonKrkayserKkryptonkrkelvinKlaboratory (system) (in subscript)labkilobarkbarlatitudelatkilobarkbarlatitudelatkilobarkcalleadPbkilobariekcallead subscript denotesLDs0kilobyrekBleadpercent)limitkilocaloriekcallimitlimitkilocycles per second (kilohertz)kHzlimitlimitkilogram (dry weight)kgDlogarithm, base of naturale (italicized)logarithm, commonloglogarithm, commonlogkilogram forcekgflumen (cd · sr)Imkilogram meterkg · mlutetiumLukilogram weightkg · mmagnetomotive forcemmf	internal resistance	spelled out	kilovolt-ampere	kVA
intramuscularimkilowatt-hourkW · hintraperitonealipkilowordkwiodineIkilowordkwiodineIkinetickiniridiumIrkinetickineticKIiridiumFekinetic energyKE or TironFekinopp Hardness NumberKHNjerk (GJ)jerk(microhardness)KHNjoule (N · m)JkryptonKrkayserKlaboratory (system) (in subscript)labkilobarkbarlatthanumLakilobarkbarlattitudelatkilobarkcallead energyDaskilocaloriekcallethal dose (subscript denotesDaskilocalorie s per molekcallitterLkilocycles per second (kilohertz)kHzlitthumLikilogram (dry weight)kgDlumen (cd · sr)lmkilogram meterkg · mlumen (cd · sr)lmkilogram meterkg · mlux (m/m²)kkilogram meterkg · mlux (m/m²)kkilogram meterkg · mmagnesiumMgkilogram weightkg · mmagnesiumMg	international angstrom	IÅ	kilowatt	kW
intraperitonealipkilowordkwiodineIkinetickiniodineIkinetickiniridiumIrkinetic energyKE or TironFekip (1,000-lb unit of deadweight)kipjerk (GJ)jerkkinctic energyKHNjoule (N · m)jerkkinctic energyKHNkayserKkipytonKrkayserKlaboratory (system) (in subscript)labkilobarkbarlanbertLkilobarkbarlaitudelatkilobaries per molekcalleadPbkilocalorie sper molekcal/molelititudlimkilocycles per second (kilohertz)kHzlititudlimkilogaramkgkGlogarithm, base of naturale(italicized)logarithm, commonloglogarithm, aturalln [or log_]kilogram (dry weight)kg/mlumen (cd · sr)lmkilogram-meterkg · mlutetiumLukilogram-meterkg · mlutetiumLukilogram (wet weight)kgWmagnesiumMgkilogram (wet weight)kgWmagnesiumMg	intramuscular	im	kilowatt-hour	$kW \cdot h$
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kilogram (wet weight) kgW magnetomotive force mmf	kilogram-weight	kg∙wt		
magnetomotive force mmf	kilogram (wet weight)	kgW	magnesium	Mg
kilograms per cubic meter kg/m ³	kilograms per cubic meter	kg/m ³	magnetomotive force	mmt
kilohm k Ω magnification X (e.g., 50X)	kilohm	kΩ	magnification	X (e.g., 50X)

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Terms	Abbreviation or Symbol	Terms	Abbreviation or Symbol
mass mean particle number	mmpd	microangstrom	μÅ
mass units	mu	microbar	μbar
maximum	max	microbarn	μb
maximum permissible	MPC	microcoulomb	μC
concentration		microcurie	μCi
maxwell	Mx	microfarad	μF
mean free path	mfp	microgram	μg
measured	meas	microhenry	μH
$mega-(10^{6})$	М	microliter	μL
megabar	Mbar	micromicrofarad	pF
megabit	Mb	micromole	μmol
megabyte	MB	micrometer	μm
megacurie	MCi	micron	μ
megacycles	Mc	microns per month	μ/mo
megacycles per second	MHz	micropascal	μPa
(megahertz)		microsecond	μs
megaelectron volts	MeV	microvolt	μV
megapascal	MPa	microwatt	μW
megavolt	MV	mil	mil
megavolt-ampere	MVA	mile	mi
megaton (nuclear explosive yield)	Mt	miles per hour	mph
megawatt	MW	$milli - (10^{-3})$	m
megawatt-day	MWd	milliampere	mA
megawatt electrical	MW(e)	milliangstrom	mÅ
megawatt-hour	$MW\cdot h$	millibar	mbar
megawatt-second	$MW \cdot s$	millibarn	mb
megawatt thermal	MW(t)	millicurie	mCi
megawatt-year	$MW\cdot y$	milliequivalent	meg
megohm	ΜΩ	millifarad	mF
melting point	mp	milligauss	mG
mendelevium	Md	milligram	mg
Mercalli intensity (seismology,	MI	milligrams per decimeter per day	mdd
earthquake intensity scale)		millihenry	mH
mercury	Hg	millilambert	mL
meter	m	milliliter	mL
meter-kilogram-second	mks	milli–mass units	mmu
meter-kilogram-second-ampere	mksa	millimeter	mm
metric ton of heavy metal	MTHM	millimeter of mercury	mm
metric ton of uranium	MTU	millimicrofarad	nF
mho	mho	millimicron	mu
micro– (10^{-6})	μ	millimicrosecond (nanosecond)	mus
microampere	μΑ	millimole	mmol

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Terms	Abbreviation or Symbol	Terms	Abbreviation or Symbol
million	M	neon	Ne
million barrels of oil per day	mbopd	neper (napier)	Np
million bits per second	mbps	neptunium	Np
million gallons per day	mgd	net counts per minute (total counts	ncpm
million instructions per second	mips	per minute minus background)	-
million electron volts	MeV	neutrons per square centimeter per	$n/cm^2 \cdot sN$
million vehicle miles	mvm	second newton	(F)
million volts	MV	neutrons per second	n/s [or nps]
milliradian	mrad	neutrons \times velocity \times time	nvt (v italicized)
millirem	mrem	neutrons per volume time	nvt
millirem per hour	mrem/h	neutrons per square centimeter per second	$n/cm^2 \cdot s$
milliroentgen	mR	newton (kg \cdot m/s ²)	Ν
milliroentgen per hour	mR/h	nickel	Ni
millisecond	ms	niohium	Nh
millivolt	mV	nitrogen	N
milliwatt	mW	nobelium	No
minimum	min	normal (chemical solutions)	N (italicized)
minute (angular measure)	'	nuclear reactivity (effective	k _{eff}
minute (time)	min (spell out in text)	multiplication factor)	iten i
modified Mercalli intensity	MMI	nuclear magneton	μ_N [or nm]
(seismology)		nucleon	N
molal	molal		
molar	<u>M</u>	oersted	Oe
mole	mol [or spell out]	ohm (V/A)	Ω
mole percent	mol%, mole%	optical density	OD
molecular weight	mol wt	osmium	Os
molybdenum	Мо	ounce	0Z
month	mo (or spell out in text)	oxygen	0
multiplication factor for an infinite	k∞	palladium	Pd
body of material		parsec	pc
		parts per billion	ppb
nano- (10-9)	n	parts per million	ppm
nanocurie	nCi	parts per million by volume	ppmv
nanograms per second	ng/s	pascal (N/m ²)	Pa
neutrons per grams per second	ngs	$peta-(10^{15})$	Р
nanometer	nm	phosphorus	Р
nanosecond	ns	photomultiplier tube	PM
natural logarithm	ln [or log _e]	$pico-(10^{-12})$	Р
nautical mile	nm	picocurie	pCi
neodymium	Nd	picofarad	pF

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Terms	Abbreviation or Symbol	Terms	Abbreviation or Symbol
picosecond	ps	range	R
pint	pt	Rankine (degree)	°R
platinum	Pt	real part (of x)	$\operatorname{Re}(x)$
plutonium	Pu	reciprocal ohm (siemens)	S [or mho]
poise	Р	rem per hour	rem/h
polonium	Ро	roentgen per hour	R/h
potassium	Κ	roentgen per minute	R/min
potassium iodide	KI	resistance	R (italicized)
potential energy	PE [or V italicized]	revolutions per minute	rpm rns
pound(s)	lb	rhenium	Re
pound-force	lbf	rhodium	Rb
pounds mass	lbm	roentgen	R
pounds per brake horsepower-hour	lb/bhp-h	roentgen equivalent man	rem
pounds per cubic foot	lb/ft ³	roentgen equivalent, man	ren
pounds per square foot	lb/ft ²	rubidium	Rh
pounds per square inch	psi	ruthenium	Ru
pounds per square inch, absolute	psia	rydberg	Rv
pounds per square inch, differential	psid	lydoorg	ity
pounds per square inch, gauge	psig	samarium	Sm
power factor	pf	scandium	Sc
praseodymium	Pr	secant (hyperbolic)	sech
precipitation hardenable	РН	secant (trigonometric)	sec
pressure (millimeter of mercury)	mmHg	second, angular measure	"
probable error	pe	second time	s [or sec] (spell
promethium	Pm		out in text)
proportional to (or varies as)	x	selenium	Se
protactinium	Ра	shake (10 ⁻⁸ s)	sh
protium (ordinary hydrogen	Н	siemens (A/V)	S
isotope)		sievert	J/kg [or Sv]
proton	р	silicon	Si
pulses per second	pps	silver	Ag
		similar	~
quadrillion Btu per year	Q	sine (hyperbolic)	sinh
quart	qt	sine (trigonometric)	sin
		sodium	Na
radian	rad	speed of light	c (italicized)
radiation absorbed dose	rad	square	superscript ² [or
radio-frequency	rf		sq]
radium	Ra	square centimeter	cm ²
radius	r	square foot	ft ²
radon	Rn	square inch	in. ²

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Terms	Abbreviation or Symbol	Terms	Abbreviation or Symbol
square kilometer	km ²	tonne (metric ton, 10 ³ kg)	t, [or Mg
square meter	m ²		(megagram)]
square micron	μ^2	torr	Torr
square micrometer	μm^2	trace	Tr
square millimeter	mm ²	transpose	tr
standard cubic feet	scf	tritium	Т
standard cubic feet per hour	scfh	triton	t
standard cubic feet per minute	scfm	tungsten	W
standard cubic feet per second	scfs		
standard deviation	σ	ultimate strength	us
steradian	Sr	ultimate tensile strength	uts
stokes	St	ultrahigh frequency	UHF
strontium	Sr	ultrahigh frequency-very high	UHF-VHF
sulfur	S	uranium	U
tangent (hyperbolic)	tanh	1.	
tangent (trigonometric)	tan	vanadium	V
tantalum	Та	velocity	v (italicized)
technetium	Tc	versed sine (trigonometric)	vers
tellurium	Те	very high frequency	VHF
temperature	temp. [or T	volt (W/A)	V
	italicized]	volts alternating current	Vac
tensile strength	ts	volts direct current	Vdc
tensile yield strength	tys	volt–ampere	VA
tera– (10^{12})	Т	volts per meter	V/m
terajoule	TJ	volume	vol
terawatt	TW	volume parts per million	vpm
terbium	Tb	volume percent	vol%
tesla (Wb/m ²)	Т		
thallium	Tl	water equivalent	w.e.
thorium	Th	watt (J/s)	W
thousand	k	watt-hour	$W \cdot h$
thousand electron volts	keV	watt-second	$W \cdot s$
thousand pounds per square inch	kpsi	weber $(V \cdot s)$	Wb
thulium	Tm	week	wk
time	t (italicized)	weight	wt
time-integrated neutron flux (or neutron fluence)	nvt	weight percent	wt%
tin	Sn	xenon	Xe
titanium	Ti	x units	xu
ton	ton		

zirconium

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Terms	Abbreviation or Symbol			
yard	yd			
year	y [or yr] (spell out in text)			
yield strength	ys			
yield tensile strength	yts			
ytterbium	Yb			
yttrium	Y			
zinc	Zn			

Zr