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Pedro M. Arezes · J. Santos Baptista · Paula Carneiro · Jacqueline Castelo Branco · Nélson Costa · J. Duarte · J. C. Guedes · Rui B. Melo · A. Sérgio Miguel · Gonçalo Perestrelo *Editors*

Occupational and Environmental Safety and Health III



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Volume 406

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Occupational and Environmental Safety and Health III



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A special tribute to Béda Barkokébas Júnior and Mohammad Shariari for their remarkable technical and scientific contributions over the years. We will always miss you.

Preface

Occupational and Environmental Safety and Health III is a compilation of the most recent work of some selected authors from 13 countries within the domain of occupational health, safety and ergonomics.

This book represents the state of the art, and it is mainly based on research carried out at universities and other research institutions, as well as some on-field interventions and case studies. Due to the broad scope, relevance and originality of the contributions, it is expected that this book contains useful and up-to-date information, and it presents fundamental scientific research that is being carried out in the subject, as well as it contributes to the outreach of practical tools and approaches currently used by OSH practitioners in a global context. All the included contributions were selected based on their potential to show the newest research and approaches, giving visibility to emerging issues and presenting new solutions in the field of occupational safety, health and ergonomics.

This book is based on selected contributions presented at the 17th edition of the International Symposium on Occupational Safety and Hygiene (SHO 2021), which was held on November 17–19, 2021, in Porto, Portugal.

All the contributions included in this book were previously peer-reviewed by, at least, two of the 112 members from 16 different countries of the International Scientific Committee of the 2021 edition. The event is organised annually by the Portuguese Society of Occupational Safety and Hygiene (SPOSHO).

Editors would like to take this opportunity to thank their academic partners, namely the School of Engineering of the University of Minho, the Faculty of Engineering of the University of Porto, the Faculty of Human Kinetics of the University of Lisbon, the Polytechnic University of Catalonia and the Technical University of Delft. The editors also would like to thank the scientific sponsorship of several academic and professional institutions, the official support of the Portuguese Authority for Working Conditions (ACT), as well as the valuable support of several companies and institutions. Finally, the editors wish also to thank all the reviewers, listed below,

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