BOOK REVIEW

Selection of books for review is based on the editor's opinions regarding possible reader interest and on the availability of the book to the editor. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.

Anticipated and Abnormal Plant Transients in Light Water Reactors—Volumes 1 and 2

Editors Pamela L. Lassahn, Debu Majumdar, and George F. Brockett

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Reviewer Arthur E. Bergles

These volumes are the hardcover proceedings of the American Nuclear Society Topical Meeting on Anticipated and Abnormal Plant Transients in Light Water Reactors, held September 26-29, 1983, in Jackson, Wyoming. The primary dedication is to George Brockett, program chairman for the meeting, who passed away March 17, 1984. Mr. Brockett is remembered for his dedication to technical excellence and outstanding, pioneering contributions to the nuclear power industry.

This first topical meeting on the subject brought together a large group of participants from the nuclear industry, regulatory agencies, national laboratories, and academia. The coverage was very broad, in recognition of the complex multidisciplinary nature of the problem: nucleonics, fluid flow, heat transfer, control systems, safety systems, operator actions, maintenance, management, and economics. Sessions were arranged to cover the experience base, anatomy of significant events, applications of both deterministic and probabilistic methods, man/machine interface, and plant transient management. The basic intent was to follow the advice of banquet speaker Joseph Hendrie: "The essentials of transients management are first, to see where the machine is going, and second, to plan ahead."

These volumes are characterized by author-prepared manuscripts that are of better-than-average quality for such international proceedings. Each of the 18 sections begins with a succinct, but informative summary of the papers contained therein. The order of the papers is not entirely logical, but the informed reader can easily get to the desired information. In some cases the detail is sparse and no references are cited. However, full addresses of the authors are provided in most cases so that direct contacts can be made for further information. A transcription of most of the discussion that followed each set of papers is included. These discussions are difficult to follow because of their terseness, lack of upfront identification of the person being questioned, and a malfunctioning typewriter. The remarks are, however, valuable for their candor.

This reviewer found the papers dealing with actual incidents to be more interesting than those addressing the hypothetical "what if's." This aside, very good summaries of important areas, such as the current state of the codes, are given. The foreign papers add an important dimension to the science and art of code development and assessment.

The pressurized water reactor and boiling water reactor "learning curves" presented on p. 955 are particularly interesting. They indicate a significant decrease in the transient (scram) frequency with increasing plant age. The curves seem to be bottoming out, however, and one cannot help but wonder if the traditional bathtub curve will not eventually show up.

The meeting and these proceedings must be considered to be within the wake of Three Mile Island Unit 2. A truly significant response to that accident is evident. The accident demonstrated that operators play an important role in determining the course of a transient event. It is thus appropriate that a large group of papers addresses transient management, particularly operator reactions and computer support of operators. The development of fast-running codes suitable for minicomputers is particularly encouraging.

Section 18 is an attempt to distill the essence of the papers as well as the question-and-answer periods. There is much duplication of the chapter summaries and a heavy dose of the summarizers' opinions that could not be elaborated on in the available space. The transcription of the final discussion is also of limited usefulness.

The editors have put together some useful additional information in the appendix, including a compendium of worldwide reactor transients from 1974 to 1983, transient test facilities, nonproprietary computer codes (108!), standard problems for code validation, and a nearly complete list of

acronyms used throughout the proceedings. The index is quite comprehensive and generally useful in locating discussion on specific topics.

Considering the massive effort that is continuing in nuclear safety, these proceedings must be considered a snapshot of a point in time, now more than four years ago, with the papers essentially representing progress reports. However, the lasting impact of the conference was to speed the development of a worldwide data base on plant transient experience. As this data base and the resultant expert systems develop, the industry is indeed better able to prevent and cope with plant transients. By any standards, these volumes represent an archival reference that should be familiar to anyone working with light water reactor plant transients. They are also highly recommended general reading for anyone concerned with nuclear power.

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