



شركة نفط البحرين (مقفلة)
THE BAHRAIN PETROLEUM COMPANY B.S.C. (CLOSED)

TECHNICAL WRITING

STYLE GUIDE

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CONTENTS

	<u>Page</u>
Contents	i
1.0 Introduction	1
2.0 What is Style and Why Is It Important?	3
3.0 Overall Appearance and Physical Layout	4
3.1 Page Layout	5
3.2 Font Type and Size	6
3.3 Text Alignment and Word Spacing	8
3.4 Section Indentation and Numbering	9
3.5 Headings, Bold and Underline	10
4.0 Tables in the Text	11
5.0 Numbering, Bullets and Lists	12
6.0 Writing Style	14
6.1 Language and Expression	14
a. Active or Passive Voice	14
b. Word Selection	15
c. Spelling	17
d. Punctuation	17
e. Grammar	18
f. Pedantry	18
6.2 Sentence Length	18
6.3 Numbers in the Text	19
6.4 Dates	19
6.5 Abbreviations	20
6.6 References in the Text and Lists	20
6.7 Brackets	21
6.8 Dashes	22
6.9 Page Numbering	22
6.10 Other Guidelines	23
7.0 Emails at Work ('Engineering Emails')	25
7.1 Introduction	25
7.2 Main Governing Points	25
7.3 Email Etiquette and Conventions	27

CONTENTS (cont'd)

	<u>Page</u>
8.0 Other Requirements, Conventions and Guidelines	30
8.1 The First Page	30
8.2 The Signature Page	30
8.3 Attachments	30
8.4 Distribution Lists	30
8.5 Electronic File Names and Filing	31
9.0 References	33

1.0 INTRODUCTION

“Engineers are rarely criticised for lack of knowledge of thermodynamics, mass transfer or mathematics. They are, however, often criticised for their inability to write clear, concise and correct English. It is tragic to find engineers who are technically competent but unable to demonstrate this competence to others. The advancement of their careers and the achievement of personal satisfaction from their jobs, depend on their ability to communicate ideas and findings successfully to colleagues and to the public.”¹³

In our profession, the importance of good communications skills, especially in written communication, cannot be over-emphasised. Good technical writing is a must, to ensure that your message, ideas and recommendations are unequivocally understood by all readers.

You work hard all day, sweating under the hot sun to make field measurements and collect samples, analysing copious quantities of data and test results, evaluating unit performance, running simulations, reviewing historical records, solving the problems and creating new concepts. But all this effort is wasted if the resulting written communication fails to deliver the right message in the right manner. At best a poor writing style distracts - perhaps even amuses - the reader; at worst it irritates and confuses the very people whom you wish to impress and convince. Busy decision-makers routinely have many documents of all types pass over their desks and have better things to do with their time than try to puzzle out unclear communications.

It’s a hard life. There may have been many reasons for your choosing a career in engineering. The opportunity to excel in written English is unlikely to have been one of them. But the fact remains that the ability to communicate in a clear and unambiguous manner lies at the heart of your job. It’s not a luxury but an operating necessity.⁷

Throughout your working life clear written communication will enable your technical expertise and hard work to shine through, helping you to achieve your ambitions. Within Bapco it will, at the very least, assist you in getting your point across. In your dealings with the outside world it will, quite simply, mark out the professionalism of the department and the company. In short, without the ability to communicate clearly in writing you are handicapping yourself at every level.

You may accept the truth of all this, but still find the thought of technical writing daunting and onerous, particularly if English is not your first language. Take comfort.

Firstly, if you have what it takes to be a competent process engineer, you have the ability to produce good technical writing. Such writing may not be easier, but it’s certainly not harder, than sound engineering work. Like engineering, good writing requires knowledge of the field, good planning, critical thinking and attention to detail. It’s unlikely to be perfect first time around and will require revision.¹¹ This is entirely normal.

Secondly, you are likely to have people around you who can help. If their writing skills and knowledge of the subject are greater than yours, that’s excellent. Show them your work and listen and learn from their observations. Supervisors, and those proficient in technical writing, have a duty to help their colleagues improve their writing skills; and you, in turn, should accept their constructive criticism as an opportunity to improve your skills. Moreover, just as you would have a colleague check your engineering calculations, so should you ask them to review your written work.

Thirdly, at the risk of sounding immodest, you now have this Technical Writing Style Guide. As process engineers, working in Technical Services, our only product is our written work and the same is also true for so many engineers of other disciplines. Therefore it’s surprising that style guides aimed specifically at engineers are something of a rarity. We hope we can at least start to rectify this state of affairs with this document. This is your guide to style, tailor-made to our

1.0 INTRODUCTION (cont'd)

environment and objectives, tested over time, the result of years of experience here at Bapco and elsewhere. It won't tell you how to produce great written work, but we hope it will show you how style, format and choice of language might assist your daily tasks – every one of them involving written communication – of generating ideas, developing concepts, ordering catalysts, solving problems or optimising the operation of a unit.

At this point, a note of caution is timely. Adopting the correct style for your written work is only part of the story and does not, by itself, ensure that the document meets the standards that we set for ourselves. Organisation of one's thinking, the structure of the text and the document, and the presentation of the logic and the technical arguments are also vital to success, and it is equally imperative that the content of the final document is accurate, consistent and unambiguous. All these aspects taken together make for the best document.

Finally, take the same pride in your technical writing as you would in developing a calculation, piping and instrument diagram, process flow diagram, drawing, sketch or a painting. With guidance and practice, technical writing should become second nature and in the long run it is efficient, powerful and satisfying.

2.0 WHAT IS STYLE and WHY IS IT IMPORTANT?

For the purpose of this document, the term style means the set of rules, conventions and guidelines which covers most aspects of the written work produced in Technical Services Department. It encompasses a diverse range of topics from overall document appearance and layout, to the choice of words and the way in which they are used and presented in the form of sentences, paragraphs, sections and subsections.

This style guide mainly concentrates on the way the document is presented and how it looks. This area is easy to get right for maximum effectiveness. The choice of words and sentence construction i.e. language and expression are also addressed, but in lesser detail. This is a more esoteric aspect of writing, but can be improved by reading, asking questions, taking advice from someone who has better writing skills and more experience and, most of all, practice, at work and outside.

No matter who receives your correspondence, the way it looks, the physical layout, its neatness, the structure and clear organization and presentation of ideas and sections, length of the sentences and the paragraphs, correctness of spelling, the choice of words and the style of writing, all show a professional attitude and respect for your reader. In addition to having a positive effect on the reader, you want your written work to reflect well on you the writer, your group and the department.^{4,5}

Overall, style is about passing on your message in a pleasant, clear and effective way.

3.0 OVERALL APPEARANCE AND PHYSICAL LAYOUT

Obviously the information in any document must be presented in a clear, logical and structured way, but how it looks is also vitally important. This is about making the reader's life easy or difficult. The reader should get the ideas with the greatest possible ease and not waste his energy fighting through your presentation.

The overall appearance and physical layout of your document has a major impact on how well it's received, read, understood and ultimately accepted. If the document doesn't look good, then there's a high risk that it will discourage, frustrate, amuse or even irritate the readers to such an extent that people will put off reading it for as long as possible.⁴ In addition, your work, your message, the conclusions and the recommendations will be poorly received and possibly unfairly judged or ignored, or even rejected outright.

There have been many articles and books written on the subject of improving technical writing. One of the important common themes is that attention must be paid to the presentation of the work. It's important to understand that the same material, better presented, can have a much higher impact and improve your success rate. Presentation can be enhanced in many simple ways, which are often ignored, to the detriment of the document and the writer. The more important steps which can be taken to improve appearance and readability are summarised below.

Features like double line spacing, generous margins, headings, subheadings and indentations, all help make a report look reader friendly. Numbering of sections, with a logical, consistent, sequence of major and minor numbers, also improves clarity.⁴ It is not the reader's job to decipher your document – it should not be a puzzle.

To make your report appealing to the eye and enhance readability, break your writing up into short sections. Pages that are crammed with text from margin to margin, and long, unbroken blocks of text are uninviting and intimidate and bore the reader. Moreover, fast reading is done with the eyes, and eyes cannot follow big blocks of text – they just slow down the reader. Breaking your writing up into short sections and short paragraphs, and using headings and subheadings, makes it easier to read.^{1c,5,6} Therefore be generous with white space.

Something as simple as a blank line between sections serves to open up the piece and make it less intimidating. Ten pages of solid text often seems like more of a chore than twelve pages with some extra white space thrown in for good measure.⁶

Include sufficient white space in your document by using wide margins and generous spacing between paragraphs and titles, headings and your main text. This will make your document more inviting and easier to follow. To check whether a document has sufficient white space, hold a page of text at arm's length and squint at it, so that it becomes blurred. If you see nothing but big blocks of text, more white space is required between the elements of text.³ Remember, that a document, when viewed from a distance, should be pleasant and balanced, just like a good painting is.

Modern word processing packages have a tremendous number of features which simply weren't available in the days of the typewriter and the first dedicated word processors. Although these features can be used to great advantage, many people fall into the trap of using a myriad of inappropriate features just because they're readily available. This can have disastrous effects on the document. The final document must still be well presented and readable. To use every gimmick and font available might be fun for the writer, but in most cases it will only irritate or confuse the reader. Given an appropriate font, plenty of paragraphs and enough white space, your document will convey its message as clearly as the words allow.^{1c}

3.0 OVERALL APPEARANCE AND PHYSICAL LAYOUT (cont'd)

The main factors which affect the appearance of the document are:

- ◆ Page Layout
 - Margins
 - Header – with page numbering, and possibly with file name and reference
- ◆ Font Selection
 - Font Type
 - Font Size
- ◆ Text Alignment and Word Spacing
- ◆ Indentation
- ◆ Paragraph spacing
- ◆ Use of bullets
- ◆ Use of the hard space i.e. CTRL-shift-space or hyphen

For maximum effectiveness and readability of your memoranda, reports, and email attachments, follow the rules given below. These are well established, tried and proven. Everyone has a different view but these work.

3.1 Page Layout

The rules for page layout are:

- ◆ Use A-4 paper size for all text documents – ensure that A-4 is selected in the ‘Page Setup’ and in the ‘Printer Properties’. Other paper sizes, especially ‘Legal’ will lead to margins which look ridiculous on A-4 paper.
- ◆ Margins should be as follows:
 - Left: 1 inch (2.54 cm)
 - Right: 1 inch (2.54 cm)
 - Top: 0.7 to 1 inch (1.78 to 2.54 cm), depending on what, if anything, is in the header – the aim is to ensure a ‘reasonable’ space between the top of the page or the last line in the header, and the first line of the main body of the text.
 - Bottom: 0.7 inch (1.78 cm)
- ◆ Headers and footers should be 0.5 inches (1.27 cm) inside the edges.
- ◆ If there is more than one page, then automatically number each page as ‘Page x of y’, in font size 9, at the top right hand corner of the header box. Use a right tab at the right margin to locate the text. Ensure that at least one blank line in the header separates the header text from the main body of the text.
- ◆ Try to avoid text in the footer box unless it has a special purpose e.g. copyright or confidentiality.
- ◆ Do not put page numbers in the footer.

In finalising the document, use page breaks to ensure that the layout is frozen and that unsightly gaps or empty pages do not appear.

3.0 OVERALL APPEARANCE AND PHYSICAL LAYOUT (cont'd)

3.2 Font Type and Size

The type and size of font selected for the text are extremely important to the overall appearance and readability of the document. Although there are a large number of fonts available in the word processing package, very few are suitable for the documents which TSD engineers produce.

The rules and guidelines for font type and size are presented below. However, in order to understand the rationale for these guidelines, a few definitions and explanations are required.

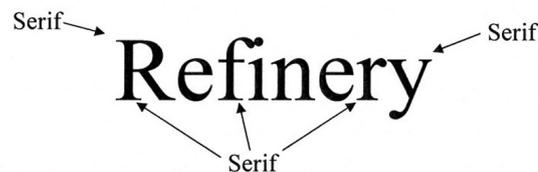
Fonts

In printing, publishing and word processing, a font is defined as a complete set of characters i.e. letters, figures, punctuation marks, and other symbols, which are available in a particular type face. A font family is a group of fonts with the same name e.g. Times.^{1d}

Roman is the upright form of type used for all general purposes. It contrasts with the sloping *italic* type.^{2c} Roman font is much easier to read and looks more pleasant. Avoid long runs of bold or italic font.^{1c}

Serif Fonts

A serif font is one that has short strokes called serifs, which cross the ends of the stems, arms and tails of the characters, as shown in the following example:^{1c}



The characters in a serif font look better than characters which do not have a serif i.e. sanserif characters, and they are thought to have a psychological benefit in promoting readability by drawing the reader's eye along a line of text.³ Most people agree that serif type is easier to read than sanserif fonts.^{2c}

Sanserif Fonts

Fonts which have characters without serifs are called sanserif. Sanserif faces such as Arial may appear to be neater or cleaner than serif faces such as Times New Roman, but they are more difficult to read, especially in long stretches in large slabs of text.^{1c,3} The problem is aggravated by the use of justified text. "Being exceptionally clear, Sanserif fonts are ideal for signposts".^{1c}

Although they are sometimes considered for headings and captions, sanserif fonts should not be used for TSD reports and memoranda. However, given their simple definition and clarity, they can successfully be used for faxes and email messages, but take care with the font size to avoid an inconsistent and unsightly appearance e.g. **The font used in this part of the sentence is Arial, with a font size of 11**, whereas the rest of the sentence is in Times New Roman with a font size of 11. As is evident, the Times New Roman font is easier on the eye.

3.0 OVERALL APPEARANCE AND PHYSICAL LAYOUT (cont'd)

3.2 Font Type and Size (cont'd)

Italics

Italic font is sometimes called cursive or oblique type because it is not vertically upright but sloped. It was developed in the sixteenth century from handwriting.^{1f}

Italics can be difficult to read and are best suited to serif rather than sanserif fonts. They have limited application in a technical document.

Italics should be used sparingly to emphasise a word or group of words, or to draw attention to an unusual word or one being used in an unusual way, or to highlight technical terms, if necessary. Note however, that technical terms should only be italicised for their first appearance.^{2a}

Summary of Conventions for Fonts

For maximum effectiveness use the following rules and guidelines:

- ◆ Use '**Times New Roman**' with a **font size of 11 or 12 points**.
- ◆ Do not use smaller font sizes for the body of the text – it makes the document more difficult to read, and distracts the reader. Small passages can be presented in a smaller font to achieve some special effect or emphasis.
- ◆ Do not use much larger font sizes for the body of the text – it can make the document look somewhat childish and primitive, it distracts the reader and casts doubts on the credibility and attitude of the writer.
- ◆ Do not use a mixture of fonts in the text – this is highly disconcerting for the reader. At the very least it is distracting, but it can also frustrate and irritate the reader, and cast doubt on the author's attitude and motivation.
- ◆ Use upper and lower case according to the basic rules of grammar e.g. use upper case for proper names, to start a new sentence after a full stop and for the names of the months and the days of the week. However, in general, there is no single correct rule in this regard that covers all situations, and some judgement may also be necessary.¹² More advice relating to refinery stream names and process equipment is given in Sections 6.5 and 6.10.
- ◆ Do not write in all capitals – this is the word processing equivalent of using a crayon. It distracts and irritates the reader, it may appear threatening, it reduces the credibility of the writer and detracts from the message.
- ◆ As an example, the font type used in this sentence is Times New Roman, with a font size of 11. The characters have a serif i.e. a short stroke on the feet and tails, which is important for readability.^{2c,3}
- ◆ Do not use sanserif fonts like Arial in the main business documents e.g. memoranda, file notes, reports, email attachments and letters.
- ◆ Sanserif fonts may be used for faxes and emails with a font size of 10.

3.0 OVERALL APPEARANCE AND PHYSICAL LAYOUT (cont'd)

3.3 Text Alignment and Word Spacing

Alignment and justification describe how the text is aligned with respect to the left and right margins of the document. In our word processing package there are four choices:

- ◆ Align Left – in this format the text is flush with the left margin, the length of each line varies and the right side of the text is ‘ragged’.
- ◆ Centre – means that the text is aligned about an imaginary vertical line down the centre of the page, and therefore the left and right side of the text is ragged.
- ◆ Align Right – the text is flush with the right margin and the left side is ragged.
- ◆ Justified – in this format, the text is set flush against both the left and the right margins, as is done in most books and journals.

For maximum readability, the spacing between the words in each line of text should be consistent and even.^{1g} This can only be achieved by using ‘left aligned’ text, with a ragged right margin. This also gives the reader’s eye a rest at the end of each line, which makes the document easier to read.³ The other advantages of left aligned text are that hyphenation can be significantly reduced, which improves readability, and the layout is simple, more natural and more pleasant for the reader.^{1e}

Do not use justified text i.e. the text flush against both margins. This has far too many disadvantages which combine to degrade the overall presentation and devalue the content of the document. Justified format creates large blocks of text which always appear dense and are difficult to read.³ It can also be more difficult to edit justified text e.g. when words are deleted on one line, other words are continually moved up from the following line to ensure that the line length remains constant, and this can be disconcerting and lead to errors. Moreover, justified text also introduces unintended large gaps between the words. Even and consistent spacing can rarely, if ever, be achieved with justified text.

Too much word space can also “create distracting rivers of white space that run vertically through the text”, as shown in the following example:^{1g}

This is an example of the use of justified text. With this style, the spaces between the words are automatically adjusted to keep the text running evenly down the left hand side and the right hand side of the document. The result is that quite large spaces appear between words and large rivers of white space run vertically through the text, as illustrated here. These effects are quite distracting and make the text difficult to read. “The optimum space between words, is in fact, surprisingly small and it is a common fault to exaggerate it.”^{1g} The magnitude of these effects is also determined by the selection of font type and size and the number of characters in each word. Therefore left aligned text should always be used.

Hence the rule is – **only use left aligned text**, with a ragged right margin, for maximum benefit.

3.0 OVERALL APPEARANCE AND PHYSICAL LAYOUT (cont'd)

3.4 Section Indentation and Numbering

Give careful consideration to numbering of sections and subsections. As discussed above, this will enhance the layout, avoid confusion and any apparent inconsistency. It will also force the writer to organise his or her thoughts on the structure of the document and how best to present the ideas in a logical manner. Therefore:

- ◆ Number the sections and subsections logically. In general, manual numbering is preferred since it is tried and tested, will avoid formatting problems and allow the section numbering to be continued at the top of each page, if appropriate. Automatic numbering is also a powerful tool since it can also be linked to the index or table of contents. However, historically this system has been complicated, user-unfriendly, and allows little or no flexibility. The writer must really be skilled to use this system effectively and avoid introducing other problems.
- ◆ Indent the subsections and, if necessary, the sub-subsections.
- ◆ For greatest effectiveness, keep the structure simple. Therefore, in general, the strong preference is to use only two levels of subsections i.e. sections and subsections. It should be fairly easy to stay within this limit in medium size memoranda and reports. However there may be occasions when you are forced to use another level, i.e. sub-subsections, especially for longer, more comprehensive documents. However, even in these types of documents, do not use more than three levels of subsections. Use of more numbered subdivisions i.e. lower order sections, severely upsets the appearance and organisation of the document and is unworkable.
- ◆ The following tab settings, in inches, are recommended: 0.15, 0.25, 0.35, 0.50 and 0.70, with:
 - The section number aligned at the left-hand margin of the page and the first word of the section heading at 0.35”.
 - The subsection number at 0.15” from the left-hand margin and the first word of the subsection heading at 0.50”. This means that the first number of the subsection will be approximately in line with the ‘.0’ in the section number.
 - The sub-subsection number at 0.25” from the left-hand margin and the first word of the sub-subsection title at 0.70”. This means that the first number in the sub-subsection will be about in line with the ‘.X’ at the end of the subsection number.
 - It is not necessary or possible to have all the titles of each section and subsection aligned. The aim is to end up with titles which are indented for emphasis and clarity.

Note: The corresponding tab settings in centimetres, are: 0.38, 0.63, 0.89, 1.27, 1.78.

- ◆ If more lower level ‘subsections’ are required, use an alphabetical character or a simple number, either with or without an underline. It is also acceptable to use just a heading either underlined, or simply in bold.
- ◆ Do **not** use: 1-, 1.-, 1), 1)-, or a-, a.-, a), a.) or a)-, or any other combination of these types of characters because they are ungainly.

An example of the use of effective indentation, alignment and designation of sections, subsections and sub-subsections is given on the following page.

3.0 OVERALL APPEARANCE AND PHYSICAL LAYOUT (cont'd)

3.4 Section Indentation and Numbering (cont'd)

Example

Use the following example as a guide for indentation and alignment:

<p>6.0 MODEL II UNIT DESIGN FEATURES (cont'd)</p> <p>6.1 The Model II Unit (cont'd)</p> <p>6.1.1 Layout and Flow Scheme</p> <p>6.1.2 Regenerated Catalyst Standpipes (RCSP's)</p> <p>a. <u>Standpipe Aeration</u></p> <p>b. <u>Catalyst Circulation Rates and Standpipe Stability</u></p>

Note: In this example the '6.0' is aligned with the left margin.

3.5 Headings, Bold and Underline

The main heading or title at the beginning of the document must be located in the upper centre of the first page. It may be written using upper case for the first letter in each main word and lower case for the other letters, which looks better and is more inviting than all capitals. A less preferred option is to use capitals for all words. In either case, the words should be in bold. Underlining of the document title/heading on the first page is therefore not required, although it may be used. If it is used, then consider underlining only the last line of the heading/title, rather than all the lines, which can be rather forbidding and messy, depending on the number of lines. If possible, keep the heading to one line.

As indicated in the above example:

- ◆ Section headings should be capitals and bold, without an underline.
- ◆ Subsections and sub-subsections should use upper case for the first letter in each main word and lower case for the other letters, and be in bold. No underline is used.
- ◆ All other lower order sections should use upper case for the first letter in each main word and lower case for the other letters. These headings should not be in bold.
- ◆ To emphasise selected words in the text use either an underline or show them in bold, but do not use an underline and bold together.

4.0 TABLES IN THE TEXT

Tables really do add clarity, as well as information, but they must be simple, clear, informative, reasonably small, and appealing to the eye. Tables in the text are preferred because they enhance understanding and efficiency and the reader does not have to go back and forth to an attachment. However, any table that is longer than half a page is a good candidate for being an attachment.

Therefore:

- ◆ The layout, column width, row height, and line densities all have to be carefully selected. For maximum effectiveness:
 - Do not show the left and right borders of the table. This opens up the table.
 - Use higher density lines to highlight the title row and the bottom of the table. The density should typically be 1 to 1½ points.
 - Use higher density lines to delineate the internal column borders (density typically 1 to 1½ points).
 - Use low density lines with a density of ½ to ¾ point, or no lines, for the rows within the table.
- ◆ Do not use large, bulky, complicated and unsightly tables in the text – they defeat the purpose of having a table
- ◆ Make the font size of the entries in the table one or two sizes smaller than that of the main body of the text – this will allow more information to be fitted into each cell and will minimise the size of the table
- ◆ Format the cells so that each entry is centred vertically
- ◆ Adjust the row height so that there is some space above and below each entry
- ◆ Centre and bold the column headings
- ◆ Centre align or left justify the entries, depending on their nature – be careful with numbers, which should still be lined up according to the decimal points
- ◆ With numbers, use a comma to separate the numbers before the decimal point, into groups of three to signify thousands, millions and so on. It is not acceptable to use a space instead of the comma. Refer also to Section 6.3.
- ◆ If percentage compositions are used, which ought to add to 100.0, the total must be shown and the numbers must indeed add to 100.0 percent. So check!

The tables given below are examples of the style which must be followed:

Source Unit	Sulphur (tonnes/day)
Revamped 2HDU, diesel service	160.0
FCCU with HVGO feed	45.5
Others	17.5
Total	223.0

Source Unit	Sulphur (tonnes/day)
Revamped 2HDU, diesel service	160.0
FCCU with HVGO feed	45.5
Others	17.5
Total	223.0

5.0 NUMBERING, BULLETS AND LISTS

Numbers and bullets are very effective when presenting lists of items which cannot be appropriately or reasonably presented within the main body of the text. They can also be a useful way of summarising findings, conclusions or action items. However, if they are not used or presented carefully, they can cause confusion and frustration.

In general, numbered and bulleted items must be succinct, specific and relevant to the text. They should not be complicated sentences or paragraphs which embody several ideas or issues. Since it is difficult to link bulleted items, if a relationship does need to exist between some items then they should be part of the text.

A discussion or introduction should precede a list of numbered and bulleted items, which puts the list into context and indicates why it is being presented. The purpose of this text may be to link ideas, issues, concerns or requirements, or summarise the outcome of the ideas that follow and which support the text. Often a concluding paragraph is required at the end of the list.

The use of numbers or bullets is not a substitute for logical, well presented discussion in the form of sentences and paragraphs. Bullets and numbers are generally used to present sets of information but not the text of detailed discussions, logic solutions or arguments.

If there are a few items in a list which are not referenced later or elsewhere in the document, use bullets. Otherwise use numbers or letters for these items.

The following guidelines and rules should be used for presenting numbered and bulleted lists:

- ◆ For long lists of items, the numbers or alphabetical characters can be entered manually or automatically. The automatic numbering system is useful for consistency but it's not without its own problems, especially when the sequence has to be broken for an un-numbered comment. In any case:
 - For numbered items in a list use the following format:
 - 1.
 - 2.
 - 3.
 - For alphabetically designated items in a list use the following format:
 - a.
 - b.
 - c.

Do **not** use: 1-, 1.-, 1), 1)-, or a-, a.-, a), a.) or a)-, or any other combination of characters. To do so, may confuse, frustrate and possibly irritate the reader.

- ◆ Select the bullet symbol carefully and conservatively e.g. solid circles (●), diamonds (◆) or squares (■), are acceptable.
- ◆ Bullet symbols should not distract from or overshadow the text. Therefore the symbol font should be 3 to 4 points smaller than the text e.g. use font size 8 for a bullet with font size 11 or 12 text, as is done in this document.
- ◆ This is an example of a font size 11 bullet with font size 11 text. Clearly this bullet symbol is too big and unsightly, and detracts from the text.

5.0 NUMBERING, BULLETS AND LISTS (cont'd)

- ◆ Minimise the use of sub-bullets but if there is a need to use them, then indent them and make them less striking than the main bullet. For example:
 - ◆ Example
 - Aaa, or
 - Aaaaa
- ◆ In general, the number or bullet symbol should be aligned left in line with the preceding body of text, and the text of the bullet should be indented by 0.25 inches (0.63 cm).
- ◆ Do not use Tabs with bullets. This is not required and can lead to confusion and errors in creating and revising your document.
- ◆ The same rules for presentation of text apply to bullets. Therefore avoid extensive long lists without any white space. In general, numbered and bulleted items should be separated by a spacing equivalent to one line space.

6.0 WRITING STYLE

6.1 Language and Expression

Much has been written on the use of language and expression in written work and several relevant references are listed in this style guide. You are urged to read and consider the advice given in these references as well as to find and consult other sources.

It is beyond the scope of this document to present a complete model for technical writing which contains a rigid set of rules. The final style of writing which you adopt will vary to some extent with the subject which is being addressed, the type of document which is being prepared and the audience. However there are some typical guidelines and conventions which you should use to improve the style of your writing, make it more interesting and increase your standing and likelihood of success in achieving your objectives.

The guidelines and conventions that are summarised in this section are based on our experience, and recommendations taken from the literature.

The most important point to understand and remember is that good communicators are made, not born.⁷ Your writing ability and your writing style can be improved only by reading, asking questions, taking advice from someone who has better writing skills and more experience and, most of all, by practice, at work and outside.

a. Active or Passive Voice^{5,6}

There is a natural tendency for technical writing to be serious, dry and written in the passive (impersonal) voice i.e. using third person pronouns and passive verbs. For example: “it has been determined” or “various catalysts have been examined in the test reaction”.

This tendency is due to the training and advice we received in science and engineering subjects from an early age, when the use of the active voice and pronouns like “we”, was just not allowed. Unfortunately this approach makes for terrible reading and creates a heavy document.

Nowadays however, it is recognised that the active voice can be successfully used in many, but not all documents, to make the text more lively and interesting for the reader. For example: “we determined” or “we examined various catalysts in the test reaction”.

When using the active voice, your writing will be more direct and vigorous and your sentences will be more concise. This promotes interest, readability, and understanding. As a general rule, write using the active voice and explain the subject as you would verbally describe it to a colleague i.e. be natural in your expression. However, don't get too conversational or use colloquialisms, because this can create the impression that the document is superficial, lacks professionalism or is carelessly prepared. The following examples illustrate the benefits:⁵

Passive Voice	Active Voice
Control of the bearing-oil supply is provided by the shutoff valves.	The shutoff valves control the bearing-oil supply.
Leaking of the seals is prevented by O-rings.	O-rings keep the seals from leaking.
Fuel-cost savings were realised through the installation of thermal insulation.	The installation of thermal insulation cut fuel costs.

6.0 WRITING STYLE (cont'd)

6.1 Language and Expression (cont'd)

a. Active or Passive Voice^{5,6} (cont'd)

The exception to the use of this style i.e. the active voice, is the presentation or statement of recommendations, when the passive voice is usually required e.g. "It is therefore recommended that an award.....".

In addition, it is generally better to use the word "we", which is consistent with a team and departmental approach, rather than the word "I", which could suggest arrogance, selfishness and egotism.

b. Word Selection^{5,8}

The choice of words used to express your ideas, observations and analysis is very important. There are no absolute rules, but the key to readability is simplicity, in the choice of words and how they are used. Try to stick to words which most people are familiar with. This does not mean that you should "dumb down" your writing, but that obscure words should generally be avoided, even if "technically" they fit the context. For example, use words like "enthusiasm" and "promptness" which are well known to most people, rather than "alacrity", which has the same meanings, but which very few people would be familiar with. Never use obscure words to impress the reader.

The number of words needed and used by people in daily life depends on what they do and their level of education. It typically varies from 600 to 5000.⁸ As process engineers we need additional specialist terms which must be used precisely in context.⁸

In addition, "we tend to use a wider range of words in writing than in talking. There are two reasons: firstly, the day-to-day shorthand or speech is no longer appropriate for writing, and secondly, you must introduce a greater variety of expression to avoid boring the reader".⁸

Do not repeat words and phrases too often when they are close to each other in the text. You must expand and develop your vocabulary so that you have a choice of different words e.g. show, present, demonstrate, establish, prove, identify, highlight, determine. Read as much as you can, and have a dictionary handy to check on the meaning and spelling of words you haven't come across before. Refer also to Section 9.0 for a discussion on dictionaries and thesauruses.

Technical terms must be used in your written work because that is the nature of the job. They are therefore used to enhance your writing. They should be used to communicate your meaning precisely, and you may need to explain or define the term, depending on your readers' level of understanding and experience.⁵ When it comes to technical descriptions it is important to be as specific as possible e.g. say 'a 40 ft spray dryer' rather than 'a tall spray dryer'. Moreover, "do not be content to say something is good, bad, fast or slow when you can say *how* good, *how* bad, *how* fast, or *how* slow."⁵ However, never use technical terms for the sake of using them or to impress your audience.

You must learn and use standard words, phrases and terms that are relevant and appropriate to the work you are involved in. For example, in describing the flow path of a stream, do not write that "the naphtha goes to the separator" but use clear, acceptable process engineering language. Therefore in place of the word "goes", use "flows", "is pumped", "is pressured", "flows under gravity", or "is routed".

Furthermore, avoid meaningless jargon, which one writer has described as "technicalese" e.g. never write "mobile dentition" when you really mean to say "loose teeth".⁵

6.0 WRITING STYLE (cont'd)

6.1 Language and Expression (cont'd)

b. Word Selection^{5,8} (cont'd)

Finally, avoid using words just for padding out your document. This practice bores, irritates and possibly confuses the reader, and your message will certainly be diluted, if not lost completely. There are two areas which are easily addressed. Firstly, avoid using many words when one or two will suffice. For example:⁵

Wordy, Waffly Phrases	Concise Substitute
During the course of	During
In the form of	As
A number of	Several, some, a few. This waffly phrase begs the obvious question 'how many?'

Avoid using tautologies or redundancies i.e. saying the same thing twice in the one phrase.^{11,5} Some examples are given below:

Tautologies (Redundancies)	Concise Substitute
Join together	Join
Revert back	Revert
Advance plan	Plan
A new innovation	An innovation
A paid professional	A professional
Rise up	Rise
Actual experience	Experience

You can easily identify and rectify the “padding” and redundancies during your reviews of the different drafts of your document. These are ideal opportunities to streamline, simplify and enhance your writing.

Keep your writing simple and to the point, and as far as is practical, keep sentences reasonably short and sharp. “Simplicity conveys a certain elegance – you don’t have to write long, complex sentences to appear scientific.”⁶ However, as stated above, this does not mean dumb down your writing.

Finally, remember, you can increase your word power only by reading and listening, and maybe watching some television, and most of all, by practising your writing. “Be adventurous. If you come across a new word, look up the meaning and mentally file it away for future use. Over time your vocabulary will broaden and ripen, allowing you to express yourself in new and richer ways.”⁸

6.0 WRITING STYLE (cont'd)

6.1 Language and Expression (cont'd)

c. Spelling

Despite what some “progressive” teachers may think and advocate, spelling **is** important.

If your knowledge of words and spelling is weak, then you must use a dictionary for assistance. You can even use the spelling checker in the word processing package, but be aware that it has its dangers. It won't understand the context, so “deign” is acceptable and not a mistake, but the real word you want to use is “design”. So using this tool does not relieve you of the responsibility of proper, thorough checking.

It's better to use British English spelling in most cases e.g. metre and not meter (which actually means to measure), colour not color, modelling and not modeling, sulphur not sulfur. There are always some exceptions. In some cases convention may override this guideline and in other cases it may be what is more aesthetically appealing, which requires some judgement e.g. ‘hydrodesulphurisation’ looks better than ‘hydrodesulphurization’. British English spelling is also a corporate requirement.

Words that end in ‘ize’ and ‘ise’ can cause a problem. The English tend to use the latter form e.g. “realise”, which is softer, but the word “realize”, which is the American form, is historically correct and, in the majority of cases, is directly linked to the Greek origins of the word. More important however, is to avoid using the ‘ize’ ending for all similar words e.g. ‘advertise’ simply does not have an ‘ize’ ending under any circumstances and there are many words which fall into this category. Practically speaking, it is safer to use ‘ise’ everywhere, but if you're unsure, then use a dictionary. Whatever convention you use, you must be consistent within the document to avoid irritating the reader.^{2g,12}

Obvious mistakes, which could be classed as typographical errors, are easily found through proper review and proof reading of your document. If you don't find and correct such errors and leave them scattered throughout your document, then the reader will be left with a bad impression of your abilities and attitude. Your reader will value your document based on how much you, yourself, value your own document.

d. Punctuation

Punctuation is always important. Full stops, commas, colons, semi-colons, brackets, apostrophes, quotation marks (inverted commas), have all been developed to allow ideas to be expressed in the best possible way. They complement and enhance the words and their usage. Some examples follow:

- ◆ Commas give the reader time to pause and catch their breath, perhaps take in relevant phrases, and to link different parts of the sentence. More importantly, they affect the meaning of a sentence. For example, the following sentence is a lucid statement, but without commas in the right locations it is meaningless, “That that is is that that is not is not”. Where would you put the commas? (The answer is given at the end of Section 9.) A second example shows how the meaning can be distorted by putting the comma in the wrong place. It refers to the giant panda which “eats, shoots and leaves”. Does it actually have a gun?¹⁰
- ◆ An apostrophe is used to denote ownership e.g. the refinery's normal throughput, or to indicate the omission of letters e.g. don't (do not) and it's (it is). It's easy to forget or misuse an apostrophe e.g. ‘last year's performance’ should be used and not ‘last years performance’. In addition, to indicate ownership where a plural is involved, the apostrophe should be after the ‘s’ e.g. the companies' combined profit. In general, contractions e.g. don't and it's, are not preferred for technical writing. Recognise when an apostrophe is needed and take care when using it. The correct use of apostrophes is something of a defining notion in modern English in separating the literate from the illiterate.

6.0 WRITING STYLE (cont'd)

6.1 Language and Expression (cont'd)

e. Grammar

The terms nouns, verbs, adjectives, phrases and clauses may now seem a distant memory from early schooling. However, there are certain rules which have to be followed. Without these rules the words simply will not fit together and your ideas will be lost in clumsy and fundamentally wrong sentences. In some cases the words will not even form proper sentences.

So pay attention to grammar and follow the basic rules.

You cannot rely on the word processing package to help you with grammar, except perhaps in the most basic areas like the use of singular or plural nouns and the nature of the verb ending e.g. the stream flows or the streams flow, but not a combination of both. Unfortunately, the word processing package often gets this fairly straightforward rule wrong.

f. Pedantry

Do not be pedantic i.e. don't be nit-picking, or split hairs, or be excessively formal or fussy. You should not blindly follow rigorous or traditional rules if they make your sentence sound clumsy or just wrong. An example is the use of the split infinitive, in which a word is placed between the 'to' and the 'verb' e.g. to boldly go. In this case, 'to go boldly' sounds all right, but 'to monitor more accurately' sounds clumsy compared with 'to more accurately monitor', which sounds much better. A second example is an archaic convention that sentences should not end with a preposition e.g. in, on, with, under... As Winston Churchill once remarked, "This is the sort of nonsense up with which I will not put". In other words, your sentences have to sound good, reasonable, logical, as well as contain the right ideas. If it doesn't sound right when read out loud, then it probably isn't.

6.2 Sentence Length

In general, for maximum effectiveness in your writing, avoid long sentences. Very long sentences, especially those without proper punctuation, can become convoluted, and can very easily confuse, bore, tire, and possibly irritate the reader. At the very least, they distract the reader from the point you are trying to make.

Short sentences are easier to grasp than long ones, and the occasional short sentence provides relief from the longer ones. However, too many short sentences in quick succession can be disturbing and distract the reader as well.^{2d,5}

Ideally, the text should contain a mixture of short and long sentences.

Much has been written about sentence length. For example:

- ◆ Research has shown that our working memories can only process about 25 words at a time, so try to limit sentence length to 15 to 20 words.³
- ◆ A survey by Harvard professor D.H. Menzel indicates that in technical papers, sentences become difficult to understand when they exceed 34 words in length.⁵
- ◆ The target for average sentence length in Plain English documents is 20 words. However the average in fiction is around 15 words.^{2d}

6.0 WRITING STYLE (cont'd)

6.2 Sentence Length (cont'd)

Based on our experience, the optimum average length of sentences in technical documents is equivalent to about 25 to 30 words, and this should be your target. Sentences can obviously be shorter or longer, depending on the subject, context and content. However, it is important that you go over your text and break the long sentences into two or more separate sentences. A good guide for keeping sentence length under control is to write sentences that can be spoken aloud without losing your breath. Do not take a deep breath before doing this test!⁵

6.3 Numbers in the Text

In the main body of the text, numbers can be written in words or as digits.

- ◆ For smaller numbers e.g. one to ten, words may be preferable, depending on the context.
- ◆ For larger numbers use digits.
- ◆ At Bapco, and in many other countries, it is standard practice to use a 'dot' or 'full stop' to designate the decimal point separating the integers from the decimal fraction part of the number. However, in some countries a 'comma' is used instead of a 'dot' and this can obviously lead to confusion. Therefore, be careful when reviewing the data in correspondence from overseas companies.
- ◆ With numbers in the text, use a comma to separate the numbers before the decimal point into groups of three i.e. into thousands and millions and so on.
- ◆ With numbers in the text, it is also possible to use a space to separate the numbers before the decimal point, into groups of three. However, this approach is problematic, and may cause confusion and upset the look of the sentence because the groups of 3 numbers could appear as words. Although ISO 1000¹⁷ infers this approach, and it is routinely used in some countries, possibly because a comma is used in place of a decimal point, at Bapco it is not recommended for text – use commas as indicated above.
- ◆ Use digits to express the full number if the order of magnitude is less than a million e.g. 24,000.
- ◆ If the order of magnitude is millions then use the word "million" e.g. 3.8 million.
- ◆ For currency, express dollars as either US\$ or 'dollars' depending on the context. The same applies to euros (€). Do not leave a space between the symbols and the numbers e.g. use US\$52,500 and not US \$ 52,500 or US\$ 52,500.
- ◆ For currency, use the word 'million' e.g. US\$3.8 million, or, less preferably, use the abbreviation 'MM' e.g. US\$3.8 MM.
- ◆ For a currency range in the millions, use numbers and words for maximum clarity and appearance e.g. US\$125 to 150 million per year. An acceptable alternative is also to use abbreviations and dashes in the text e.g. US\$125-150 MM/yr.

6.4 Dates^{1b,2b}

The format for dates should be day, month, year, which is a logical sequence and requires no punctuation. For the example of the date "8 October 2005":

- ◆ As stated above, do not use punctuation e.g. 8 October, 2005
- ◆ Use the cardinal number i.e. 8, rather than the ordinal i.e. 8th. This has been a growing worldwide trend which started many years ago, and should be followed. Use of the ordinal adds nothing and distracts from the main text.
- ◆ Avoid expressing the date purely as numbers i.e. 8/10/2005, because this looks ugly in the main body of the document and it can lead to confusion, because in the US, the normal convention is to put the month first, followed by the day e.g. 10/8/2005.

6.0 WRITING STYLE (cont'd)

6.5 Abbreviations

Use appropriate, common abbreviations to enhance your writing and improve the presentation and readability of the text, but use them properly.

Technical terms can be abbreviated but when they are first used in the document they should be presented in their full form, followed by the abbreviation in brackets e.g. Heavy Vacuum Gas Oil (HVGO). Thereafter the abbreviation should be used without further definition.

The same approach is taken with equipment and equipment numbers. When equipment is first referenced, it is very important to use the full name of the item followed by the equipment number. This is to ensure that the equipment service and function are properly defined e.g. Product Stripper C8406. Do not introduce and use equipment numbers without the equipment name and service because this will create confusion, doubt and irritation, which will certainly detract from your message.

Latin abbreviations can be used very effectively to improve readability. Common abbreviations and conventions are as follows:

- ♦ **e.g.** – means “for example” and comes from the Latin *exempli gratia*. A comma may be used before, but not immediately after, the abbreviation. Full stops are required. This abbreviation is best used with a short phrase or list. It should not be used if it precedes and is connected with another long sentence or long list. In these cases use a separate sentence starting with the complete words “For example”.
- ♦ **i.e.** – means “that is”, or “that is to say”. It comes from the Latin *id est*. A comma may be used before, but not after, the abbreviation. Full stops are required.
- ♦ **viz.** – means “namely” and comes from the Latin *videlicet*. A comma may be used before, but not after, the abbreviation. The full stop is required.

An exception to the above is the abbreviation “**etc.**” which stands for *et cetera*, and means “and the rest” or “so on” or “and others”. This is a much over-used and largely meaningless abbreviation. It is not appropriate in formal writing.^{1j} It is often discouraged because of its inelegance, its discourtesy to the reader, and the implication that the writer is being lazy or is short of information, which is more often than not the situation.^{2e} Therefore do not use “etc.”.

The Latin phrase *status quo*, which means “the existing situation”, can sometimes be used. However, be careful not to use phrases like “the present status quo” or “the status quo situation”, each of which contains a repetition of the same ideas.¹ⁱ

6.6 References in the Text and Lists

Text

In most documents it will be necessary at some stage to reference other work within the main body of the text e.g. other documents, articles or meeting notes. The best way of referencing this external information is to use a superscript number or letter after the full stop at the end of the relevant sentence. This is the convention which is followed in this style guide.

Do not use the full reference in the text because it is a gross distraction for the reader, the train of thought embodied in the sentence is severely disrupted, and the whole point of the sentence or paragraph can be lost.

6.0 WRITING STYLE (cont'd)

6.6 References in the Text and Lists (cont'd)

Lists

A list of “References” should be included as the last section in your document. In a long report it will be a separate numbered section of the document. In shorter communications like a memorandum, it will be below an underlined heading.

In either case, the references should be presented as a numbered list. Particular references can be included as a subset of a main reference and these should be designated using letters. Refer to the References section of this style guide for an example of the required format.

Use the following guidelines for arranging and presenting lists of references:

- ◆ The font size for the list of references should be one to two sizes smaller than the main body of the text. The same requirement applies to the list of “Attachments”.
- ◆ It is not necessary to indent the main references in a long list. The reference numbers can be aligned with the section number or the first letter ‘R’ in the word ‘References’ in the section title.
- ◆ References to internal documents should be presented with the title in quotation marks, followed by the type of document, the author/authority/sender, the recipient, the date and the TSD General Office file number.
- ◆ Literature references should begin with the author’s surname, followed by the author’s initials, the title in quotation marks, the name of the source journal, the year, volume and number of the publication and the page numbers.

6.7 Brackets^{1a,2f}

Brackets, which are also called “parentheses”, are sometimes used, but are often detrimental to the document, and are best avoided. Unfortunately brackets tend to break up the flow of the sentence and are visually disturbing. In most cases, you will find that commas, or less preferred, dashes, are a satisfactory alternative to brackets.

If there is an overwhelming need to use brackets, then follow these rules:

- ◆ Round brackets are the most common type of parentheses i.e. (). They are used to enclose abbreviations and material that provides additional information or comment. The sentence must be grammatically complete with or without the bracketed information.
- ◆ Avoid the use of long phrases or even sentences inside the brackets – these are not appropriate, severely disrupt the flow of the sentence and distract the reader from your idea. If such information really is needed, then present it as discrete sentences, even if it means slightly restructuring your page or document.
- ◆ A comma may be used after the closing bracket. However, never use a comma before the opening bracket.
- ◆ If you do have to use brackets, then remember that the standard for punctuation and grammar within the brackets remains the same as that for a normal sentence.

6.0 WRITING STYLE (cont'd)

6.7 Brackets^{1a,2f} (cont'd)

The following example illustrates the use of brackets, the conventions, and the improvement which can be made by deleting the brackets.

“I set up the easel (which I had recently purchased), laid out my paints and selected a brush.”

Note the comma after the closing bracket. More importantly, this sentence, without the brackets, looks better and conveys the same meaning. For example:

“I set up the easel, which I had recently purchased, laid out my paints and selected a brush.”

6.8 Dashes^{1k}

In general, dashes should be avoided in your technical writing.

Dashes can easily disrupt the flow of the sentence and readability. It is better to use commas or separate sentences. However, there may be some occasions where dashes need to be used.

The words contained between a pair of dashes will usually emerge more prominently or become more emphatic. Unfortunately the effect will be lost if the “dashed” section is too long. In this case, the reader may be drawn to a different train of thought, which can be convoluted or confusing, and then find it difficult to put this information into the context of the main sentence. Unfortunately there are many people who use dashes to add extraneous or irrelevant material, when really, separate sentences are needed in their own right. So, great care is needed when using dashes. In addition:

- ◆ A single dash towards the end of a sentence is more acceptable than a pair of dashes in the middle of a sentence.
- ◆ Dashes are most effective when used sparingly.
- ◆ Do not use dashes to take short cuts on grammar

6.9 Page Numbering

Page numbering and the position of the page number are important, especially in longer documents. It is also important to let the reader know how many pages there are in the document, a convention which will also highlight any missing pages.

The traditional position for the page number is the top outer corner of the page, either as part of the running header or alone.^{1m} Therefore this is where most people expect to find the page number. This also means that in our technical documents, which are normally printed on one side of the paper only, the page number should be at the top right hand corner, usually as part of the header. It is particularly important for page numbers to be easy to find and to read, and a reader will tend to look at the top of the page first.^{1m} Page numbering at the top outer edge also facilitates leafing through the pages.

Some books and journals have the page numbers at the bottom centre of the page, especially when other important material needs to be at the top, but this is less preferred and should not be used for our technical documents.

6.0 WRITING STYLE (cont'd)

6.9 Page Numbering (cont'd)

When numbering the pages of your documents:

- ◆ Use the automatic pagination in the header, i.e. 'Page x of y'.
- ◆ Use Times New Roman with font size 9.
- ◆ In shorter documents, like a two or three page memorandum or letter, it is still important to let the reader know how many pages there are. If it's not appropriate to have a page number on the first page, then use the normal page numbering convention on the following page(s). In some exceptional cases, e.g. a formal company letter from the president, it is acceptable to put a page continuation i.e. '.../2', at the bottom right hand corner of the first page, and then use the normal page numbering convention on the following page(s). However such continuations should not be used for our technical documents.
- ◆ For longer documents, start the page numbering from the first page of the text or introductory page. In such documents, use roman lower case numerals i.e. i, ii, iii and so on, for preliminary pages e.g. a preface or separate summary, or a table of contents.

6.10 Other Guidelines

There are many other aspects to your writing that could be considered trivial and that can easily be taken for granted, but which nevertheless can be used to greatly improve your document.

For example:

- ◆ Use subscripts and superscripts to enhance the presentation and readability e.g. H_2S is better than H2S and m^3 always looks better than m3. The subscript and superscript forms are both easier to read, are logical, and consistent with technical conventions.
- ◆ In general, leave a space between a numerical value and the associated unit(s), especially when the units have more than two characters e.g. use '125 psig' rather than '125psig', and '75,000 BTU/hr-ft²' instead of '75,000BTU/hr-ft²'. However, there are some exceptions which should be followed e.g. use '120°F' and not '120 °F'. Use some judgement to ensure that the text looks right, reads well and that there is no confusion or ambiguity.
- ◆ Use the degree symbol (°) for a temperature value e.g. 120°F, and not the word 'degree' or 'degrees' or 'deg'. Do not use a superscripted zero i.e. 120⁰F, as a substitute for the degree symbol.
- ◆ A useful way of expressing and emphasising a temperature difference is to use 'degF' to differentiate it from a temperature reading '°F'.
- ◆ Use a hard space or a hard hyphen at the end of a line of text to avoid stranding an odd letter, number, word, or part of a phrase. Use CTRL-shift-space or hyphen.
- ◆ Avoid contractions or abbreviations of standard terms e.g. use 'laboratory' and not 'lab', use '2Poly' and not 'poly plant'.
- ◆ Do not use phrases like 'basis the above' or 'basis this'. This terminology is an old Caltex convention which was originally used for telexes. It is outdated and grammatically incorrect. Instead use the full expression e.g. 'on the basis of the...'
- ◆ The first letter of a product stream name should be a capital e.g. Light Isomate or Heavy Catalytic Naphtha (HCN). However do not use capitals for general streams e.g. hydrogen, naphtha (unless it is a rundown product), kerosene, diesel.
- ◆ In general, use the term 'refinery' rather than 'Refinery'.

6.0 WRITING STYLE (cont'd)

6.10 Other Guidelines (cont'd)

- ◆ The first letter of equipment names should be a capital e.g. HP Separator, Main Fractionator, Product Stripper. Do not use capitals with generic references to equipment e.g. pumps, heat exchangers, coolers.
- ◆ When using concentrations expressed as 'ppm' and in most cases, 'percentage', remember to show the basis i.e. weight, volume or molar. Use 'wppm' not 'ppmw', 'vppm' not 'ppmv' and 'wt%' not 'wt %' or '%wt'.
- ◆ For pressures, remember to state the basis i.e. gauge (g) or absolute (a). For example, use 100 psig or 100 psia. However, for pressure drop use only 'psi', which is technically correct.
- ◆ When using a slash i.e. '/' do not leave a space between the word on each side of the slash and the slash itself. For example, use 'and/or' and not 'and / or'.
- ◆ Do not use 'MT' as an abbreviation for 'metric ton'. The latter term actually means 1000 kilograms (kg). It is written as 'tonne' and has the symbol 't'. Therefore define 'tonne' as 1000 kg in the document or table, and thereafter use either the word or the symbol, as necessary.
- ◆ Use the symbol 'M' as the multiplier equivalent to 1000. This is the standard at Bapco. Do not use the symbol 'k' or 'K'. The latter actually means kelvins, which is a measure of absolute temperature.

7.0 EMAILS AT WORK ('Engineering Emails')

7.1 Introduction

In business, the ever-present email has to some extent, replaced the formal memorandum as the main medium for transferring information. Unfortunately, the same care, attention to detail and application of rules and conventions for writing and presentation, which are used for formal documents, are often missing in email messages. The email has become so important in our normal business and there is so much potential for getting it wrong and creating potentially serious problems, that it requires a separate, critical review.

We live in the electronic age where essentially instantaneous communications e.g. email and text messaging, are a way of life. Consequently, there is a tendency at work to use the same rather informal, colloquial or even abbreviated style of writing that is routinely used in non-work related communications. More often than not, this means that grammatical correctness, spelling, punctuation, and structure are not considered important, and that rules and conventions may be ignored.

While this could be considered acceptable outside work, this is not the case in business. Therefore, it's very important to remember that emails are still technical documents and that you, the engineer and author, must be steadfast and vigilant in guarding against bringing these sorts of private communications habits into the workplace. **Regard any email message as a formal memorandum.** As with more traditional formal documents, emails are still "a written mode of communication that highlights a person's ability - or inability - to write".⁹

Generally, emails should be used for short messages, either to convey specific information, short answers or advice on particular issues, or as the modern equivalent of a covering memorandum which relates to attached documents.

Emails are not suitable for presenting a large body of information or tables. It is highly likely that any formatting will be lost in the sending and receipt of the message. This means that the message can come out garbled. Therefore, for reasonably sized documents or where formatting is important e.g. tables are required, use attachments prepared in the word processor, which allows normal rules and conventions to be followed.

7.2 Main Governing Points

There are some important general points governing the use of emails which must be observed:

1. Email is **not** a substitute for meeting and talking with the recipient(s), or for telephone conversations. So in the majority of cases, talk to the recipient before sending your message. The email is then used to summarise the discussion. The main advantages are that the recipients will not be surprised, the likelihood of misunderstanding is minimised or avoided, you might learn something which will influence or moderate your approach, or you may change the emphasis.

Therefore, in general, if you can't start the message with "As discussed", then don't bother sending it.

2. Emails must have a definite purpose.⁸ If they don't have an objective, then the more you say, and the more often you say it, the less likely it is that anyone will pay attention and the more likely it is that you'll create problems for yourself and the department.

7.0 EMAILS AT WORK ('Engineering Emails') (cont'd)

7.2 Main Governing Points (cont'd)

3. Emails are forever. They can be rapidly and widely distributed, easily stored and can come back to haunt the author. They are their own records and can be held against you. Microsoft, Enron, and others learnt this lesson the hard way through the courts in the US. Therefore take great care in creating your email message, choose the words carefully and make sure that it's properly reviewed and approved. Include only content that is appropriate to your professional position at work.⁸ The normal steps taken in preparing and issuing a memorandum must be followed when generating an email.
4. Thoroughly read and check your message for correctness and relevance. Before issuing emails have them checked by a colleague or supervisor, as appropriate. Too frequently people send emails following first drafts. This typically leads to errors. Precisely because emails can be prepared quickly and easily, and they may seem trivial, many people ignore the proof-reading and checking step. This has led to many embarrassing and unfortunate instances e.g. one message came from a very high corporate level, addressed to all lower levels and areas, which described arrangements for various work shifts. Unfortunately the author didn't pick up the error in which the letter 'f' was missing from the phrase 'all shift employees'.
5. Do not forward emails to others for checking. This will only lead to confusion. The company is not adopting a paperless office concept. So print out a hard copy of the email and hand deliver it to the checker. Provide background information to the email to assist the checker in effectively reviewing it. This is efficient as well as professionally courteous. It is also important to realise that proof reading on the screen is never very effective and most people will print a hard copy if they don't have one. This has the added advantage of highlighting any miscellaneous editing comments which have been mistakenly left at the bottom of the document.
6. Keep messages short and to the point. Most people don't read below the bottom of the screen. Moreover, as stated above, use attachments for longer documents including tables of data. This approach also allows the attached document to be properly formatted and specified with a formal title, date, revision number and with 'prepared by', 'checked by' and 'approved by' blocks, to be used as appropriate.
7. Never use a table of data in the body of an email message because of doubts on formatting and the risk of it being garbled at the recipient's end. Tables must be given as an attachment to the email and properly titled and referenced.
8. Clearly state the action you want to be taken, or your recommendation. Make sure that it is not inferred or buried in many lines of text.
9. Do not issue emails to colleagues within the same department, unless it is to document a discussion or agreed course of action. Emails must never be a substitute for walking across or down the corridor to talk.
10. Do not use emails to circumvent correct communication channels and schedules of authorities. There have been examples of people at a lower corporate level writing to general managers or higher levels, with complaints or asking for information or follow-up, and employees bypassing several layers of the management structure and requesting meetings with the manager. The company's chain of command must be respected.
11. Decide carefully on the addressee(s) and the distribution list. Ensure that they are the appropriate and relevant people for your message. It is equally important that you do not include someone who should not or would not want to receive your message.

7.0 EMAILS AT WORK ('Engineering Emails') (cont'd)

7.2 Main Governing Points (cont'd)

12. When replying to emails, do not just hit the "reply to all" button. Ensure that the recipients i.e. the addressee(s) and those on the copy circulation list are relevant to the subject and the message. Too many times an email is initiated and copied to multiple parties, many of whom do not need to be copied, and probably do not want to be copied. Hence do not add to the problem by thoughtlessly replying to everyone.⁸
13. Sometimes you will receive an antagonistic or abusive email, which is very upsetting and can easily move you to anger. This sort of unprofessional behaviour goes on in any organisation. In such a situation do not reply immediately, in the heat of the moment. Allow yourself some breathing space to calm down, and discuss the matter with your supervisor and/or colleagues. If you decide to reply, then prepare a formal, cold, technical and factual reply. Your reply must be kept on a technical level highlighting the deficiencies, whatever they might be, in the original message. It should not be a personal attack on the originator of the email message. Typically send your reply the next day.
14. Never use emails to call for a meeting. Always talk to people in person or via telephone to establish the mutually convenient date and time, and then follow up with a final email of confirmation. If you don't do this then you can end up with many, many emails, all with different views, suggestions, and changes, all of which clog up the inboxes with useless information.
15. To avoid the tone of your message and your attitude being misunderstood, never use emoticons, and be careful with your use of conventional punctuation e.g. even an exclamation mark can appear as very strong and threatening.
16. As everyone is well aware, we are inundated with emails at work. Supervisors can easily get more than 50 in a day. Most emails are not needed, but unfortunately all have to be read at some stage in case there is a real request or action item. Therefore, contribute to improving the system by ensuring that your messages really are required and by copying only those who really are concerned with the subject. Do not use general copy lists.

7.3 Email Etiquette and Conventions

Although the presentation of emails is less formal than that of business letters, there is still a certain etiquette and style to be followed.

- ◆ Use Arial size 10 font.
- ◆ Use black rather than different colours for the text, which do not print or copy well.
- ◆ If you have edited a message for forwarding, then it is likely that the changes are shown in a different colour. Therefore, before sending the message, ensure that all the text is in black.
- ◆ Do not use coloured, 'flowery' or 'artistic' backgrounds in your email messages. They are distracting, frustrating and annoying and have no place in a professional document.
- ◆ Start the message with the name(s) of the recipients only, and ensure that the names are spelled correctly to avoid inadvertent insults.
- ◆ It is also acceptable not to have any names but just start with the message.
- ◆ Do not open with "Dear" – this is reserved for formal letters only.
- ◆ Do not open with "Gents" – this is reserved for the Men's Toilets. If you wish, use "Gentlemen", but ensure that you do not use this opening if the audience includes ladies. Hence, as mentioned above, it is better not to use any opening at all.

7.0 EMAILS AT WORK ('Engineering Emails') (cont'd)

7.3 Email Etiquette and Conventions (cont'd)

- ◆ End the message with a simple complimentary closing of “Regards” or “Thanks”, followed by your name and possibly your telephone extension. It is also acceptable to leave out the complimentary closing. In any case, do not make the complimentary closing into a grandiose or subservient gesture – it’s not needed and is not appropriate for our business environment.
- ◆ In general, and especially within the company, do not add any other details after your name e.g. position, title, telephone numbers (work, home, mobile), fax, and email address. This is a waste of space. Besides, in most cases the recipient already has this information, especially at Bapco, or if they need it, they’ll ask. This practice may also be regarded as showy and egotistical. There are some exceptions e.g. when first contacting an outside organisation or company.
- ◆ Choose the subject title carefully. It must be relevant, succinct, and in some cases may even effectively summarise the purpose and content of the message e.g. a meeting time and date.
- ◆ Do not leave the subject line blank, or use an irrelevant title – this leads to confusion and creates some doubt about the subject.
- ◆ Do not reply to an email, retaining the subject, and then write about a different topic. This is lazy and confuses the reader, and it’s unprofessional.
- ◆ If you need to revise an attachment to an email, save the attachment as a separate file with a new name, revise and save the document, and then attach it to your outgoing email message. Do not update the existing attachment and keep the same file name. This is procedurally wrong, it is confusing at the very least and it could have serious implications if the information is misinterpreted or wrongly used.
- ◆ Do not adopt the practice of repeatedly replying to emails on one subject, and allowing previous messages to accumulate at the bottom of the current message. This is unnecessary, certainly a waste of space and probably paper, and it doesn’t have any benefit. No one seriously wades through pages and pages of earlier messages. Therefore reply and keep only the last one or two messages, if necessary. File earlier messages. Avoid the ridiculous situation of having ten or twenty pages of messages as part of your current message. Discourage the practice in others. Use electronic filing and retrieval to store and research the background to the subject.
- ◆ Do not request a ‘reply receipt’ on your email. This practice can appear presumptuous and threatening and annoys the recipients. It suggests that the originator equates ‘receipt’ with ‘acceptance’ and ‘action’ on behalf of the recipient, which is just not true.
- ◆ Since the ‘send’ button and the other editing functions are on the top toolbar, it’s easy to send a message before you have finished writing it, and before it has been reviewed by others. The best way to avoid prematurely sending your message is to ensure that you don’t put the addressee or cc list into your message until it is final i.e. until after it has been reviewed and approved by your supervisor and others who are concerned.
- ◆ Remember to actually attach the attachment, and check that the attachment is what you want it to be. Open the attachment and check it before sending any message.
- ◆ Use complete, grammatical sentences. Emails are not the modern equivalent of telexes in which it was a point of honour to minimise the number of words, as well as the cost. There are examples of people who still use this minimalist approach and their messages are sometimes incomprehensible. In particular make sure that you use the indefinite article ‘a’, and the definite article ‘the’, as appropriate.

7.0 EMAILS AT WORK ('Engineering Emails') (cont'd)

7.3 Email Etiquette and Conventions (cont'd)

- ◆ Emails must be grammatically correct. Do not use shortcuts and abbreviations that are accepted for private communication and 'sms-ing' e.g. do not use "u r l8" but "you are late".
- ◆ In general be polite e.g. the genuine use of the words 'please' and 'thanks' will certainly enhance your message. However there are also occasions when your message needs to be very formal and firm, and to achieve this tone, the words, structure and even the distribution list need to be carefully selected.
- ◆ Even though emails are generally short documents compared to memoranda and reports, they must be structured in the same way. Use subtitles and bullets, as appropriate, to present information clearly.

8.0 OTHER REQUIREMENTS, CONVENTIONS AND GUIDELINES

8.1 The First Page

In a memorandum or file memorandum:

- ◆ Put the document type, and if needed, the addressee, in bold, at the top left hand corner e.g.

Memorandum

To: Manager - OPD

- ◆ The subject heading for most documents must be centred at the top of the document. Do not cram it into the top right hand corner as was done many years ago before word processing was available.
- ◆ Do not put a date on the document. This will be done by the General Office when the document is issued.

8.2 The Signature Page

Usually, the last page of the main body of the text will contain the signatures e.g. the author of the file memorandum, the Manager Technical Services, or a list of authorities who will sign the document indicating agreement, endorsement and approval.

The signature page must always include the “punch line” of the document i.e. the over-riding conclusion(s) and recommendation(s), the requested action, which must be clearly stated, and the costs which are involved. Apart from being professionally courteous and business-like, it is vital to ensure that the signatories know what they are signing for, and why.

It is preferable to have the list of attachments, the references and the distribution list on the same page but this is not always possible. It is therefore acceptable to put this information on the following page, if necessary.

8.3 Attachments

The ‘Attachments’ or ‘List of Attachments’ should be presented as a proper numbered list below the signatures. Use the full title of each attachment and show the number of pages in brackets at the end of each attachment. For example:

1. “.....” (3 pages)
2. “.....” (2 pages)

Use a font size which is two sizes smaller than the text i.e. font size 9 or 10, to minimise space requirements, and to ensure that the list does not overshadow the main text.

8.4 Distribution Lists

The distribution list i.e. the ‘cc: list’ always comes as the last section on the last page of text. It is not numbered. Although distribution lists may seem trivial, they must be given very careful consideration.

8.0 OTHER REQUIREMENTS, CONVENTIONS AND GUIDELINES (cont'd)

8.4 Distribution Lists (cont'd)

In general, avoid huge lists and make sure that you send the document only to people who really need to know.⁸ This will include the people who may or will be making the decisions, and those directly involved in the work or who will need to become involved, perhaps as part of a team. Always include your immediate colleagues, other relevant engineers in the department, and those who contributed to the work, especially those who provided information and are quoted.

Not everyone needs to see all the attachments. Therefore you can have two lists: those to be copied 'without attach', and those to be copied 'with attach'.

For departmental recipients use initials e.g. SS, GML, HAQ, to indicate that each person gets a separate copy. If the intention is to circulate one copy through several people, then use a slash to separate the initials, e.g. SS/GML/HAQ. Do not put a space between the slash and the initials. For recipients outside the department use abbreviated position titles, sometimes with the initials or the name in brackets e.g. Supt FCCU-OPD or Supt P&U (EHM).

Include relevant TSD General Office file numbers at the end of the distribution list.

As the author you will probably need two or three copies e.g. one for the work file, one for the group's Outgoing Correspondence File and, if necessary, one personal copy for future reference. This requirement should be signified by putting the number of copies in brackets after your initials e.g. HAQ(3). Note that there is no space between the last initial and the opening bracket.

Use font size 9 or 10 so that the distribution list doesn't overshadow the conclusions, recommendations and signature(s), which are normally on the final page. The font size should preferably be less than that used for the attachments, but can also be the same size.

8.5 Electronic File Names and Filing

In the bottom left hand corner of the last written page of the main body of the text of the document, state the document electronic file name and path so that it can be found and revised, or used as a starting point for another document in future. Make it clear that it is the document file name - use "file:" followed by the name. Do not put the file name in the footer.

Keep the file name appropriate and succinct. Use appropriate abbreviations. Be careful if using the whole document title as the file name – this could mean ending up with a long sentence, which would be a waste of space and could create a suggestion of laziness or lack of imagination.

Consider starting the file name with a letter which indicates the type of document e.g. 'l' for letters, 'f' for faxes, 'm' for memoranda, 't' for transmittals, 'n' for notes and so on.

Since documents will be modified and you may want to keep earlier revisions, or there may be several in a series e.g. routine reports, include in the file name an abbreviated date and revision number e.g. '-01' or 'revA'. Examples of file names are:

- ◆ file: c:\mydocuments\work\tsd style guide-revB.doc
- ◆ file: c:\work\process descriptions\descr-rxn-regen-01.doc
- ◆ file: p:\catalytic\lbo\edp\l-min-aug04.doc

8.0 OTHER REQUIREMENTS, CONVENTIONS AND GUIDELINES (cont'd)

8.5 Electronic File Names and Filing (cont'd)

Use font size 8 for the file name. It should not be noticeable since it is not part of the text, but it should still be legible on the printed document.

For maximum effectiveness, reliability and security, documents and other files e.g. spreadsheets, must be prepared, developed, filed and stored in the common electronic work folders for your group, which are on the LAN. There are two important reasons for this requirement. Firstly, the current files must always be accessible to the whole team. Secondly, the LAN is automatically backed up, so in theory, it ought to be more reliable than other devices. Nevertheless, all files must also be backed up.

Documents and other files must be backed up onto your hard drive or onto CD or memory stick (jump drive). This is especially important when the document is being developed, to ensure that work is not lost.

As a minimum, a hard copy must be filed in the Outgoing Correspondence Folders for your group, and in the work file for the job.

9.0 REFERENCES

The references used in the development of this Technical Writing Style Guide are given below.

As indicated in Section 6.1, a good, comprehensive dictionary is an invaluable aid when it comes to written work. It can be used to check or confirm the correct spelling of words, their pronunciation, meanings and origins. Depending on the depth of the book it may also contain a wealth of other information e.g. Latin and Greek phrases, abbreviations, chemical elements and conversion factors.

A thesaurus can also be a useful source of new words and can be used to enhance one's vocabulary. It is a good tool for experienced writers but it can also be a trap for inexperienced engineers, and especially for those whose first language is not English. This is because although some words may have a similar meaning, it may not be appropriate or possible to use them in every context. For example, several years ago, one of our enterprising engineers, when attempting to describe the unit performance as good, stated that the performance during the test run was "blue riband". This was the result of the use of the thesaurus and it was clearly the wrong choice of words, but it was an interesting learning opportunity. Therefore be careful when using a thesaurus.

Probably the best single-volume dictionary of British English is the Chambers 21ST Century Dictionary.¹⁴ It's possible to search both the Dictionary and its companion thesaurus, on the Web at www.chambersharrap.co.uk but there is really no substitute for having a hard copy to hand. Moreover, the very action of searching for a word and having to look at other words and subjects is instructive in itself and a great learning activity.

The Chambers Thesaurus¹⁵ is an excellent reference, but probably the most traditional, well known and most comprehensive thesaurus is still Roget's Thesaurus.¹⁶

The Chambers 21ST Century Dictionary also includes information on abbreviations and acronyms, but a more extensive and up-to-date listing may be found on the web at www.acronymfinder.com.

The references used in this style guide are:

1. Hughs, B. (General Editor), Drury, J., and Barrett, M., "The Penguin Working Words", Penguin Books Australia Ltd., 1993, ISBN 0140513515
 - a. pp 78 – conventions for the use of brackets
 - b. pp 159 – conventions for dates
 - c. pp 171 to 175 – general discussion of desktop publishing including the importance of readability, white space, headings, avoidance of mixtures of different font types and large slabs of sanserif text
 - d. pp 229 – definition and discussions of fonts
 - e. pp 298 – description and application of justified and unjustified text
 - f. pp 531 to 534 – technical definitions and review of type faces, fonts and different formats
 - g. pp 564 to 565 – the importance of word spacing
 - h. pp 293 – the use of italics
 - i. pp 504 – the meaning and use of "status quo"
 - j. pp 211 – the use and value of the abbreviation "etc."
 - k. pp 158 – conventions for, and comments on, the use of dashes
 - l. pp 514 – tautology
 - m. pp 386 – page numbering conventions

9.0 REFERENCES (cont'd)

2. Peters, P., "Australian English Style Guide", Cambridge University Press, 1995, ISBN 0521576342
 - a. pp 410 – the use of italics
 - b. pp 184 - convention for dates
 - c. pp 664, 685 - roman type face and serif fonts
 - d. pp 683 – sentences and style
 - e. pp 254 – the meaning and use of "et cetera"
 - f. pp 563 – the use of brackets
 - g. pp 405 – the etymology, conventions, and practicalities of 'ise/ize' endings
3. Eszes, R., "Communicating Your Message Effectively", Engineering Dimensions, July/August 1994, pp 25-26
4. Boland, A., "Got Report-O-Phobia?", Chemical Engineering, March 1996, pp 131-132
5. Bly, R.W., "Avoid These Technical Writing Mistakes", Chemical Engineering Progress, June 1998, pp 107-112
6. DiGregorio, K., "Pick Up the Pace of Your Writing", Chemical Engineering, December 1991, pp 117-122
7. "Communication and Working Effectively", issued 20 October 1999 by TSD Catalytic Processes Section, prepared by G.M. Lilburne, S. Soydaner and S. Hamza Alawi
8. Venables, J. (editor), "Communication Skills for Engineers and Scientists", Third edition, 2002, published by the Institution of Chemical Engineers
9. Hunt, E., "The New Rules of Effective Communication", Engineering Dimensions, November/December 1997, pp 30-31
10. Truss, L., "Eats, Shoots & Leaves – The Zero Tolerance Approach to Punctuation", 2003, published by Gotham Books (Penguin Publications), ISBN 1-592-40087-6
11. Nadziejka, David.E., "Make Your Writing Stand Out", Chemical Engineering, August 1989, pp 147-152
12. "Fowler's Modern English Usage", second edition (1983), revised by Sir Ernest Gowers, pp 72, on the use of capital letters, and pp 314, covering the -ize and -ise endings in verbs, origins, preferences and practicalities
13. Mackay, D. "Writing for Engineers: A Guide to the Preparation of Technical Reports and Theses", Department of Chemical Engineering and Applied Chemistry, University of Toronto, 1992, (<http://chem-eng.utoronto.ca/~writing/index1.html>)
14. "Chambers 21ST Century Dictionary", second edition, 1999, ISBN 055014210X, ISBN-13: 978-0550142108
15. "Chambers Thesaurus", new edition 2004, ISBN 0550100679, ISBN-13: 978-0550100672
16. "Roget's Thesaurus of English Words and Phrases: 150th Anniversary Edition," Edited by George Davidson, 2006, ISBN 0141004428, ISBN-13: 978-0141004426
17. ISO 1000:1992 – "SI units and recommendations for the use of their multiples and of certain other units" and AS ISO 1000 – 1998, "The international system of units (SI) and its application", see examples in Section 5.2, and Annex B, which infer that multiples of 1000 should be separated by a space rather than a comma, but note that the Standards use a comma rather than a full stop for the decimal place

Note

The sentence in §6.1d should be punctuated as follows: "That, that is, is, that, that is not, is not."