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Foreword

Ladies and gentlemen,

It has been 5 years since our University had the honour of organising the International Conference on Engineering Education (ICEE 99) on the occasion of the one hundred and fiftieth anniversary of the foundation of the VSB-Technical University of Ostrava. It is to our credit that the iNEER (International Network for Engineering Education and Research) has put our University again in charge of organising another meeting for the iNEER's community members, namely the International Conference on Engineering Education and Research, iCEER-2004. The fact that the iNEER community amounts to almost 20.000 members testifies to the accuracy of the idea of founding this international institution as a family of engineering teachers, researchers, and students. It is their qualities that represent moving forces of innovation and technological development, which in their consequence decide about our sustainable commonwealth.

Perhaps some of the iCEER-2004 participants might be tempted to ask a question why exactly our University should be proactive in the field of engineering education and research. The major reason is provided by the fact that our region urgently needs what I would call a re-engineering of its engineering education. The region and its principal municipality are closely connected with developments of industrial revolution. Mining and metallurgy industries (Vítkovice-Steel Company) were founded as early as 1828, and they have been a decisive factor in determining the economic and social life in the municipality ever since. From a small village Ostrava, the third biggest municipality in the current Czech Republic has developed.

The transformation of the North Moravia and Silesia region asks for substantial structural change of local economies that have been fixed on coal and metallurgy industries. There is a glut of their products both in Europe and worldwide that - along with skyrocketing productivity in metallurgy and incomparably more favourable conditions in mining industries overseas - mark an irreversible trend of decreasing employment rates. In analogy to this situation, also industries of heavy machine engineering face grave difficulties as almost exclusively oriented on mining industries that are in deep trouble everywhere in Europe. The current accession of the Czech Republic to the EU will only deepen the existing predicaments as the same difficulties will also arise within the Katowice region of the neighbouring Polish Silesia, where declines of mining and primary production industries are about to effect a population of almost 5 million people.

The HEI and RTD structures in the region between 1945 and 1989 were almost exclusively oriented towards mining and metallurgy industries. Since 1990 the VSB-Technical University of Ostrava have been in the process of transformation from a higher education institution specialised in mining and metallurgy to a polytechnic and economic institution of higher education. As the only institution of its kind in the Czech Republic, our University has been setting up new technical Faculties: Faculty of Electrical Engineering and Computer Science, 1991; Faculty of Civil Engineering, 1997; and Faculty of Safety Engineering, 2002. Having a kind of a regional HEI monopoly in engineering education, our University is obliged to participate in network of international co-operation for putting its teaching and research agendas on the state-of-the-art level, which immediately concerns meeting of urgent needs of innovation and restructuring of our region. Traditions of regional industry, and positive approaches towards technical developments of the former generations oblige. A simple fact that HEI innovative capacities have yet to be fully harnessed in the Czech Republic implies necessity to learn from experience of higher education institutions abroad that experienced analogical situation in the past. This especially concerns setting-up of university research centres, and spin-off companies by universities, development of LLL structures for engineering education, IT research and development activities, and influencing public and economic policies concerning human resources for new industries and innovative activities.

Successes of transformation policies in the twenty-first century are conditioned by the quality of engineering education and its international accreditation. The iCEER-2004, and its organisers have tried to fulfil expectations of more than 230 participants. The Conference's backdrops are historically significant - Bouzov castle, as well as Olomouc municipality – and they attest to skills and workmanship of our ancestors centuries ago, which is a binding experience for all us who decide the future of Europe; the Europe to which we historically belong, and to which we returned on the first of May 2004.

I wish all participants of the iCEER-2004 well. I wish you could experience an interesting, enriching, and entertaining programme with a lot of personal contacts and reminiscences of the historical places of the Czech Republic.

Ostrava, June 2004

Prof. Dr. Tomáš Čermák
iCEER 2004 General Chair

Organization

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Key words: Engineering education, education review, curriculum review, collaboration, engineering pedagogy. INTRODUCTION Engineering and technology are critical inputs for economic development and competitiveness (Luiz et al., 2004). In evaluating the contributions of academic engi-neering research to national goals, a major question is the degree to which such research helps those indivi-duals who will, whether they join academia, industry, or government, enhance and apply the knowledge base relevant to the technical problems facing the country (Forces Shaping the U.S. Academic Engineering Re-...Â Highly technologically developed countries in the world invested so much in technological innovation through partnership with academia. Engineering education methods and standards are important features of engineering programs that should be carefully designed both to provide students and stakeholders with valuable, active, integrated learning experiences, and to provide a vehicle for assessing program outcomes. With the driving force of the globalization of the engineering profession, standards should be developed for mutual recognition of engineering education across the world, but it is proving difficult to achieve. The Handbook of Research on Engineering Education in a Global Context provides innovative insights into the i