

2019

24-27 June

The 8th REA Symposium Embracing resilience: Scaling up and speeding up



Resilience Engineering
Association



Conference overview

Registration is open every day of the conference between 8:00-9:00

Monday 24/6		Tuesday 25/6		Wednesday 26/6		Thursday 27/6	
YT program	Workshop	Workshop	Conference opening and Welcome 8:30 Coffee & Poster exhibition 9:30-9:45	Keynote: Abreu Suarin 8:30-9:00	Keynote: Alm 8:30-9:00		
	Workshop	Workshop	Session C 9:45-11:15 Coffee & Poster exhibition 9:30-9:45	Session G 9:00-10:30	Session I 9:00-10:30		
8:30-14:30	Herrera et al. 9:00-12:00	Lay et al. 9:00-14:30	Session A 9:45-11:15 Keynote: Axvi 11:15-11:45	Coffee & Poster exhibition 10:30-10:45	Coffee & Poster exhibition 10:30-10:45		
			Lunch 11:45-12:30	Round table discussion Rayo et al. 10:45-12:15	The challenge of water scarcity 10:45-11:15		
			Young talents presentation 12:30-13:00	Lunch 12:15-13:00	Lunch 11:15-12:00		
	Workshop	Workshop	Maritime simulator 13:00-14:30	Plenary session Critical digital services 13:00-13:30	HRO and RE innovation game Herrera 12:00-13:30		
			Coffee & exhibition 14:30-14:45	Session D 13:00-14:30	Coffee & Poster exhibition 13:30-13:45		
	Reynolds et al. 13:00-16:30	Ferreiro et al. 13:00-16:30	Keynote: Hollnagel 14:45-15:15	Session J 13:30-15:00	Closing ceremony 13:45-14:15		
	Keynote: Woods 16:30-17:45		Poster session 15:30-16:00	Session K 13:30-15:00			
			General Assembly 17:15	Session H 16:00-17:30			
	Social program at Kalmar Salen 18:30			Session B 16:00-17:30			
				Conference dinner at Kalmar castle 19:00			

Rooms	Ma1065	Ma121	Ma129	Ma119
	Ma221	Ma220	Ma135	Ma135

Welcome to Kalmar!

As President of the Resilience Engineering Association, I am delighted to welcome you all to the 8th Resilience Engineering Symposium. As we hold one roughly every 2 years, it means that the Resilience Engineering movement is 16 years old. Indeed, the founding workshop was held in Söderköping, here in Sweden, less than 200 Km to the North, in October 2014. So in a way, for some of us – the "bleached-under-the-harness"-, this is a return to the roots. Thanks for joining us! I bet you will not regret it. Not only because Kalmar is a great place to visit (particularly at this time of the year, (in order to maximize one' exposure to sunlight), but also simply because this will be a great conference. I can perceive the precursory signs: a great organization by the Linnaeus University team, a great program, more than 140 participants registered, and an exhilarating question in front of us – how to help our Industry and our Societies to outmaneuver the challenge of the ubiquitous growth of complexity?

Jean Pariès

President

Resilience Engineering Association



REA - Resilience Engineering Association

The Resilience Engineering community currently brings together some 200 academia and industry representatives that more or less regularly exchange at different levels. Throughout the years, there has been many fluctuations in the number, frequency and scope of these exchanges. Themes and issues have shifted from a more conceptual nature to a clearly applied one, and a wider diversity of industry sectors is represented in the various discussions that are undertaken around our community.

While some remain with us since the foundation of the association and even since the birth of the Resilience Engineering concept, and more or less directly contribute to our activities, many others have drifted off or pursued different paths. In addition, only a fraction of these close to 200 community members have committed to a regular REA membership. This clearly shows that, despite the growth in the community and its activity, our work remains short of expectations.

The changes that our community has known over the years has inevitably reflected on the various symposium editions. The diversity of topics, contributions and of the discussions that emerge around them has always been an outstanding trend of REA symposia. This year's edition is no exception and promises yet another substantial contribution to the development of resilience engineering practice. While this is unarguably very positive, it poses a challenge for REA as an organisation. Maintaining the cohesiveness of the community and of the work that is produced within, has often proven difficult, particularly when faced with few resources and an evident overuse of the term resilience across all industry domains.

The symposium is a central activity of REA, but the dynamics and demands that are currently experienced in both academia and industry; require a wider diversity of opportunities for engagement and exchange. Fostering broad sector and cross-sector discussions is as important as promoting the validation of tools and solutions for context specific issues. REA symposia cannot realistically address such diversity of demands, which means that more than ever, REA as an organisation, must generate a higher diversity of opportunities for reflection and exchange. This is the key motivation for the review of fundamental resources such as REA's website, and the development of other communication initiatives that are still planned for this year, particularly the production of a newsletter as a way to ensure continuity of discussions at certain levels, and the planning of other events such as webinars. It is our firm belief that this will enrich the Resilience Engineering community as whole, REA as an organisation, and naturally, also contribute to the sustained success of future symposia editions.

Pedro Ferreira
REA Secretary

Keynote speakers

Monday

16:30-17:15 Ma135

David Woods



Professor in Integrated Systems Engineering at the Ohio State University, USA.

Progress, Pragmatics, Foundations: What the Resilience Engineering Community contributes, What the Resilience Engineering Community can do, What the Resilience Engineering Community has discovered

17:15-17:45
Richard Cook

Physician, researcher, and educator at the Department of Integrated Systems Engineering at the Ohio State University in Columbus, USA, and emeritus professor of healthcare systems safety at KTH, Sweden.

Bone is Resilience and Demonstrates Two Ways to Engineer Resilience

Tuesday

11:15-11:45 Ma135

Lars Axvi



Captain, lecturer at Chalmers University of Technology, Sweden

Holding on to tight - Is procedural compliance overriding "good seamanship"

14:45-15:15
Erik Hollnagel



Senior professor of Patient Safety at Jönköping University, Sweden

Advancing resilient performance: From instrumental applications to second-order solutions

Wednesday

08:30-09:00 Ma135

Tarcisio Abreu Saurin



Associate Professor at the Industrial Engineering Department of the Federal University of Rio Grande do Sul (UFRGS), Brazil

Resilient healthcare: a theoretical and practical perspective of the state-of-the-art

15:30-16:00 Ma135

Milena Studic



Corporate Safety Management Expert at skeyes, Belgium

Disaster avoided: Was it due to system resilience, robustness or pure chance?

Thursday

08:30-09:00 Ma135

Helen Alm



Safety and Environment manager at Fuel, Engineering and Projects within Vattenfall, Sweden.

Resilience in a world of barriers, an industry update on Resilience within the Swedish nuclear industry.

MONDAY 24 JUNE 2019

Young talents program All day event 08:30-14:30 Place: Ma119

Workshops

Time: 09:00-12:00	Place: Ma221
I. Herrera	Discovering and exploring practical interventions related to resilience management
Time: 09:00-12:00	Place: Ma121
J. Pariès	A tool to assess organizational resilience
Time: 09:00-14:30	Place: Ma129
E. Asher Balkin E. Lay C. Jefferies	Sacrifice Decision Workshop Using a Simulating a real NASA event
Time: 09:00-16:30	Place: Ma220
A. Ní Bhreasail S. Gill	Exploring challenges in the implementation of resilience
Time: 13:00-16:30	Place: Ma121
Reynolds /Rayo/ Woods	Proactive Systemic Contributors and Adaptations Diagramming (SCAD-P): A Lightweight Tool Delivering Heavyweight Systems-level Insights
Time: 13:00-16:30	Place: Ma221
P. Ferreira R. Patriarca	Workshop on FRAM – tools and applications

Social program

Monday 24/6 Social event at Glasverandan, KalmarSalen 18:30

Mingle with the symposium delegates and have some light food and refreshments.

We will also listen to a lecture about some important historical developments of Kalmar city by antiquarian Linda Liljeberg, touching upon the resilience of cities.

TUESDAY 25 JUNE 2019

Conference opening

Time: 08:30-09:30

Place: Ma135

Scientific chair of the REA symposium, Sidney Dekker, president of the REA Jean Pariès and Staffan Carius from Linnaeus University, welcomes you to Kalmar and the 8th REA Symposium Embracing resilience: scaling up and speeding up.

Session C: Maritime

Time: 09:45-11:15

Place: Ma1065

Chair: Cecilia Österman

M. Baldauf (Germany) 03. Resilient Operation of manned and unmanned Ships from Ashore

M. Wahlström (Finland) 52. Resilience on the Seven Seas: Perspective-taking in Anticipatory Ship Navigation

J-O. Lindh (Sweden) 31. A latency-based metric for layered control models

F. Veenstras (Netherlands) 48. Contemporary Fisheries Risks and SME Resilience. Dutch fishing vessel (re)designing 1988-2018

A. Koimtzoglou (Greece) 57. Implementing Resilience to the maritime domain

Session A: Preparedness and training

Time: 09:45-11:15

Place: Ma135

Chair: Anthony Smoker

M. Lammers (Netherlands) 30. Training resilient decision-making with a serious game: how effective
M. Chambon (Netherlands) is this resilience intervention?

R. Melo (Brazil) 35. Reducing the gap between work as imagined on construction safety supported by UAS

G. Praetorius (Sweden) 42. Including resilience in non-technical skill training – a research agenda for the shipping and healthcare domain

M. Takahashi (Japan) 50. Experimental study on the effect of procedure under unexpected situations

S. Wikman (Sweden) 53. How to prevent workplace violence in Swedish state agencies - a criminological study inspired by resilience engineering

Session D: Critical infrastructure I

Time: 13:00-14:30

Place: Ma135

Chair: Staffan Bram

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| D. Eisenberg (USA) | 07. What's wrong with the critical functionality curve for resilience? |
| M. Gonzva (France) | 11. Adaption of infrastructures, cities, territories and their uses to climate change: the "resallience" approach |
| I. Herrera (Norway) | 18. Resilience management guidelines for critical infrastructures, translating resilience theory into practical and useful interventions |
| J. R. Huse (UK) | 22. Resilience Shift program. Objectives, execution and preliminary results |
| M. Kitamura (Japan) | 61. Resilience Assessment Grid (RAG) for Facilitating Safety Consciousness of Nuclear Power Plant Personnel |

Maritime simulator

Time: 13:00-14:30

Bridge Simulator (3rd floor), Engine Room Simulator (2nd floor), Safety Training Facilities (Rescue Training Center, near KalmarSalen)

Poster session

Time: 15:30-16:00

Place: Ma1065

Listen to a short poster pitch of the presenters before visiting the poster exhibition outside Ma135.

Session E: From hazards to resilience

Time: 15:30-17:00

Place: Ma135

Chair: Elizabeth Lay

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| Y. Merino Peña (Chile) | 36. Building bridges, minding the gaps:involving the perspectives of older people in creating resilient healthcare infrastructure to disasters |
| Y. Eri Saputra (Taiwan) | 09. Identification of invisible hazardous situations from the recorded conversation before Puyuma train accident |
| S. Gill (UK) | 10. Use of human hazard analysis to enhance resilient performance of helicopter maintenance systems |
| E. Henriqson (Brazil) | 16. Selection of instantiations through risk analysis in FRAM models: a method proposal |
| N. McDonald (Ireland)
P. Ulvfengren (Sweden) | 33. Governance, complexity and deep system threats |

REA General Assembly

Time: 17:15 Place: Ma135

For REA-members only

WEDNESDAY 26 JUNE 2019

Session G: Methods and measures

Time: 09:00-10:30

Place: Ma1065

Chair: Ivonne Herrera

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| E. Henriqson (Brazil) | 15. Exploring methodological procedures of TORC: a multi-method approach |
| C. Koepke (Germany) | 28. A joint approach to safety, security and resilience using the Functional Resonance Analysis Method |
| S. Carriere (Canada) | 5. From Cheese to STEW: Incorporating a systems' approach to critical incident analysis |
| M. Rayo (USA) | 44. Making room for slack: strategies for preserving current adaptive capacity and sneaking in some more |
| R. IJntema (Netherlands) | 24. Psychological resilience-building programmes at work: A systematic review and classification |

Session F: Health care

Time: 09:00-10:30

Place: Ma135

Chair: Mirjam Ekstedt

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| K. Aase (Norway) | 01. Patient and family perspectives in resilient healthcare studies: When, where and how to integrate them? |
| J. Hamming (Netherlands) | 13. Widening the perspective of surgical morbidity and mortality conferences: Enhancing resilience by toward learning from everyday performance and outcome |
| P. Hidefjäll (Sweden) | 19. Resilience in the Swedish healthcare system |
| K. Hybinette (Sweden) | 23. Coordinative strategies for sustaining resilience and safe care practices – an exploratory observational study of first line management in a neonatal intensive care setting |
| J. Svensson (Sweden) | 49. Patterns of performance variability: a meso-level understanding of psychiatric discharge |
| V. Bertoni Becker (Brazil) | 63. The use of social network analysis for evaluating the resilience potentials: a study of an intensive care unit |

Round table discussion

Time: 10:45-12:15

Place: Ma135

M. Rayo (USA) Systemic Contributors Roundtable - (RE)-Introducing Methods and Models To Fight the Tyranny of Root Cause Analyses

Panel discussion with Mike Rayo, Elizabeth Lay, Pedro Ferreira, David Provan, and John Allspaw.

Plenary session

Critical Digital Services

Time: 13:00-13:30

Place: Ma135

Introduction: David Woods & Richard Cook, CSEL OSU and SNAFU Catchers Consortium

Industry Panel: John Allspaw, Beth Long, David Leigh, Nora Jones, Paul Reed

What is Critical Digital Services?

1. *A sector that uses/requires Resilience Engineering (RE).*
2. *A vital infrastructure for all other sectors and must demonstrate resiliency.*
3. *A natural laboratory where complexity, autonomy and adaptation operate at scale and velocity to understand fundamentals for RE.*

Web Engineering & Operations provides critical digital services for e-enterprise, financial organizations and many others. All organizations are, or are becoming, critically dependent on digital software services. This session will show how web engineering/ops is a domain that has found resilience engineering essential as it struggles to adapt to growth, speed, and scale pressures that arise from new capabilities. The pragmatic steps illustrate the practical relevance of RE at this stage of development. How and why web engineering/ops found resilience engineering important also makes this domain a natural laboratory where we can see fundamental patterns about adaptive systems in complex worlds that generalize across sectors and anticipate challenges other sectors may experience.

Session K: Risk & resilience in critical digital infrastructure

Time: 13:30 – 15:00

Place: Ma135

Chair: Pedro Ferreira

The short talks in this session will cover practitioner experiences with resilience engineering within the digital services domain.

J. Robke & D. Leigh (IBM)

Managing Incident Response across distributed networks

B. Long (New Relic)

Exploring forms of resilient response teams for digital systems

J.P. Reed (Release Engineering Approaches)

Learning from incidents in software development & operations

R. Gonzalez (IEX)

Maintaining resilience and reliability in highly regulated, high speed critical digital systems.

Nora Jones (Slack)

Chaos Engineering: A step towards resilience.

M. Grayson (Mile 2)

Approaching Overload: Diagnosis and Response to Anomalies in Complex and Automated Systems

L. Maguire (The Ohio State University)

Exploring the costs of coordination in large scale, distributed work systems.

Session J: Putting resilience in perspective

Time: 13:30-15:00

Place: Ma1065

Chair: Amanda Hellström

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| D. Provan (Australia) | 43. Caught in the middle: How safety professionals can move forward through the practical application of Resilience Engineering to their role |
| R. Patriarca (Italy) | 40. Who? What? Where? When? A scientometric perspective on resilience engineering |
| E. Rigaud (France) | 46. Considering culture when studying resilience: proposition of a FRAM based model of the variability of culture |
| T. Haavik (Norway) | 12. Societal resilience – resilience upscaled beyond critical infrastructures |

Session H: Aviation

Time: 16:00-17:30

Place: Ma1065

Chair: Anna-Lisa Osvalder

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| A. Smoker (Sweden) | 58. The Resilient Performance of Multiple Remote Tower Centre: sustaining virtual operations |
| M. Branlat (Norway) | 4. Connectivity and resilience of remote operations: insights from air traffic management |
| D. Karikawa (Japan) | 25. Resilience of Air Traffic Controllers in Control Tower |
| R. Patriarca (Italy) | 39. Receipt and dispatch of an aircraft: a functional risk analysis |

Session B: Practitioners' session

Time: 16:00-17:30

Place: Ma135

Chair: Pedro Ferreira

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| E. Lay (USA) | 55. Learning from surprise |
| M. Haage (Sweden) | TBA |
| E. Henriqson (Brazil) | 17. Implications of prescriptions over stability and flexibility in high hazard organizations |
| G. Peñaloza (Brazil) | 41. Safety-I and Safety-II: exploring opportunities for an integrated approach in the construction industry |
| S. Huber (Schweiz) | 20. The next step towards operationalizing resilience: the measurement of self-synchronisation |

Social program

Wednesday 26/6 Conference dinner at Kalmar Castle 19:00

There will be a two-course dinner and a guided tour around the old castle that was built in the late 12th century.

THURSDAY 27 JUNE 2019

Session I: Critical infrastructure II

Time: 09:00-10:30

Place: Ma135

Chair: Helene Degerman

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| D. Alderson (USA) | 08. Rethinking big data analytics for critical infrastructure resilience |
| B. McAndrew (UK) | 32. Resilience of UK Water and Wastewater Systems - why we need to get wise before we get smart |
| J. Karlton (Sweden) | 26. Positioning the study of first line managers' resilient action strategies |
| R. Nazari (USA) | 37. Understanding Damage and Resilience Assessment of Urban Coastal Structures |

Plenary session

Time: 10:45-11:15

Place: Ma135

A. Lindholm

The road from water shortage to success

Time: 12:00-13:30

Place: Ma135

I. Herrera

Resilience and HRO in action – Innovation game: Prune the future

Closing ceremony

Time: 13:45-14:15

Place: Ma135

Jean Pariès

Posters

Poster exhibition:

Tuesday & Wednesday

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| P. Apell (Sweden) | 02. Diffusion of Resilience as a concept and technology |
| P. H. Meland (Norway) | 34. Resilient Cyber Security through Cybercrime Market Analysis |
| F. T. Kalakou (Norway) | 51. Psychological factors contributing to compliance and non-compliance among healthcare professionals |
| M. Pardo Ferreira (Spain) | 38. Analyzing the progress in the application of Resilience Assessment Grid |
| S. Øyri (Norway) | 59. Regulatory rationale and governmental expectations for a new internal control regime in healthcare |

T. Kanno (Japan)	60. Resource-based business continuity and resiliency planning
H. Fujino (Japan)	61. Community systems approach for staff members' safety-related knowledge management
N. Ransolin (Brazil)	62. Combining structural and functional modelling: exploring the relationship between the built environment and resilient healthcare
B. Cassottana (Singapore)	63. Towards resilient water networks: a quantitative method to evaluate recovery strategies
D. Coelho (Brazil)	64. A framework for ethnographic human factors studies in product realization systems
L. Maguire (USA)	65. Buried deep: the cognitive work of snow safety professionals
N. Kulev (Germany)	66. Non-resilient behavior of offshore wind farms due to cyber-physical attacks
R Woltjer (Sweden)	67. Organisational capability of agile response to crises
M. Wahlström	68. Resilience through reflection and auto-confrontation training

Scientific program committee

Program Chairs: Sidney Dekker, Griffith University, Australia & Mirjam Ekstedt, LNU, Sweden

Gudela Grote, ETH Zürich, Switzerland

Robert Jan de Boer, Amsterdam University of Applied Science, Netherlands

Kiku Pukk Härenstam, Karolinska Institute, Sweden

Janet Anderson, Kings College, UK

Jean Pariès, Dédale, France

Jan Maarten Schraagen, TNO, Netherlands

Karina Aase, University of Stavanger, Norway

Jaco Westhuizen, Air Traffic and Navigation Services SOC Limited, South Africa

Anne-Sophie Nyssen, University of Liege, Belgium

Richard Cook, Ohio State University, USA

Matthieu Branlat, SINTEF, Norway

David Alderson, Naval Postgraduate School, USA

Gesa Praetorius, LNU, Sweden

Organizing committee

Organizing Chairs: Gesa Praetorius & Amanda Hellström

Helene Degerman, Ri.SE, Sweden

Staffan Bram, Ri.SE, Sweden

Anthony Smoker, Lund University, Sweden

Ivonne Herrera, SINTEF, Norway

Pedro Ferreira, Instituto Superior Técnico, Portugal

Sudeep Hedge, PhD (Young Talents Program Chair), University at Buffalo, New York, USA

Elizabeth Lay, Applied Resilience, USA

AnnaLisa Osvalder, Chalmers University of Technology

Carl Hult, LNU, Sweden

Cecilia Österman, LNU, Sweden

The organizing committee would like to thank:

Staff2020: An additional resource in Kalmar municipality that performs work such as short-term projects or activities that are organized by and in the municipality of Kalmar. The Staff2020 group has assisted us with registration and hosting.

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