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BOOK REVIEW

MILTON S. PLESSET, NOVAK ZUBER and IVAN CATTON (Editors), **Transient Two-Phase Flow**. Published by Hemisphere, Washington, DC (ISBN 0-89116-258-5) and distributed outside North America by Springer, Berlin (ISBN 3-540-12248-6), 1983, 736 pp., £51.85.

This book is a collection of papers presented at the third specialist meeting on transient two-phase flow organized by the O.E.C.D. Nuclear Energy Agency Committee on the Safety of Nuclear Installations held at Pasadena, California, in March 1981. Thirty-eight papers are printed divided into five sections:

Measurement techniques	6 papers
Experimental studies	9 papers
Fundamentals of transient two-phase flow	8 papers
Numerical methods	8 papers
Code application and assessment	7 papers

The papers have been reproduced directly from typescript produced by the authors: in spite of this the text and the diagrams are quite legible. The papers inevitably vary considerably in style, there is no common nomenclature (indeed the individual papers do not have nomenclature lists) and both S.I. and American units are used. There is a surprisingly good index for a book of this type, but there is little other evidence of editorial work.

Transient two-phase flow in the nuclear industry is a complex and important subject. The papers given here therefore cover a very wide range of subjects: from instrument development for use at high temperatures and pressures to detailed and rather abstract mathematical analysis. It is impossible to review all the papers in this volume, and so only a few generalizations are made here.

(1) Although advances in instrumentation techniques have been made, we are still unable to measure accurately mass flow rate, quality, void fraction and flow pattern during a transient without disturbing the flow. Probably the most promising technique, pulsed neutron activation, requires very large neutron pulses.

(2) As a consequence of instrumentation difficulties the experimental studies are often restricted to measuring variables which are of secondary interest when trying to understand the nature of the flow: thus, for example, pressure can easily be measured but a knowledge of mass flow rate would be more useful.

(3) Although there are many (too many) mathematical models of the flow, we are unable to obtain the necessary good data to test them adequately. Thus modelling of the flow is proceeding without adequate checks.

(4) Because transient two-phase flow is so important in a reactor safety case, large computer programs are necessary to obtain results for complex geometries even with simple mathematical models of the flow. In order to cope with the geometrical complexity and to reflect experimental results, these programs are now exhibiting a kind of baroque splendour.

The papers in this book demonstrate both current advances and difficulties. To anyone interested in the thermal–hydraulic aspects of nuclear reactor safety it is a book you should persuade your librarian to buy.

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