In this file, we have organized the publications by analysis type, industry, topic, etc. Papers are duplicated that fall under several categories. The categories and organization is:

GENERAL

Engineering a Safer World: Applying Systems Thinking to Safety by Nancy Leveson. Published by MIT Press (January 2012).

Safeware: System Safety and Computers by Nancy Leveson. Published by Addison Wesley (1995)
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A New Accident Model for Engineering Safer Systems by Nancy Leveson. *Safety Science*, Vol. 42, No. 4, April 2004

Extending and Automating a Systems-Theoretic Hazard Analysis for Requirements Generation and Analysis by John Thomas, MIT Ph.D. Dissertation, June 2013

Drawbacks in using the term "System of Systems." by Nancy G. Leveson

The Systems Approach to Medicine: Controversy and Misconceptions by Sidney W.A. Dekker and Nancy G. Leveson. *BMJ Quality and Safety*, Vol. 24, No. 1, August 2014 (online version)

[*Letter to Editor*: **Challenging the Systems Approach: Why Adverse Event Rates Are Not Improving** by Philip Levitt, M.D.

Our Response: **The bad apple theory won't work: Response to 'Challenging the systems approach: why adverse event rates are not improving' by Dr. Levitt** by Sidney Dekker and Nancy Leveson

Rasmussen's Legacy: A Paradigm Change in Engineering for Safety. by Nancy Leveson, *Applied Ergnomics,* , Special Issue on Reflecting on the Legacy of Jens Rasmussen, in press 2016

TYPE OF ANALYSIS

Hazard Analysis (STPA)

STPA Handbook (English version)

STPA Handbook (Japanese version, coming soon)

Extending and Automating a Systems-Theoretic Hazard Analysis for Requirements Generation and Analysis by John Thomas, MIT Ph.D. Dissertation, June 2013

Application of Systems and Control Theory-Based Hazard Analysis to Radiation Oncology, by Todd Pawlicki, Aubrey Samost, Derek Brown, Ryan Manger, Gwe-Ya Kim, and Nancy Leveson. *Journal of Medical Physics* , in press, 2016

Systems Theoretic Process Analysis Applied to an Offshore Supply Vessel Dynamic Positioning System. by Blake Ryan Abrecht, MIT M.S. in Engineering Systems Thesis, June 2016.

Systems Theoretic Process Analysis Applied to Air Force Acquisition Technical Requirements Development by Sarah E. Summers (Major, USAF)

Systems-Theoretic Safety Analyses Extended for Coordination by Kip Edward Johnson, MIT Dissertation, Aeronautics and Astronautics Dept., February 2017.

Systems Thinking Applied to Automation and Workplace Safety. by Nathaniel Arthur Peper, MIT Masters Thesis, June 2017.

Systems-Theoretic Process Analysis of Small Unmanned Aerial System Use at Edwards Air Force Base. by Sarah A. Folse, MIT Aeronautics and Astronautices Masters Thesis,June 2017.

A New Approach to Hazard Analysis for Rotorcraft by Blake Abrecht, Dave Arterburn, David Horney, Brandon Abel, Jon Schneider, and Nancy Leveson. Proceedings of the 2016 American Helicopter Society Technical Meeting, Huntsville, AL, February 2016

Systems-Theoretic Accident Model and Processes (STAMP) Applied to a U.S. Coast Guard Buoy Tender Integrated Control System. by Paul D. Stukus, MIT SDM Masters Thesis, June 2017

Hazard Analysis of Complex Spacecraft using Systems Theoretic Process Analysis by Takuto Ishimatsu, Nancy G. Leveson, John Thomas, Cody Fleming, Masafumi Katahira, Yuko Miyamoto, Ryo Ujiie, Haruka Nakao, and Nobuyuki Hoshino, *AIAA Journal of Spacecraft and Rockets* , in press, 2013

A Systems Approach to Patient Safety: Preventing and Predicting Medical Accidents Using Systems Theory, , by Aubrey Samost, MIT Master's Thesis, June 2015

System-Theoretic Process Analysis of the Air Force Test Center Safety Management System. , by Nicholas Chung, MIT Master's Thesis, February 2014

Using STPA to Inform Developmental Product Testing by Major Daniel R. Montes, U.S. Air Force, MIT Ph.D. Dissertation, February 2016

Accident Analysis and Hazard Analysis for Human and Organizational Factors by Margaret Stringfellow, October 2010

A System-Theoretic Hazard Analysis Methodology for a Non-advocate Safety Assessment of the Ballistic Missile Defense System by Steve Pereira, Grady Lee, and Jeffrey Howard. Proceedings of the 2006 AIAA Missile Sciences Conference, Monterey, CA, November 2006

Integration of Multiple Active Safety Systems Using STPA by Seth Placke, John Thomas, and Dajiang Suo, SAE Technical Paper 2015-01-0277, April 2015, doi:10.4271/2015-01-0277

A Comparison of STPA and the ARP 4761 Safety Assessment Process by Nancy Leveson, Chris Wilkinson, Cody Fleming, John Thomas, and Ian Tracy. MIT Technical Report, June 2014

Systems Theoretic Process Analysis (STPA) of an Offshore Supply Vessel Dynamic Positioning System, by Blake Abrecht and Nancy Leveson MIT Lincoln Laboratory Research Report, Feb. 17, 2016

Evaluating the Safety of Digital Instrumentation and Control Systems in Nuclear Power Plants by John Thomas, Francisco Luiz de Lemos, and Nancy Leveson, Research Report: NRC-HQ-11-6-04-0060, November 2012

STPA Analysis of NextGen Interval Management Components: Ground Interval Management (GIM) and Flight Deck Interval Management (FIM) by Cody H. Fleming, M. Seth Placke, and Nancy Leveson, FAA and Lincoln Lab, September 2013.

Safety-Guided Design Analysis in Multi-Purposed Japanese Unmanned Transfer Vehicle. by Ryo Ujiie, System Design and Management Master's Thesis, September 2016.

STAMP applied to Fukushima Daiichi nuclear disaster and the safety of nuclear power plants in Japan. by Daisuke Uesako, MIT Master's Thesis, System Design and Management Program, June 2016.

Safety benefit assessment, vehicle trial safety and crash analysis of automated driving: a Systems Theoretic approach. by Stephanie Alvarez, Ecole Mines Paris Tech, Ph.D. Dissertation, June 2017

System Theoretic Process Analysis of Electric Power Steering for Automotive Applications , by Rodrigo Sotomayor Martinez, MIT Master's Thesis, June 2015

Managing Design Changes using Safety-Guided Design for a Safety Critical Automotive System , by John Sgueglia, MIT Master's Thesis, June 2015.

Systems Theoretic Hazard Analysis (STPA) Applied to the Risk Review of Complex Systems: An Example from the Medical Device Industry by Blandine Antoine, MIT Ph.D. dissertation, December, 2012

Generating Formal Model-Based Safety Requirements for Complex, Software- and Human-Intensive Systems, by John Thomas and Nancy Leveson, Safety-Critical Systems Club, Bristol, U.K., 2013.

An Integrated Approach to Requirements Development and Hazard Analysis. by John Thomas, John Sgueglia, Dajiang Suo, and Nancy Leveson. SAE Technical Paper 2015-01-0274, April 2015, doi:10.4271/2015-01-0277.

Application of CAST and STPA to Railroad Safety. , by Airong Dong, MIT Master's Thesis, May 2012

Safety-Guided Spacecraft Design using Model-Based-Specifications by Cody Fleming, Takuto Ishimatsu, Yuko Miyamoto, Haruka Nakao, Masa Katahira, Nobuyuki Hoshino, John Thomas, and Nancy Leveson, International Association for the Advancement of Space Safety Conference, Versailles, France, Oct 2011

A New Approach to Risk Management and Safety Assurance in Digital Instrumentation and Control Systems by John Thomas and Nancy Leveson, American Nuclear Society Conference, Nov. 2013

System-Theoretic Process Analysis of Space Launch Vehicles by John Rising and Nancy Leveson, Journal of Space Safety Engineering, Elsevier, 2018 in press.

Systems Theoretic Process Analysis Applied to Manned-Unmanned Teaming, Jeremiah Robertson, MIT Masters Thesis, January 2019

Active STPA: Integration of Hazard Analysis into a Safety Management System Framework, Diogo Silva Castilho, Ph.D. Dissertation, Aeronautics and Astronautics, Sept. 2019.

Accident Analysis (CAST)

CAST Analysis of the Shell Moerdijk Accident by Nancy G. Leveson

Increasing Learning from Accidents: A Systems Approach Illustrated by the UPS Flight 1354 CFIT Accident by Shem Malmquist, Nancy Leveson, Gus Larard, Jim Perry, and Darren Straker, May 2019

The Underestimated Value of Safety in Achieving Organization Goals: CAST Analysis of the Macondo Accident. by Maria Fernanda Tafur Munoz, MIT Engineering and Management Master's Thesis, June 2017.

Systems-Theoretic Accident Model and Processes (STAMP) Applied to a U.S. Coast Guard Buoy Tender Integrated Control System. by Paul D. Stukus, MIT SDM Masters Thesis, June 2017

Learning from Accidents that are a consequence of complex systems. by John Thomas and Shem Malmquist, ISASI Conference

Applying Systems Thinking to Analyze and Learn from Events by Nancy Leveson, *Safety Science*,Vol. 49, No. 1, January 2010, pp. 55-64

A Systems Approach to Analyzing and Preventing Hospital Adverse Events by Nancy Leveson, Aubrey Samost, Sidney Dekker, Stan Finkelstein, and Jai Raman. *Journal of Patient Safety* , in press, 2016

A STAMP Analysis of the LEX Comair 5191 Accident , by Paul S. Nelson, Master's Thesis, Lund University, Sweden, June 2008, supervised by Prof. Sidney Dekker.

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Comparison of SOAM and STAMP for ATM Incident Investigation by Richard Arnold, Master's Thesis, Lund University, Sweden, 2009, supervised by Prof. Sidney Dekker.

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Engineering Financial Safety: A System-Theoretic Case Study from the Financial Crisis , by Melissa Spencer, MIT TPP (Technology and Policy Program) Master's Thesis, May 2012

A Systems Theoretic Application to Design for the Safety of Medical Diagnostic Devices , by Vincent Balgos, MIT SDM Master's Thesis, February 2012, supervised by Dr. Qi van Eikema Hommes

Application of a System Safety Framework in Hybrid Socio-Technical Environment of Eurasia. by Azamat Abdymomunov, MIT SDM Thesis, 2011. This thesis won the "Best SDM Master's Thesis" award at MIT.

A System Theoretic Safety Analysis of Friendly Fire Prevention in Ground Based Missile Systems, by Scott McCarthy, MIT SDM Master's Thesis, January 2013

Accident Analysis and Hazard Analysis for Human and Organizational Factors by Margaret Stringfellow, October 2010

A System Theoretic Analysis of the "7.23" Yong-Tai-Wen Railway Accident . This paper, by Dajiang Suo from the Computer Science and Technology Dept., Tsinghua University, Beijing, China, was presented at the 1st STAMP/STPA Workshop held at MIT on April 26-28, 2012

A Case Study of Vioxx using STAMP by Matthieu Couturier, MIT Technology and Policy Master's Thesis, June 2010.

Updating the Concept of Cause in Accident Investigation, Nancy Leveson, Darren Straker, Shem Malmquist, ISASI (International Society of Air Safety Investigators) 2019, the Hague, Netherlands, Sept. 2019.

Investigating Accidents in Highly Automated Systems: Systemic Problems Identified Through Analysis of Air France 447, ISASI (International Society of Air Safety Investigators) 2019, the Hague, Netherlands, Sept. 2019

Organizational, Managerial, Social Analysis

Technical and Managerial Factors in the NASA Challenger and Columbia Losses: Looking Forward to the Future by Nancy Leveson, in Handelsman and Kleinman (editors), *Controveries in Science and Technology* , University of Wisconsin Press, 2007

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Risk Analysis of NASA Independent Technical Authority by Nancy Leveson and Nicolas Dulac (co-investigators include John Carroll, Joel Cutcher-Gershenfeld, Betty Barrett, David Zipkin) February 2005

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Integrating Safety into an Engineering Contractor's System Engineering Process using the Guidelines of STAMP, by Lorena Pelegrin, Master's Thesis, Herriot-Watt University, August 2012

Leading Indicators

A Systems Approach to Risk Management Through Leading Safety Indicators by Nancy Leveson, *Journal of Reliability Engineering and System Safety*, in press.

Identification of Leading Indicators for Producibility Risk in Early-Stage Aerospace Product Development by Allen J. Ball, MIT Master's Thesis, June 2015.

Cyber Security

Systems-Theoretic Accident Model and Processes (STAMP) Applied to a U.S. Coast Guard Buoy Tender Integrated Control System. by Paul D. Stukus, MIT SDM Masters Thesis, June 2017

An Integrated Approach to Safety and Security Based on Systems Theory by William Young and Nancy Leveson, *Communications of the ACM* , Vol. 57, No. 2, February 2014, pp. 31-35.

Feature Interaction/Integrating Multiple Control Systems

Application of STPA to the Integration of Multiple Control Systems: A Case Study and New Approach , by Matthew Seth Placke, Master's Thesis, Engineering Systems Division, MIT, June 2014

Integration of Multiple Active Safety Systems Using STPA by Seth Placke, John Thomas, and Dajiang Suo, SAE Technical Paper 2015-01-0277, April 2015, doi:10.4271/2015-01-0277

An Integrated Approach to Requirements Development and Hazard Analysis. by John Thomas, John Sgueglia, Dajiang Suo, and Nancy Leveson. SAE Technical Paper 2015-01-0274, April 2015, doi:10.4271/2015-01-0277.

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Other Emergent System Properties

Identification of Leading Indicators for Producibility Risk in Early-Stage Aerospace Product Development by Allen J. Ball, MIT Master's Thesis, June 2015.

Using STPA and CAST to Design for Serviceability and Diagnostics by Hannah M. Slominski, MIT Masters Thesis, System Design and Management, May 2020

A systemic approach toward scalable, reliable and safe satellite constellations by Alan Kharsansky, MS thesis, MIT, SDM Program, August 2020.

SYSTEM ENGINEERING

Safety Analysis in Early Concept Development and Requirements Generation by Nancy G. Leveson

Using STPA and CAST to Design for Serviceability and Diagnostics by Hannah M. Slominski, MIT Masters Thesis, System Design and Management, May 2020

Safety-Guided Design Analysis in Multi-Purposed Japanese Unmanned Transfer Vehicle. by Ryo Ujiie, System Design and Management Master's Thesis, September 2016.

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Requirement Generation for Highly Integrated Aircraft Systems Through STPA: An Application, Andrea Scarinci, Amanda Quilici, Danilo Ribeiro, Felipe Oliveira, Daniel Patrick, and Nancy Leveson, AIAA Information Systems Journal, in press, 2018.

Assuring Safety of NextGen Procedures by Cody H. Fleming, Nancy G. Leveson, M. Seth Placke. Presented at the *Tenth USA/Europe Air Traffic Management Research and Development Seminar (ATM2013).*

Safety-Guided Design of Crew Return Vehicle in the Concept Design Phase using STAMP/STPA by Haruka Nakao, Masa Katahira, Yuko Miyamoto, and Nancy Leveson. This paper was presented at *Conference of the International Association for the Advancement of Space Safety* , Versailles, France, October 2011

Demonstration of a New Dynamic Approach to Risk Analysis for NASA's Constellation Program by Nicolas Dulac, Brandon Owens, Nancy Leveson.

Generating Formal Model-Based Safety Requirements for Complex, Software- and Human-Intensive Systems, by John Thomas and Nancy Leveson, Safety-Critical Systems Club, Bristol, U.K., 2013.

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Integrating Systems Safety into Systems Engineering during Concept Development by Cody Harrison Fleming and Nancy Leveson, Proceedings of the 2015 International Symposium on System Engineering (INCOSE), Seattle, July 2015

Safety-Guided Spacecraft Design using Model-Based-Specifications by Cody Fleming, Takuto Ishimatsu, Yuko Miyamoto, Haruka Nakao, Masa Katahira, Nobuyuki Hoshino, John Thomas, and Nancy Leveson, International Association for the Advancement of Space Safety Conference, Versailles, France, Oct 2011

A systemic approach toward scalable, reliable and safe satellite constellations by Alan Kharsansky, MS thesis, MIT, SDM Program, August 2020.

INTENT SPECIFICATIONS

Intent Specifications: An Approach to Building Human-Centered Specifications, by Nancy Leveson, *IEEE Transactions on Software Engineering ,* Vol. 26, No. 1, January 2000.

Rasmussen's Legacy: A Paradigm Change in Engineering for Safety. by Nancy Leveson, *Applied Ergnomics,* , Special Issue on Reflecting on the Legacy of Jens Rasmussen, in press 2016

Integrating Safety into an Engineering Contractor's System Engineering Process using the Guidelines of STAMP, by Lorena Pelegrin, Master's Thesis, Herriot-Watt University, August 2012

Application of a Safety-Driven Design Methodology to An Outer Planet Exploration Mission by Brandon D. Owens, Margaret Stringfellow Herring, Nicholas Dulac, Nancy Leveson, Michel Ingham, and Kathryn Ann Weiss. *IEEE Aerospace Conference*, Big Sky, Montana, March 2008.

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Example TCAS Intent Specification by Nancy Leveson and Jon Reese.

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Analyzing Software Specifications for Mode Confusion Potential by Nancy Leveson, L. Denise Pinnel, Sean David Sandys, Shuichi Koga, and Jon Damon Reese, First International Workshop on Human Error and System Development, Glascow, March 1997. (An old paper and the notation for the formal specification language used in Intent Specifications, i.e., SpecTRM-RL, has changed, but the ideas are still relevant.)

STANDARDS, REGULATION, CERTIFICATION

Systems Theoretic Process Analysis Applied to Air Force Acquisition Technical Requirements Development by Sarah E. Summers (Major, USAF)

White paper on compliance of STPA with MIL-STD-882E and AMCOM 385-17 by Nancy G. Leveson

The Use of Safety Cases in Certification and Regulation by Nancy Leveson. An earlier version of this paper appeared in the *Journal of System Safety* , Nov/Dec 2011. The version here is updated from that version and includes more material.

The Danger of a "Safety Case" by Nancy G. Leveson (a short essay I wrote while frustrated)

A Comparison of STPA and the ARP 4761 Safety Assessment Process by Nancy Leveson, Chris Wilkinson, Cody Fleming, John Thomas, and Ian Tracy. MIT Technical Report, June 2014

Evaluating the Safety of Digital Instrumentation and Control Systems in Nuclear Power Plants by John Thomas, Francisco Luiz de Lemos, and Nancy Leveson, Research Report: NRC-HQ-11-6-04-0060, November 2012

A Design Process and Certification Strategy for Autonomous Vehicles by Michael Sebastian Schmid, MIT M.S. Thesis, Aeronautics and Astronautics, June 2020

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Software and the Challenge of Flight Control by Nancy Leveson. In *Space Shuttle Legacy: How We Did It/What We Learned* edited by Roger Launius, James Craig, and John Krige, AIAA, 2013.

Engineering Spacecraft Mission Software using a Model-Based and Safety-Driven Design Methodology by Kathryn Anne Weiss, Nicolas Dulac, Stephanie Chiesi, Mirna Daouk, David Zipkin, and Nancy Leveson, AIAA Information Systems Journal, .

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Generating Formal Model-Based Safety Requirements for Complex, Software- and Human-Intensive Systems, by John Thomas and Nancy Leveson, Safety-Critical Systems Club, Bristol, U.K., 2013.

HUMAN FACTORS, HUMAN-AUTOMATION INTERACTION

Engineering for Humans: A New Extension to STPA by Megan Elizabeth France, MIT Aeronautics and Astronautics Masters Thesis, June 2017.

Applying Systems Thinking to Aviation Psychology by Nancy Leveson, in M.A. Vidulich, P.S. Tsang, and J.M. Flach, *Advances in Aviation Psychology: Volume 1*, Ashgate Publishing, 2014

Rasmussen's Legacy: A Paradigm Change in Engineering for Safety. by Nancy Leveson, *Applied Ergnomics,* , Special Issue on Reflecting on the Legacy of Jens Rasmussen, 2016

Extending the Human-Controller Methodology in Systems-Theoretic Process Analysis (STPA), by Cameron L. Thornberry, Master's Thesis, Aeronautics and Astronautics, MIT, June 2014

Using STPA to Inform Developmental Product Testing by Major Daniel R. Montes, U.S. Air Force, MIT Ph.D. Dissertation, February 2016

Incorporating New Methods of Classifying Domain Information for Use in Safety Hazard Analysis. by Nancy Leveson, Daniel Montes, and Leia Stirling. *Proceedings of the International Symposium on Aviation Psychology*, Dayton, Ohio, May 2015

Analyzing Software Specifications for Mode Confusion Potential by Nancy Leveson, L. Denise Pinnel, Sean David Sandys, Shuichi Koga, and Jon Damon Reese, First International Workshop on Human Error and System Development, Glascow, March 1997. (An old paper and the notation for the formal specification language used in Intent Specifications, i.e., SpecTRM-RL, has changed, but the ideas are still relevant.)

Engineering for Humans: A New Extension to System Theoretic Process Analysisby Megan France and John Thomas, Int. Symposium on Aviation Psychology, Dayton Ohio, May 2017

SYSTEM DYNAMICS

Applying System Engineering to Pharmaceutical Safety by Nancy Leveson, Matthieu Couturier, John Thomas, Meghan Dierks, David Wierz, Bruce Psaty, Stan Finkelstein. *Journal of Healthcare Engineering*, Sept. 2012.

Application of Systems-Theoretic Approach to Risk Analysis of High-Speed Rail Project Management in the U.S. , by Soshi Kawakami, MIT Master's Thesis, June 2014.

A Framework for Dynamic Safety and Risk Management Modeling in Complex Systems by Nicolas Dulac, February 2007.

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Demonstration of a New Dynamic Approach to Risk Analysis for NASA's Constellation Program by Nicolas Dulac, Brandon Owens, Nancy Leveson.

COMPARISONS WITH TRADITIONAL APPROACHES

FMEA/FMECA

Application of Systems and Control Theory-Based Hazard Analysis to Radiation Oncology, by Todd Pawlicki, Aubrey Samost, Derek Brown, Ryan Manger, Gwe-Ya Kim, and Nancy Leveson. *Journal of Medical Physics* , in press, 2016

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A Systems Theoretic Application to Design for the Safety of Medical Diagnostic Devices , by Vincent Balgos, MIT SDM Master's Thesis, February 2012, supervised by Dr. Qi van Eikema Hommes

FTA, ARP 4761

Modeling and Hazard Analysis using STPA by Takuto Ishimatsu, Nancy Leveson, John Thomas, Masa Katahira, Yuko Miyamoto, Haruka Nakao. Presented at the *Conference of the International Association for the Advancement of Space Safety*, Huntsville, Alabama, May 2010

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Systems-Theoretic Accident Model and Processes (STAMP) Applied to a U.S. Coast Guard Buoy Tender Integrated Control System. by Paul D. Stukus, MIT SDM Masters Thesis, June 2017

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A New Approach to Hazard Analysis for Rotorcraft by Blake Abrecht, Dave Arterburn, David Horney, Brandon Abel, Jon Schneider, and Nancy Leveson. Proceedings of the 2016 American Helicopter Society Technical Meeting, Huntsville, AL, February 2016

Systems Theoretic Process Analysis Applied to an Offshore Supply Vessel Dynamic Positioning System. by Blake Ryan Abrecht, MIT M.S. in Engineering Systems Thesis, June 2016.

Others

Safety Assurance in NextGen and Complex Transportation Systems by Cody Harrison Fleming, Melissa Spencer, John Thomas, Nancy Leveson, and Chris Wilkinson, *Safety Science,* 55:173-187, 2013.

Comparison of SOAM and STAMP for ATM Incident Investigation by Richard Arnold, Master's Thesis, Lund University, Sweden, 2009, supervised by Prof. Sidney Dekker..

STPA Analysis of NextGen Interval Management Components: Ground Interval Management (GIM) and Flight Deck Interval Management (FIM) by Cody H. Fleming, M. Seth Placke, and Nancy Leveson, FAA and Lincoln Lab, September 2013.

APPLICATIONS

Aviation/Aircraft/Military Aviation

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Improving Hazard Analysis and Certification of Integrated Modular Avionics by Cody Harrison Fleming and Nancy G. Leveson *Journal of Aerospace Information Systems* , Vol. 11, No. 6, June 2014

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Monitoring Safety During Airline Operations: A Systems Approach. by Andrea Scarinci, MIT Masters Thesis, June 2017.

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Systems-Theoretic Process Analysis of Small Unmanned Aerial System Use at Edwards Air Force Base. by Sarah A. Folse, MIT Aeronautics and Astronautices Masters Thesis,June 2017.

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