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Editorial of the 1st International Cross-Industry Safety Conference proceedings

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The Amsterdam University of Applied Sciences was proud to organize the 1st International Cross-industry Safety Conference (ICSC) dedicated to both practical and theoretical aspects of safety. The conference functioned as a platform to disseminate and share knowledge and experience about safety within and between industry and academia. The conference featured keynote speeches by Neville Stanton (Professor of Human Factors in Transport at the University of Southampton, UK), Johan Svenningsson (CEO Sydkraft Nuclear Power AB & Country Chairman Uniper, Sweden), David Lindley (Aviation Engineering and Safety Consultant, UK), and Bart Poolman (Lead QASHE Advisor for Heerema Marine Contractors, NL).

The reason to organize the conference was that there is a plethora of approaches to safety, respective models and management methods that have been proposed by the academia. Various 'best practices' are applied across industry sectors and are included in standards and regulations. The diversity of models and approaches serves the scope of science, but when it comes to practice, does not allow the establishment of a common language regarding safety. Academics focus on problems that the industry is not highly concerned with, and the industry is not knowledgeable about research results that can be used to solve safety related problems. Moreover, even best practices are not widely shared across different industries, even though safety is one of the focal points for all industry sectors. Organizations have recognized that safety improvements contribute to the achievement of broader business goals.

The ICSC proved to be a unique opportunity to bring together various industry sectors and the academia. Besides the keynote speakers, 16 delegates from various industry, academia and (inter)governmental organizations delivered their presentations and discussed with the attendants a wide range of practical applications and research results. Those speeches covered a spectrum of topics around the areas of safety metrics design, performance-based safety assessment, measuring of distances between system states, safety and efficiency, safety data sharing, future safety challenges, safety and culture, and harmonization of safety regulations. The proceedings hosted in this special issue of the Journal of Safety Studies give an indication of the breadth and depth of the conference program.

In addition to the Questions & Answers sessions that followed each presentation, a plenary discussion took place on the subject of 'What Does the Industry Need from the Academia in the Area of Safety?". This was a fruitful discussion that highlighted the need to minimize the gap between theory and practice, and invest more resources in solving real-world problems through the operationalization and testing of safety theories and models. Under this concept, the industry was prompted to become more eager in hosting respective research and the academia was urged to consider the requirement for practical, effective and efficient, yet

scientific, solutions.

Before briefly presenting the content of the papers included in the ICSC proceedings, we would like to thank professor John Stoop PhD of Kindunos Consultancy (NL) for his kind sponsorship of this first edition of this conference. We would also like to thank the organizing committee under leadership of Viktoria Balla-Kamper. Finally, we express our deep appreciation to the program committee members for their efforts to review the conference papers (in alphabetical order of last name):

- Maria Mikela Chatzimihailidou, PhD, Imperial College London, UK
- Martin Homadrka, PhD, University of Žilina, SK
- Steffen Kaspers, MSc, Amsterdam University of Applied Sciences, NL
- Selma Piric, MSc, Human Performance Training & Consultancy, NL
- Martin Rejek, Dipl.-Ing, Zurich University of Applied Sciences, CH
- Alfred Roelen, PhD, Netherlands Aerospace Centre, NL
- John Stoop, PhD, Amsterdam University of Applied Sciences, NL
- Simon Whiteley, MSc, Dependable-Management Collaboration, UK

The conference would not have been possible without the commitment of all these individuals.

In the paper titled “Measuring Safety Through the Distance Between System States with the RiskSOAP Indicator” the authors present a method to compare “ideal” systems with the ones designed and operated in real life. The RiskSOAP approach is a comparison-based methodology that depicts the distance between two states of a system, and embodies three methods: STPA (System Theoretic Process Analysis), EWaSAP (Early Warning Sign Analysis) and dissimilarity measures. The practicality, applicability and generality of RiskSOAP is demonstrated through its application to three case studies. The purpose of this work is to suggest the RiskSOAP indicator as a measure for safety in terms of the gap between system versions.

The authors of the paper “Exploring the Diversity in Safety Measurement Practices: Empirical Results from Aviation” present the findings from a survey in 13 companies with the scope to explore how safety performance is measured in the aviation industry. The results from the surveys showed that there is a wide variety of approaches for assessing safety levels, and the companies encounter and/or recognize problematic areas in practice when implementing their safety management. The findings of the surveys suggested that the current ways of measuring safety performance are not as straight forward as it might be assumed. The researchers, in the frame of a 4-years’ project about aviation safety metrics funded by the Nationaal Regieorgaan Praktijkgericht Onderzoek SIA (NL), have started to explore alternative methods for measuring aviation safety performance without the requirement of huge amount of safety-related data.

The next paper is entitled “Lean Six-Sigma in Aviation Safety: An implementation guide for measuring aviation system’s safety performance”. The authors introduce a conceptual

framework that aims to improve the process of safety performance measurement and, ultimately, the aviation system's safety performance. The presented framework provides an implementation guide on how organizations could design and develop a measurement tool for proactively assessing and measuring the Acceptable Level of Safety Performance. The methodology adapts and combines quality management tools, a leading indicators program and Lean-Six Sigma methodology to formally measure and continuously improve a stable and in-control safety management process by reducing safety defects and variability from core organizational processes and objectives.

Industry best-practice contributions are discussed in the papers "POD and GUM - Universal Methods for Making Safety Measurable" and "Implementation of a Performance Evaluation System for Nondestructive Testing Methods". The first paper introduces a procedure using the example of tendon duct detection (POD) and depth position description (GUM) in concrete with Ground Penetrating Radar (GPR). The universal application of both methods (POD and GUM) in different fields of industries is illustrated by some examples. The second paper discusses the qualification of non-destructive testing methods and introduces an analysis tool that was developed to provide an accurate, detailed and reliable evaluation of inspection systems and personnel.

The author of the paper "Naive Fault Trees for Safety Evaluations in Early Project Phase" suggests the use of Naive Fault Trees (NFT) to extend the application of Fault Trees (FT) and make the latter appealing for system designers in the early project life cycle. Through a real-world example, the author demonstrates how NFT use input intervals and values to estimate the frequency of a top event and facilitate the assignment of failure probability to basic events when exact data is difficult to find, unavailable or even not existent.

Moving to the regulatory level, the following paper is entitled "How Completely and Similarly Do Safety Authorities Address Hazards Posed by New Technology? A Paradigm from Small-drone Operations". The authors applied the Systems-Theoretic Process Analysis (STPA) technique to small-drone operations and generated a set of 56 safety requirements concerning the regulators. Based on the analysis results, they reviewed 56 drone regulations, conducted a gap analysis against the safety requirements derived by STPA, and performed statistics in order to examine the extent of the harmonization of the regulations studied. The results suggest that those regulations satisfy 5.3% to 66.7% of the safety requirements, they are moderately similar, and their harmonization is even lower when considering the range of values of various safety requirements addressed by the authorities.

In the paper entitled "The Risk Observatory: Developing an Aviation Safety Information Sharing Platform in Europe", a EU-funded Future Sky Safety Program project is presented that aims to enable inter-organization and inter-domain safety management. The four-year project will deliver a tool, the Risk Observatory, which acquires safety data and translates it into actionable safety information. In the first year, more than 20 European stakeholder organizations have been consulted to express their needs for a Risk Observatory. The

resulting requirements have been used to develop an early prototype: mock-ups of dashboards and a user interface.

Connected with the aforementioned contribution, the paper “Aviation Safety Concerns for the Future” is a joint effort of the Future Aviation Safety Team (FAST) which, since 2004, has been maintaining a catalogue of ‘Areas of Change’ (AoC) that could potentially influence aviation safety. The authors present an overview of the current AoC catalogue and a subsequent discussion of related aviation safety concerns. Interactions among these future changes may weaken critical functions that must be maintained to ensure safe operations. The authors suggest that the use of an “Areas of Change” concept permits a systematic analysis of ongoing and future phenomena that may interact with a technology or operational concept under study and generate unanticipated hazards.

Especially referring to the defense sector, the paper “The Influence of Indonesian National and Military Organisational Culture on Safety Management Systems” contributes to the understanding of the cultural factors that might affect the adoption and implementation of the Safety Management System. The author through qualitative research found that that the Indonesian military culture has been much influenced by characteristics of the national culture, such as harmony, politeness, hierarchical systems, authoritarian structures, the military class system and the ‘can-do’ culture.

The ICSC proceedings conclude with the discussion paper “Safety; a system state or property?”. The author advocates the validity and importance of incorporating intrinsic technological hazards and systemic interrelations from a multi-actor perspective in the early phases of design and development. This way inherent properties in various system states are created, which may later manifest themselves as emergent properties during operations. With the presentation of three real-world cases regarding major aviation and railway projects, the author highlights that safety properties are based on the business models adopted, the latter selectively focusing on primary system components such as infrastructure, vehicles or traffic management.

Judging from the variety, content and quality of the conference and spoken papers we are convinced that the 1st edition of the ICSC was successful and served its intended scope. We look forward to welcome you at the next edition of the ICSC.

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