

FOREWORD

Deviations of parameters from their average values in the manufacturing and construction of cores for nuclear reactors (in other words, fabrication tolerance) lead to deviations from the average operational regime. It is important to estimate the probability of such operational deviations in order to be able to operate reactors safely, economically and reliably.

The statistical task involved here is closely related to the fuel design, cooling system and core structure design. In the application of this task, the concept of the hot-channel factor permits a quantitative estimate of the safety margin in the thermal design of fuel elements, and thereby specification of the allowable manufacturing tolerances.

The IAEA International Working Group on Fast Reactors recommended that a panel meeting on "Principles of Hot-Channel Factor Calculations" for LMFBR's be held. This meeting took place at the Karlsruhe Nuclear Centre in the Federal Republic of Germany from 22 to 24 November 1974.

The Panel discussion focused on the following areas:

1. Applied theories and mathematical methods of hot spot analysis.
2. Application to practical calculation and analysis during the reactor operation.
3. Consideration of detailed problems (analysis of uncertainties, calculation of sub-factors and limiting quantities).
4. Effect of the core design.
5. Future development.

18 scientists in the field from 8 countries and one international organization took part. Their participation reflected the internationally-wide interest of fast reactor designers and operators in the topic.

The Agency wishes to express its appreciation to the Karlsruhe Nuclear Centre for hosting the Meeting, to the authors of the papers, to all who participated in the discussions, to Messrs. D.L. Linning, N.V. Krasnojarov, and A. Amendola for guiding the individual sessions and Dr. P. Engelmann and Dr. F. Hofmann for the preparation of the Meeting.