

DOCKETED

UNITED STATES OF AMERICA
 NUCLEAR REGULATORY COMMISSION

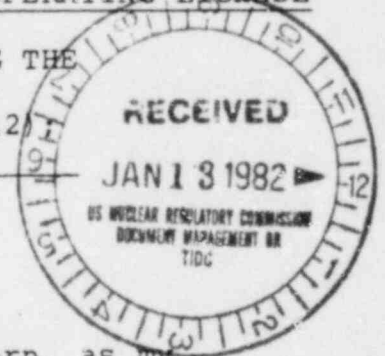
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ATOMIC SAFETY AND LICENSING BOARD

In the Matter of :
 :
 CINCINNATI GAS & ELECTRIC : DOCKET NO. 50-358
 COMPANY, et al. :
 (William H. Zimmer Nuclear :
 Power Station) : APPLICATION FOR AN OPERATING LICENSE

DIRECT TESTIMONY OF RICHARD ARTHUR ADDRESSING THE
 ZIMMER AREA CITIZENS-ZIMMER AREA CITIZENS OF
 KENTUCKY AND DAVID FANKHAUSER CONTENTIONS 4(12)
 23(4) and (5).



State of Ohio)
) SS:
 County of Butler)

Richard Arthur, being first cautioned and sworn, as my
 testimony state as follows:

My home address is 978 Columbia Road, Hamilton, Ohio 45013.
 I hold a Bachelor of Science degree in education and a Master of
 Arts degree in English from Bowling Green State University, Bowling
 Green, Ohio. My professional experience includes, from 1963 to 1965,
 graduate assistant in English, Bowling Green State University,
 Bowling Green, Ohio, teaching freshman English and remedial English;
 from 1965 to 1966, Wayne State College, Wayne, Nebraska, teaching
 freshman English and English Literature; from 1966 to 1968, Ohio
 Northern University, Ada, Ohio, instructor of English, freshman
 English, American Literature; from 1968 to 1972, the University of
 Cincinnati, Cincinnati, Ohio, instructor of English, 1968 to 1972,
 assistant director of freshman English, 1970 to 1972; 1972 to the
 present, head, Department of English, William Henry Harrison High

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School, Harrison, Ohio, director, 1972 to 1974, Title II reading project. Additional professional experience: from 1971 to the present I have appeared some fifteen times as an expert witness in litigation, both in the federal and state courts. My testimony has been on contemporary community standards, literary values and readability of material at issue in these various cases. From 1972 to 1974 I was Title II reading project director. I implemented a program designed to establish and improve the reading skills of high school students. The program was founded on the assumption that reading problems occur because of poor vocabulary and lack of interest, which is caused by material too difficult for the student or the reader to handle. Publications: Clifton Magazine, winter 1974, "The Victorian Backlash".

The analysis of "Circle of Safety" was given four tests. The first test is called the Fry Readability Test and the results were plotted on Fry's readability graph. The second test was a vocabulary level test. The third test was a structural or organizational test. The fourth test was an analysis of the effects of the handbook "Circle of Safety", followed by conclusions regarding these various tests.

First, the Fry Readability Test. The Fry Readability Test involves an analysis of three 100-word passages selected at random. These passages were selected from page 5, page 9 and page 14. The total number of sentences in each 100-word passage is counted and then the three passages are averaged to come up with an average number of sentences per 100-word passage. The average for the three

samples taken from "Circle of Safety" is 4.6 sentences per 100-word passage. The second part of this test is the counting of the number of syllables for each passage. For example, the word "cat" has one syllable, the word "blackboard" has two syllables, the word "continental" has four syllables. The number of syllables is determined from each vowel sound in a word. Proceeding thus with the three samples, the sample on page 5 has 175 syllables; the sample on page 9 has 189 syllables; the sample on page 14 has 168 syllables. These are then totaled and averaged to come out with an average number of syllables per 100-word passage of 177 syllables. These two conclusions — the 4.6 sentences and the 177 syllables — are then plotted on Fry's readability graph, which gives an approximate grade level of the readability of the material under examination. My conclusion, based on this analysis, is that the material is greater than college level reading. The meaning of this is that people with a college education would be likely to have difficulty in understanding the material contained in the "Circle of Safety". People with less than a college education would have considerable difficulty understanding the material contained therein.

The second test is the vocabulary test. This test is based on the assumption and recognition that a vocabulary level which is too high for the average person to grasp easily creates difficulty for the reader. Thus, the reading soon becomes dull. A person is not likely to read the book because he will become bored by it, or can not understand it. While it is true that a person might figure

out the meaning of a particular vocabulary word from context, the interest level of this material is so low that a real effort to find meaning is not likely to occur. Also, if there is a real need, frustration from the lack of understanding of the material is likely to cause panic in the reader. Approximately 157 words and phrases, some of which are used more than once, are indicated in the text as being of sufficient difficulty to cause a lack of understanding or frustration in the average reader.

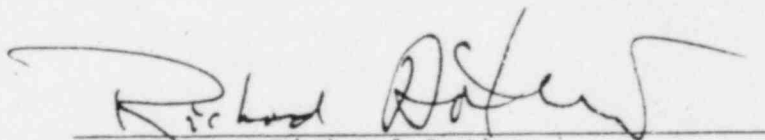
The third test involves structure and organization and is based on three principles. The first principle is that in any reading the interest of the reader declines as the reading proceeds. The second principle is the location in the handbook of valuable information. The third principle is the ease of location of important material. With respect to the first principle, interest declines as a person reads. The material being read must counteract that declining interest. In the "Circle of Safety" it is unlikely that many readers will get to Section IV, the most crucial part of the handbook, because the first three sections are either too dull or too difficult. With respect to the second principle, the central value of this handbook is buried at the end. The end is the least likely place the reader would get to because of the readability factor and is the least likely place a reader would look for valuable information. With respect to the third principle, a handbook should give specific information quickly, accurately and simply. For example, a telephone book or the yellow pages or the dictionary uses the principle of alphabetical order. Anyone knowing

the principle can use the book easily. In spite of the ease of using a telephone book, however, many avoid the work involved. Thus, we have to pay for more than three directory assistance calls per month. This example shows that people are not likely to use handbooks which are relatively easy and, by implication, not likely to understand or be able to use handbooks such as this which are quite difficult.

The fourth test involves the effects of the handbook as it is now written. The first effect, as I see it, would be confusion for the readers. The purpose of this "Circle of Safety" is cloudy. Throughout Part I, Introduction, Part II, Radiological Emergencies, and Part III, Radiological Planning, there is frequent reference to the likelihood that there will never be a significant emergency, or that the emergency won't be important enough to involve the public. The intention seems to be to keep the reader calm, but that attitude contradicts Section IV, Notification and Protective Actions. The likely result is confusion. Should the reader worry or not? What should the reader do if he is worried? The place for editorials on how safe the plant is, and the place for assurances that the power company/government complex is interested in safety, is not in the handbook on what to do in case of emergencies. The second effect, the visuals presented in the left hand margins are inadequate. Some visuals do not clearly illustrate the points because of the vocabulary on the visual or what it is trying to depict: page 2, "engineered safeguards"; page 3, "cooperative interplay", page 4, state county organizations;

page 5, "alpha, beta, gamma rays"; page 9, the first visual; page 11, "neighborhood cooperation"; page 12, bags packed; page 13, both visuals.

It is my professional opinion that the "Circle of Safety" is a failure in five ways. First, it can not be read or understood by the audience to whom it is presumably aimed, an audience, based on my experience, which is likely to include people who have a reading ability from the third grade through the college level. Second, the vocabulary in the book is too sophisticated, which creates a lack of reading interest and, therefore, frustrates the audience. Third, the book is poorly structured. The worthwhile information is hidden under jargon, bureaucratic acronyms, condescension and editorializing. Fourth, the book is boring and confusing in its effect. And, finally, the audience won't or can't read the book, therefore the audience is not likely to take the matter very seriously. The audience can not respond to an emergency because it has not really received the communication. The medium, after all, is the message.


Richard Arthur

Sworn to and subscribed in my presence this 7th day of January, 1982.



MAXINE S. LOUX
Notar Public, State of Oh
My Commission Expires Jan. 29, 1985