

# **7th IET International Conference on System Safety and the Cyber Security Conference 2012**

**IET Conference Publications 607**

**Edinburgh, United Kingdom  
15-18 October 2012**

**ISBN: 978-1-62748-123-6**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2012) by the Institution of Engineering and Technology  
All rights reserved.

Printed by Curran Associates, Inc. (2013)

For permission requests, please contact the Institution of Engineering and Technology  
at the address below.

Institution of Engineering and Technology  
P. O. Box 96  
Stevenage, Hertfordshire  
U.K. SG1 2SD

Phone: 01-441-438-767-328-328  
Fax: 01-441-438-767-328-375

[www.theiet.org](http://www.theiet.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## TABLE OF CONTENTS

<b>Ensuring Supplier Safety Analysis is Not Performed in Isolation! The Gulf Between the Project Safety Engineer and the Front Line User.....</b>	<b>1</b>
<i>N. B. Durston</i>	
<b>Unplugged Perils, Lost Hazards and Failed Mitigations.....</b>	<b>6</b>
<i>N. Barton, A. J. Rae</i>	
<b>ISO 26262 Concept Phase Safety Argument for a Complex Item.....</b>	<b>12</b>
<i>I. Ibarra, S. Hartley, S. Crozier, D. Ward</i>	
<b>Evidence-based Development - Coupling Structured Argumentation with Requirements Development.....</b>	<b>17</b>
<i>A. J. J. Dick</i>	
<b>Towards Understanding the DO-178C / ED-12C Assurance Case .....</b>	<b>22</b>
<i>C. M. Holloway</i>	
<b>A Practical Proposal for Ensuring the Provenance of Hardware Devices and Their Safe Operation.....</b>	<b>28</b>
<i>Y. Kovalchuk, W. G. J. Howells, H. Hu, D. Gu, K. D. McDonald-Maier</i>	
<b>What Does the Assurance Case Approach Deliver for Critical Information Infrastructure Protection in Cybersecurity?.....</b>	<b>34</b>
<i>A. C. Goodger, N. H. M. Caldwell, J. T. Knowles</i>	
<b>Preparing for Cyber-attacks on Air Traffic Management Infrastructures: Cyber-safety Scenario Generation.....</b>	<b>40</b>
<i>C. W. Johnson</i>	
<b>Cost Effective Assessment of the Infrastructure Security Posture .....</b>	<b>46</b>
<i>G. P. Williams</i>	
<b>Analysis and Optimization of Mixed-Criticality Applications on Partitioned Distributed Architectures.....</b>	<b>52</b>
<i>D. Tamas-Selicean, S. O. Marinescu, P. Pop</i>	
<b>Capitalize on Complexity .....</b>	<b>58</b>
<i>N. McGuire, M. Kreidl, Sheng Cheng</i>	
<b>Applying Failure Mode Modular De-composition (FMMD) Across the Software/Hardware Interface .....</b>	<b>67</b>
<i>R. Clark, A. Fish, C. Garrett, J. Howse</i>	
<b>Generic Security Cases for Information System Security in Healthcare Systems.....</b>	<b>73</b>
<i>Y. He, C. W. Johnson</i>	
<b>On the Relationship of Hazards and Threats in Railway Signaling .....</b>	<b>79</b>
<i>J. Braband, M. Seemann</i>	
<b>Assessing and Improving Software Quality in Safety Critical Systems by the Application of a Software Test Maturity Model .....</b>	<b>85</b>
<i>F. I. Duncan, A. G. Smeaton</i>	
<b>Failure Mode and Effects Analysis (FMEA) and Model-checking of Software for Embedded Systems by Sequential Scheduling of Vectors of Logic-labelled Finite-state Machines.....</b>	<b>89</b>
<i>V. Estivill-Castro, R. Hexel, D. A. Rosenblueth</i>	
<b>Combined Safety and Security Certification.....</b>	<b>95</b>
<i>G. Romanski</i>	
<b>'You Don't Know Jack': Using 3D Anthropometric Modelling Techniques to Identify, Assess and Aid in the Early Resolution of Safety Issues Relating to Military Vehicle Design.....</b>	<b>100</b>
<i>G. R. Hudson, D. Barker, J. H. Barton, D. G. B. Varney</i>	
<b>Security in Integrated Vtronics: Applying Elliptic Curve Digital Signature Algorithm to a Safety-Critical Network Protocol-TTP/C .....</b>	<b>105</b>
<i>A. Deshpande, O. Obi, E. Stipidis, P. Charchalakis</i>	
<b>The Application of Data Diodes for Securely Connecting Nuclear Power Plant Safety Systems to the Corporate IT Network .....</b>	<b>110</b>
<i>R. T. Barker, C. J. Cheese</i>	
<b>A Holistic Approach to Trustworthy Software .....</b>	<b>116</b>
<i>I. Bryant</i>	
<b>Comparing the Identification of Recommendations by Different Accident Investigators Using a Common Methodology .....</b>	<b>122</b>
<i>C. W. Johnson, H. A. Oltedal, C. M. Holloway</i>	
<b>Analysis and Modelling of Space Shuttle Challenger Accident Using Management Oversight and Risk Tree (MORT) .....</b>	<b>129</b>
<i>S. K. Appicharla</i>	

<b>Towards Parsimonious Resource Allocation in Context-aware N-version Programming.....</b>	137
<i>J. Buys, V. De Florio, C. Blondia</i>	
<b>Securing the Human to Protect the System: Human Factors in Cyber Security.....</b>	143
<i>M. G. Lee</i>	
<b>Safety Enhancement Through Situation-aware User Interfaces .....</b>	148
<i>V. De Florio, C. Blondia</i>	
<b>System Security Assessment Using a Cyber Range.....</b>	154
<i>H. Winter</i>	
<b>Emerging Good Practice for Cyber Security of Industrial Control Systems and SCADA.....</b>	159
<i>R. S. H. Pigglin</i>	
<b>The Uses and Abuses of ASIL Decomposition in ISO 26262.....</b>	165
<i>D. D. Ward, S. E. Crozier</i>	
<b>Agonising Over ASILs: Controllability and the In-wheel Motor .....</b>	171
<i>M. Ellims, H. E. Monkhouse</i>	
<b>The Four Principles of Product Safety.....</b>	179
<i>N. Sibley, B. Walby, D. Priestley</i>	
<b>Trust and Control: A Safety Model for People and Organisations .....</b>	183
<i>W. A. Hoskins</i>	
<b>The Save Me Project Real-time Disaster Mitigation and Evacuation Management System.....</b>	188
<i>I. Tsekourakis, C. Orlis, D. Ioannidis, D. Tzovaras</i>	
<b>(SMA)<sup>2</sup> - A Social Media Audience Sharing Model for Authorities to Support Effective Crisis Communication.....</b>	194
<i>S. Raue, C. W. Johnson, T. Storer</i>	
<b>A Framework for Determining the Sufficiency of Software Safety Assurance .....</b>	200
<i>R. D. Hawkins, T. P. Kelly</i>	
<b>Emerging Technologies with the Potential to Impact Safety in Defence .....</b>	206
<i>P. R. Caseley, G. T. Strong, D. J. H. Smith, K. J. Bown, B. K. Madahar</i>	
<b>Author Index</b>	