Caterpillar Fundamental English

a basic approach for multi-nation technical communication in an industry

C.A. Verbeke

Caterpillar Tractor Co. is a large manufacturer of earthmoving equipment, engines and lift trucks. Total annual sales exceed $2 billion and export sales account for about 50 per cent of the total.

Like all exporting enterprises, Caterpillar Tractor Co. has experienced a need to communicate with non-English speaking dealer service personnel.

The communication problem is compounded because today's equipment has reached a degree of design sophistication that makes it difficult for even an experienced English speaking serviceman to rely solely on retained skills and knowledge. To maintain these modern machines he must frequently use detailed reference material. An additional factor is the constant revision and update of specifications and procedures that are needed to keep publications current with the products.

50 Languages Involved

Caterpillar Tractor Co. has maintained a policy of providing complete parts and service information for current and non-current production. With more than 20,000 different pieces of literature available to meet the needs of Caterpillar users, the challenge of service publications is monumental in printing volume and dollar cost. To summarize the problem: There are more than 20,000 publications that must be understood by thousands of people speaking more than 50 different languages.

Service Publications Division of Caterpillar Tractor Co. is responsible to meet this challenge. It writes the technical information, and translates a sizeable portion of English publications into four primary languages: French, German, Spanish and Portuguese. Caterpillar subsidiaries outside the United States and dealers located throughout the world translate selected publications into additional languages. However, a significant percentage of the worldwide dealer service network is still without servicing and maintenance information in its native language.

Translation Difficulties

The expense of translating all publications into 50 languages is prohibitive; over one million different publications would be required. Also, technical translators are not always available. It is apparent that the translation challenge requires a different approach to provide information that can be understood by non-English speaking persons.

Initially, Caterpillar Tractor Co. looked at existing language systems such as "Basic English", by Ogden. A system designed by the British in 1936 to simplify communications with colonial territories was not satisfactory for technical usage. Some dealers proposed the adaption of Esperanto, an artificial international language, but it also lacked the required characteristics.

Caterpillar Fundamental English

After considering and rejecting the existing systems, Caterpillar Fundamental English was developed. The basic concept is this:

1. If international language experts agree that 850 words (in Basic English) can be taught to anybody, it should not make any difference what words are used.

2. Once the particular field of communication is well defined, the needed vocabulary can be selected to fill that communication need.

3. Whatever can be illustrated (by photos, diagrams, charts, symbols, etc.) need not be included in the written vocabulary. An illustrated Parts Book, for example, obviates the need to teach any parts nomenclature or tools.

4. The fundamental vocabulary need not be taught as a complete

language. Visual recognition of the words, e.g. "READING and UNDERSTANDING" is all that is needed to communicate.

5. Last, but more important: The language usage must be structured very simply so that the audience understands a complete sentence composed of words from the fundamental vocabulary.

In its practical application, Caterpillar Fundamental English is designed to communicate service instructions only. For the serviceman to understand these instructions, he must have the following prerequisites:

1. He must be able to read and write a language.

2. He must be a trained mechanic.

3. He must have worked on Caterpillar products for at least one year.

4. He must have an illustrated Caterpillar Parts Book for the product.

5. He must have completed the course in Caterpillar Fundamental English (30 lessons).

With these prerequisites, he will be able to identify the component, or part on the machine. Then, with an understanding of the fundamental vocabulary, he will be able to read and understand the written instructions.

Correct, Simple English

This mechanic does not need any knowledge of proper pronunciation, nor grammar, or words like "babies, apples, milk, or house." With a knowledge of Caterpillar Fundamental English, he could not talk to his wife in English. At least, this is not the goal of this language system. However, if and when this man would like to advance his knowledge of English, he will find that everything he learned is *correct, simple English*. This requires special emphasis: **The English language is not distorted or changed to something artificial by Caterpillar Fundamental English.**

One of the outstanding advantages of this system is that it permits the printing of *one single version* on any given service publication for immediate worldwide use. This reduces production cost, and eliminates the possibility of translation errors. It makes multiple printings unnecessary, and expedites the distribution of information.

Caterpillar spends $150,000 annually for printing and typesetting of Service Manuals in the English language. For each version produced in another language, at least the same cost plus the cost of translating would apply. Under the new system, all that is needed is one version in Caterpillar Fundamental English.

Selection of Vocabulary

Any limitation or reduction of the vocabulary of a living language leads to compromises. The main points of consideration during the process of selecting the fundamental vocabulary were:

1. Clear definition of the subject field of communication, in this case the service, repair, testing, adjusting, and operation of equipment, engines and systems. Only words needed to describe these operations were included.

2. Each selected word must have one meaning only, and must be used as one form of speech only. Double meanings would be confusing. Example: Right is the opposite of left; correct the opposite of wrong.

3. Wherever possible, the most international form of a word should be selected. This will help to memorize the vocabulary. Example: "Assistance" is better than "help."

4. Reduction of the number of verbs in favor of nouns. This avoids irregular verb forms. As a result, we would rather say: "Make an alignment" than "align". A few simple verbs in combination with nouns make understanding easier.

5. Elimination of all words that duplicate the meaning of others. This reduces the vocabulary. Example: "Below, under, underneath, beneath." All have a similar meaning. All but "under" were eliminated.
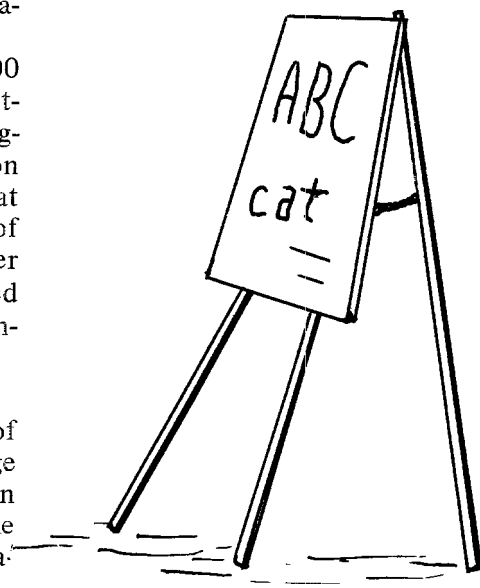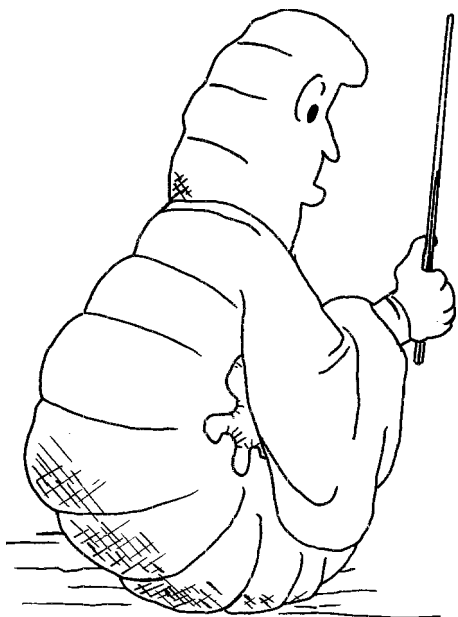
6. Since the language will be used by English-speaking personnel too, it should not be awkward. Example: "Make a grind" or "Make a tilt" is too awkward. So, the verbs "tilt" and "grind" were retained.

To actually select the needed words in the fundamental vocabulary, samples of all types of past publications were read and analyzed. Long lists of words, classified as nouns, verbs, adjectives, and small words were extracted. Then, words with similar meanings were eliminated by selecting the most generally acceptable form. Next, sample sentences, specifications, and whole paragraphs were rewritten to prove or disprove the need for a certain word. Again, some adjustments were made to avoid awkwardness.

Finally, the number of words in the vocabulary were counted. The result: *800 words*. There was no attempt to aim for a certain number during the selection process. Today, after one year of testing, the number is still 800 words for Service and Parts publications.

The breakdown of the Caterpillar Fundamental English Vocabulary is:

450 terms and things (nouns)
70 actions (verbs)
180 Characteristics (adjectives)
100 "small" words (articles, pronouns, prepositions, numbers, etc.)
800 words total

Simplification of Language Use

To achieve the goals of worldwide communications without translations, the writer's use of the English language had to be drastically simplified.

Based on the fact that the audience was well identified, and that the type of information involved was controlled by the product, the complicating factors of our present-day technical English could be determined. These are the 10 primary reasons for confusion and misunderstanding:

1. Long and complicated sentences.
2. Too many subjects in one sentence.
3. Too many nouns and descriptive adjectives in a row.
4. Too many different sentence structures.
5. Complex and compound past and future tenses.
6. Irregular verb forms.
7. Inconsistency of nomenclature.
8. Abbreviations, contractions, and colloquialisms.
9. Inconsistent or wrong use of punctuations.
10. "Fog" in expressions.

To eliminate, or to reduce the effect of, these problem factors, detailed guidelines with examples were prepared for the writers. By following these writing instructions, remarkable changes in the finished copy became apparent:

• All statements are very positive and clear.
• The language becomes repetitive at times.
• General explanations become more detailed, more step-by-step.
• Sentences are short.
• There are no implied meanings.
• The sequence of statements substitutes for past or future forms.
• There is improved consistency in style, expressions, nomenclature, and spelling.
• There is uniformity in dimensions, references, notes, etc.

All these changes are most desirable for the improvement of technical communications, and are virtually unavoidable with the use of Caterpillar Fundamental English.

A writer who adheres to the fundamental vocabulary and to these guidelines has to write clear, concise copy. While all previous

attempts to remove technical writing "fog" failed, or didn't last long, the discipline of this system succeeds. Here is one example: We cannot say: "The endplay should not exceed .005 inch." Now we say: "The maximum endplay is .005 inch." Or: "Unless otherwise specified, all lifting procedures of heavy objects must be accomplished with the aid of a lifting beam." Now we say: "Lift heavy objects with a lifting beam only."

Implementation

In July 1971, Caterpillar Fundamental English was introduced to all technical writers assigned to write dealer-directed service publications. A "Writer's Kit" containing the vocabulary, guidelines, and sample rewrites, was given to approximately 85 writers. This was followed by a detailed presentation, first to the editors and supervisors, then to the writers. After an initial period of trial and error, followup meetings were held with individual sections and writers that were encountering special problems.

Simultaneously, coordinating committees began working on new style forms for the various publications. This included terminology in specifications, spelling of dimensions and measuring units, footnotes, callouts, glossaries, and technical terms.

After three months, the groundwork was completed. Copies of the first printed service literature marked "Caterpillar Fundamental English," for identification, were distributed.

This was done without an announcement of the change. The intent was to see the unbiased reaction to the new writing form. There was no reaction. The English remained *so much English* that the difference was not detectable.

Once the announcement was made, the reaction was overwhelmingly positive, especially in regard to Service Training material.

There is one interesting side benefit to the simplification of technical English: In order for a writer to explain an operation or procedure in simple terms, he must understand it completely. This means that with each assignment, he grows in technical proficiency as well as writing ability.

Teaching the Fundamental Vocabulary

A special Language Training Course was developed to teach the Caterpillar Fundamental English Vocabulary to the service and parts personnel of dealers in non-English speaking territories. The training package consists of the following material:

1. An *Instruction Manual* for Caterpillar Fundamental English. This covers the 800 words of the fundamental vocabulary. The words are grouped by related subjects into 30 lessons, each consisting of 25 to 35 words. Following the introductory notes to the instructor is a list of the words for each lesson on the left hand page, with space for the translation of the words beside it. On the right hand page illustrations, examples and explanations are given for each word. At the end of the manual, the complete vocabulary is added.

2. A *Caterpillar Basic Product Nomenclature book*. This book contains illustrations of types of machines, engines, attachments, undercarriage and chassis components, bearings, seals, common fasteners, and pictures of hand tools. There are callouts and spaces for translations of the part designations.

The content of this book is not taught in classes. It is strictly a picture book for self-study and reference and is designed to supplement the standard Parts Book.

3. A *Pocket Reference Booklet* for Caterpillar Fundamental English. This is a pocket-size dictionary listing all words of the fundamental vocabulary, the Basic Product Nomenclature, the tools, as well as shop materials, units of measure, parts of the human body (for safety purposes) and other data, in alphabetical order, each with space for the translation. It is designed to be carried for quick reference.

These books are copyrighted by Caterpillar Tractor Co.

Instructor Qualifications

The instructor for the language course must be selected locally by the Caterpillar dealer, since he must have a working knowledge of English in addition to the native language. As an employee of the dealer, he will also be acquainted with Caterpillar product terminology, and the commonly used translations of machine parts and component names.

In addition to these training publications, *A Dictionary* of Caterpillar Fundamental English is provided for the instructor. This dictionary gives definitions, in English, for each word of the fundamental vocabulary.

It helps the instructor to determine the exact meaning of the word before he gives the translation to the students; for example: Drop (noun) = a quantity of fluid that falls in one spherical mass. (Drop is not used as verb for "falling", or as a "drop in pressure".)

A lengthy "Introduction to the Instructor's Notes" outlines the concept of Caterpillar Fundamental English, and enumerates several methods of teaching the course, scheduling classes, selection of student groups, and evaluation of progress. There are tests for use after completion of 10 and 20 lessons.

Classroom Training

Basically, the training in the classroom follows this procedure:

1. The instructor translates each word covered by the lesson into the native language and defines the word or term.

2. The students write the translation for each word in this lesson. No pronunciation attempts are made.

3. The instructor, using the illustrations or examples on the right hand page of the manual,

gives several actual examples of the word's usage. The students start reading and understanding simple sentences made up from the vocabulary on hand.

4. As homework, the student transfers the new words from the lesson manual to the alphabetic list in the Pocket Reference Booklet. At an advanced stage, translations of actual paragraphs from service literature might be included.

At no point of the training process is the student asked to write or speak English, although this is an option of the instructor.

At the end of the course, the Pocket Reference Booklet will contain an alphabetic listing of each word in the vocabulary as well as the translated term in the serviceman's native tongue.

Serviceman Qualifications

After completion of the course, a serviceman should be able to follow the instructions written in Caterpillar Fundamental English, to perform all service operations including testing and adjusting procedures and the selection of tools and parts.

This language training program is currently in use at our dealers in Singapore, Indonesia, Mexico, Spain, Israel, and the Zaire Republic. The results are extremely encouraging, and the dealer response is enthusiastic.

Application to Other Fields

To get the full benefits from this language system, something like a "Closed Circuit" must exist between the writer and his audience. The writer must adhere to the vocabulary and nomenclature which the serviceman has learned. This "closed circuit" concept is most important.

This basic principle can be applied to technical literature for any field of industry. For example: A check-out procedure for aircraft. The instructions come from the manufacturer, regulatory agency, or the airline. Technicians worldwide learn the manufacturer's selected vocabulary, and as a result, aircraft can be checked out by any mechanic who can "read and understand" that particular vocabulary.

Universally Understandable

The English language reader also benefits from this system because he receives his instructions at a more universally understandable level. This especially applies to ethnic groups with a limited command of technical English.

In summary, the theory of Caterpillar Fundamental English is widely applicable, and all indications are that this language system might soon spread into other fields and applications. The vocabulary for each case will have to be structured to match the subject matter. The technical writer must accept the discipline of limited word usage, and his audience must be willing to spend the time and effort to learn the selected vocabulary. Beyond these prerequisites, there is no limit to the use of the Fundamental English concept.

Charles A. Verbeke is manager, service training, general offices, Caterpillar Tractor Co., Peoria, Ill. He has served the company in the United States and in formerly Belgian Congo, now Republic of Zaire where his main responsibility was training the natives to fill jobs previously held by expatriates. He has also worked as service training manager for Caterpillar Co. in Geneva, Switzerland where he assumed the responsibility for training Caterpillar personnel for Europe, Africa, the Middle East and the Far East. Born in Belgium, his language experience has helped in developing the concept of Caterpillar Fundamental English. He attended the University of Bridgeport, Bridgeport, Conn.