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POLISH ACADEMY OF SCIENCES

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on *Fluid Mechanics in Machine
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TRANSACTIONS OF THE INSTITUTE OF FLUID-FLOW MACHINERY

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Aims and Scope

Transactions of the Institute of Fluid-Flow Machinery have primarily been established to publish papers from four disciplines represented at the Institute of Fluid-Flow Machinery of Polish Academy of Sciences, such as:

- Liquid flows in hydraulic machinery including exploitation problems,
- Gas and liquid flows with heat transport, particularly two-phase flows,
- Various aspects of development of plasma and laser engineering,
- Solid mechanics, machine mechanics including exploitation problems.

The periodical, where originally were published papers describing the research conducted at the Institute, has now appeared to be the place for publication of works by authors both from Poland and abroad. A traditional scope of topics has been preserved.

Only original and written in English works are published, which represent both theoretical and applied sciences. All papers are reviewed by two independent referees.

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Preface

In the present edition of Transactions of IFFM enclosed are the papers submitted to the National Seminar on Fluid Mechanics in Machine Construction and Exploitation, which will take place in Sopot on 21st May 2002.

The idea of the seminar arose in the society of persons employed at the Institute of Fluid-Flow Machinery of PAS as well as the University of Warmia and Mazury in Olsztyn, who are involved scientifically and professionally with the fluid mechanics and well as to some degree with the construction and exploitation of machinery.

That initiative is put forward in the light of contemporary integration tendencies between traditional branches of science. The differences between for example tribology, diagnostics, safety and reliability of machines become less and less marked. The same situation is present in the area of design and exploitation. More and more often discussed is the problem of exploitation orientated design, whereas the philosophy of co-current design is very much favoured these days, which is focused on the product maintenance after its selling and at the same time focused on the market and social processes.

Many scientists and engineers started their career in the disciplines closely linked with fluid mechanics and then continued their development designing various machines and equipment. Such tendency can be regarded as fully natural and even induced by the contemporary development of technology and computer sciences. Fluid mechanics founded mathematical and numerical basis for the description and identification of models of various kinds of phenomena, which are subsequently widely used in machine construction and exploitation. Mentioned here can be works from the area of turbulent flows, cavitation, hydraulic jump or even from the area of hydrodynamic theory of lubrication. Results of fundamental works, regarding these topics and conducted in the frame of fluid mechanics, have been directly implemented in the process of design, construction and exploitation of for example machines and systems in power engineering, ma-

rine propellers, district heating pipelines or the bearing nodes of various kind of machinery. There are obviously many more examples of such kind of relations.

The Seminar organisers dedicate that first integration meeting between the representatives of both disciplines to Professor Eustachy S. Burka on the occasion of 50th anniversary of his scientific and professional career. Professor E. Burka, however, usually linked with fluid mechanics, has also very significant achievements in the machine construction and exploitation. Therefore he can be regarded as the scientist with interdisciplinary interests. He combines also two scientific societies from both institutions, i.e. the Institute of Fluid-Flow Machinery in Gdańsk and the University of Warmia and Mazury in Olsztyn.

Jan Kiciński
Editor