

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

Type of Analysis

- Hazard Analysis (STPA)
- Accident Analysis (CAST)
- Organizational, Managerial, Social Analysis
- Leading Indicators
- Cyber Security
- Other Emergent System Properties
- Feature Interaction/Integrating Multiple Controllers

System Engineering

Intent Specifications

Standards, Regulations, Certification

Software Engineering

Human Factors/Human-Automation Interaction

System Dynamics

Comparisons with Traditional Approaches (FMEA, FMECA, FTA, ARP 4761, HFACS, MIL-STD-882, etc.)

Applications

- Aviation/Aircraft/Military Aviation
- Airlines
- UAV/UAS
- Air Traffic Control
- Defense/Military (non-aviation)
- Space/Spacecraft
- Naval
- Automotive
- Healthcare/Medical/Pharmaceutical
- Rail
- Workplace Safety
- Nuclear Power
- Petrochemical
- Climate Change
- Financial System

## 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)  
[Table of Contents](#)

[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 Ergonomics*, , 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. Folsie, MIT Aeronautics and Astronautics 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.

[\*\*A Top-Down, Safety-Driven Approach to Architecture Development for Complex Systems\*\*](#), M.S. Thesis, Aeronautics and Astronautics, Justin Poh, S.M. Thesis, Aeronautics and Astronautics, MIT, Feb. 2022.

[\*\*Application of Hierarchy to STPA: A Human Factors Study on Vehicle Automation\*\*](#), Rachel Cabosky, M.S. Thesis, System Design and Management Program, MIT, Sept. 2020.

[\*\*Safety in Hospital Medication Administration: Applying STAMP Processes\*\*](#), Elizabeth White Baker, S.M. Thesis, System Design and Management Program, MIT, Feb. 2022.

[\*\*Safety in US Air Force Tandem Seat Pilot Training: Applying STAMP Processes\*\*](#), Adam Munekata, S.M. Thesis, Aeronautics and Astronautics, May 2022.

### **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.

[\*\*Safety-Guided Design Analysis in Multi-Purposed Japanese Unmanned Transfer Vehicle.\*\*](#) by Ryo Ujiie, System Design and Management Master's Thesis, September 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 Accident Analysis of an Offshore Supply Vessel Collision.\*\*](#) by John Michael Mackovjak, Master of Science in Technology and Policy, MIT, June 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 Safety Analysis of the Sewol-Ho Ferry Accident in South Korea](#) , by Yisug Kwon, MIT Master's Thesis, December 2015.

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

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

[A CAST Analysis of a U.S. Coast Guard Aviation Mishap](#) , by Jon Hickey, MIT Master's Thesis, May 2012, supervised by Dr. Qi van Eikema Hommes.

[Application of CAST to Hospital Adverse Events](#) , by Meaghan O'Neil, MIT Master's Thesis, May 2014

[Application of CAST and STPA to Railroad Safety.](#) , by Aironng Dong, MIT Master's Thesis, May 2012

[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

[Safety in Hospital Medication Administration: Applying STAMP Processes](#), Elizabeth White Baker, S.M. Thesis, System Design and Management Program, MIT, Feb. 2022.

[Enabling Effective Safety Learning in Healthcare: Implementing CAST and Designing the STAMP-Enhanced Learning and Reporting System](#), Lawrence Man Kit Wong, Ph.D. Dissertation, Aeronautics and Astronautics, Sept. 2021.

[Safety in US Air Force Tandem Seat Pilot Training: Applying STAMP Processes](#), Adam Munekata, S.M. Thesis, Aeronautics and Astronautics, May 2022.

### **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), *Controversies in Science and Technology*, University of Wisconsin Press, 2007

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

[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.

[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.

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[A Framework for Dynamic Safety and Risk Management Modeling in Complex Systems](#) by Nicolas Dulac, February 2007.

[Development of a Systematic Risk Management Approach for CO2 Capture, Transport, and Storage Projects](#) by Jaleh Samadi, L'Ecole Nationale Supérieure des Mines de Paris Ph.D. dissertation, December, 2012

[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

[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.

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

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

[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.

[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

### **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.

[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.

[A Systems Approach to Risk Management Through Leading Safety Indicators](#) by Nancy Leveson, *Journal of Reliability Engineering and System Safety*, 136(4):17-34, April 2015.

[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.

[Systems-Theoretic Process Analysis and Safety-Guided Design of Military Systems](#) by David Craig Horney, MIT Aeronautics and Astronautics Masters Thesis, June 2017

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

[Safety-Driven Early Concept Analysis and Development](#) by Cody Harrison Fleming, MIT Ph.D. Dissertation, January 2015

[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, S.M. Thesis, MIT, SDM Program, August 2020.

[A Top-Down, Safety-Driven Approach to Architecture Development for Complex Systems](#), M.S. Thesis, Aeronautics and Astronautics, Justin Poh, S.M. Thesis, Aeronautics and Astronautics, MIT, Feb. 2022.

[Application of Hierarchy to STPA: A Human Factors Study on Vehicle Automation](#), Rachel Cabosky, M.S. Thesis, System Design and Management Program, MIT, Sept. 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 Ergonomics*, 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.

[More details: [Safety-Driven Model-Based System Engineering Methodology Part I: Methodology Description](#) and [Safety-Driven Model-Based System Engineering Methodology Part II: Application of the Methodology to an Outer Planet Exploration Mission](#) by Brandon Owens, Margaret Stringfellow Herring, Nancy Leveson (MIT) and Mitch Ingham, Kathryn Weiss JPL). December 2007]

[Safety Assurance in NextGen](#) by Cody Harrison Fleming, Melissa Spencer, Nancy Leveson, and Chris Wilkinson, NASA Research Report NASA/CR-2012-217553

[Example TCAS Intent Specification](#) by Nancy Leveson and Jon Reese.



[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.

[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

[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, Glasgow, 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

## SOFTWARE ENGINEERING

[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, .

[Software Challenges in Achieving Space Safety](#) by Nancy Leveson. *Journal of the British Interplanetary Society*, Vol. 62, 2009

[A Systems-Theoretic Approach to Safety in Software-Intensive Systems](#) by Nancy Leveson. *IEEE Trans. on Dependable and Secure Computing*, January 2005.

[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

[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 Ergonomics*, 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, Glasgow, 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 Analysis](#) by Megan France and John Thomas, Int. Symposium on Aviation Psychology, Dayton Ohio, May 2017

[A Top-Down, Safety-Driven Approach to Architecture Development for Complex Systems](#), M.S. Thesis, Aeronautics and Astronautics, Justin Poh, S.M. Thesis, Aeronautics and Astronautics, MIT, Feb. 2022.

## 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.

[Development of a Systematic Risk Management Approach for CO2 Capture, Transport, and Storage Projects](#) by Jaleh Samadi, L'Ecole Nationale Supérieure des Mines de Paris Ph.D. dissertation, December, 2012

[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

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

[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

[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

#### Root Cause Analysis

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