Book Reviews

Techniques in Fast Reactor Critical Experiments. By W. G. Davey and W. C. Redman. Published under the direction of the American Nuclear Society for the Division of Technical Information, U.S. Atomic Energy Commission. Gordon and Breach Science Publishers, New York (1970). 314 pp. $20.40.

Within only a few years we have seen reactor-physics instrumentation and data reduction change from art to technology. The associated surge of experimental sophistication has led to the payoff of fast-neutron techniques such as proton-recoil spectrometry, which some of us had believed too complex for practical return. It is the ideal time to review these remarkable techniques and to fit them in with the older, more prosaic experimental methods, as Davey and Redman have done.

The authors say that their *Techniques in Fast Reactor Critical Experiments* is directed toward reactor physicists with extensive experience in the development of thermal reactors. Their presentation builds upon such a background, gives only those experimental results required to indicate quality of measurements or to provide some comparison with analysis, and generally paints a broad-brush picture of techniques. They include abundant references expected to satisfy the reader who wants complete data or experimental detail.

Because of these restrictions, *Techniques in Fast Reactor Critical Experiments* is neither textbook nor desk-top reference. But it should be no farther away than the technical library. One reading is recommended for the student or professional who wants to review current practices, and the book should be available to each nuclear engineer or reactor physicist as an excellent source of references. The range of topics is expressed well by chapter headings: Physics in Fast Reactor Design, Design of a Fast Critical Facility, Critical Mass Measurements, Substitution Measurements, Fission and Capture Measurements, The Sodium Density Coefficient, Doppler Coefficient, Kinetics and Control, Neutron Spectrum, Spectral Indices, Reactor Design Problems, and Trends in Critical Facility Operation.

Somewhat expanded discussions could have accommodated readers who like to understand the significance of results while quality is being demonstrated. There might have been a little more explanation with tables and graphs (something to bolster serial numbers such as ZPR-6 Assembly 5), a little more help with a strange concept like reactivity worth of an added neutron source, and a little less reliance upon references for things such as a definition of the sandwich-foil technique. But to point out these minor manifestations of the authors' self-imposed restrictions is not to complain about them. Neither is it a complaint to point out examples of controversial opinions: that it is not yet feasible to match the detail of many-group diffusion calculations by means of Monte Carlo, and that reactivity coefficients are used as indicators of capture cross sections only for fissile materials. Some controversy can ward off dullness.

I wish this review might end here, but there is further commitment to our readers, especially to prospective authors of other monographs. *Techniques in Fast Reactor Critical Experiments* has a defect that is becoming too common in technical publications—it reads like an early draft instead of the finished work. Although there appear to have been adequate reviews for technical content and for type-setting errors, there is little evidence of the essential intermediate step—editing for sense and style. Where competent people like Davey and Redman slip, as well as competent organizations like ANS and AEC, there must be a lesson for each of us.

The introductory chapter (Physics in Fast Reactor Design) has content, but mostly as a collection of dissociated paragraphs—as though the authors were committed but their hearts were not in it. The immediate poor impression that this creates is unfortunate, because the rest of the book is coherent.

Editorial oversights occur in all chapters, often enough to upset even the speed-reader. It is only human, especially in dictation, to say things ungrammatically (". . . validity and accuracy . . . is unresolved"), obscurely (". . . it is probable that the uncertainty . . . is unlikely to be less than 0.5%"), redundantly (". . . the observed power history is observed . . . ," also the heading "Illustrative Examples"), and inelegantly (". . . measurements were not made in the . . . studies made prior to . . . "). It is not demeaning to expect these faults (as well as inconsistent notation and careless labeling), to search them out, and to correct most of them before publication. Yet we technical people tend, for the slightest excuse, to skimp on writing, whether a result of overcommitment, conceit, or boredom. Maybe we need the help of pros like the Columbia University historians, Barzun and Graff (*The Modern Researcher*, Harcourt, Brace, & World, Inc., New York, 1957):

> But having written such sentences, the man who is going to thrust them on someone else's attention has a duty to make them more intelligible and attractive. He must try to read them with the eye of another, see their faults, and correct them. This obligation defines one of our principles: except for those who compose slowly in their heads before setting down a word, *no one, however gifted, can produce a passable first draft.* WRITING MEANS RE-WRITING.

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About the Reviewer: Hugh Paxton has been responsible for the program of critical experiments at the Los Alamos Scientific Laboratory for more than two decades and has been active in other aspects of the nuclear energy program since the early 1940's when he was a member of the team which first concentrated the uranium isotopes by gaseous diffusion. He is a member of the U.S. Atomic Energy Commission's Atomic Safety and Licensing Panel and of the Editorial Advisory Committee of Nuclear Science and Engineering.