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Rational Accidents

Reckoning with Catastrophic Technologies

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REFERENCES

- Abernathy, W., and Utterback, J. (1978). "Patterns of Industrial Innovation." *Technology Review* 50: 41–47.
- Acohido, B. (1991). "Boeing Co. Pushing the 'Envelope'—Could Early Stops Erode 777's Margin of Safety?" *Seattle Times*, April 21. <http://community.seattletimes.nwsourc.com/archive/?date=19910421&slug=1278761> (accessed December 2, 2015).
- Acohido, B. (1996). "Pittsburgh Disaster Adds to 737 Doubts," *Seattle Times*, October 29.
- Acton, J., and Hibbs, M. (2012). "Fukushima Could Have Been Prevented." *New York Times*, March 9, 2012. <https://www.nytimes.com/2012/03/10/opinion/fukushima-could-have-been-prevented.html> (accessed August 8, 2018).
- Aerospace Industries Association of America, Inc. (AIAA). (September 1989). "Maintaining a Strong Federal Aviation Administration: The FAA's Important Role in Aircraft Safety and the Development of US Civil Aeronautics." Washington, D.C.: Aerospace Research Center.
- Ahmed, H. and Chateaufneuf, A. (2011). "How Few Tests Can Demonstrate the Operational Reliability of Products." *Quality Technology & Quantitative Management* 8: 411–428.
- Air Accidents Investigation Branch (AAIB). (February 1976). "Turkish Airlines DC-10, TC-JAV. Report on the Accident in the Ermenonville Forest, France, on March 3, 1974." UK Air Accidents Investigation Branch.
- Air Accidents Investigation Branch (AAIB). (1989). "Report on the Accident to Concorde 102, G-BOAF over the Tasman Sea, about 140 nm East of Sydney, Australia, on 12 April 1989." Report No: 6/1989. Department of Transport. Her Majesty's Stationery Office: London.
- Air Accidents Investigation Branch (AAIB). (1990). "Report on the Accident to Boeing 737-400 G-OBME near Kegworth, Leicestershire, on 8 January 1989." Aircraft Accident Report 4/90. Air Accidents Investigation Branch. Department of Transport. London.

Air Accidents Investigation Branch (AAIB). (1993). "Report on the Accident to British Aircraft Corporation/SNIAS Concorde 102, G-BOAB, over the North Atlantic, on 21 March 1992." Report No: 5/1993. Department of Transport. Her Majesty's Stationery Office: London.

Airbus. (2017). "A Statistical Analysis of Commercial Aviation Accidents 1958/2017." <https://www.airbus.com/content/dam/corporate-topics/publications/safety-first/Airbus-Commercial-Aviation-Accidents-1958-2017.pdf> (accessed March 1, 2019).

Airline Pilots Association International (ALPA). (March 1999). "Comments on Rules Docket (AGC-200) Docket No. FAA-1998-4815 (52539)."

Airsafe. (2008). "Significant Safety Events for Air Transit." Airsafe.com, February 2, 2008. <http://www.airsafe.com/events/airlines/transat.htm> (accessed July 1, 2015).

Airsafe. (2010). "Boeing 747 Plane Crashes." Airsafe.com. <http://www.airsafe.com/events/models/boeing.htm> (accessed April 10, 2010).

Airsafe. (2020). "Plane Crash Rates by Model." Airsafe.com. http://www.airsafe.com/events/models/rate_mod.htm (accessed July 28, 2020).

Air Safety Week. (2001). "Past Achievements in Safety No Grounds for Complacency." *Air Safety Week*, Monday, August 20.

Air Safety Week. (2005). "Hercules Crash in Baghdad Points to Metal Fatigue in C130's Wing Center." *Air Safety Week*, February 21, 2005.

Air Transport Action Group (ATAG). (April, 2014). "Aviation Benefits beyond Borders." <http://aviationbenefits.org/downloads/> (accessed September 15, 2015).

Allen, J. (2004). "Joseph P. Allen Interviewed by Jennifer Ross-Nazzal; Washington DC; 18 March 2004." NASA Johnson Space Center Oral History Project, *Oral History 3 Transcript*. https://historycollection.jsc.nasa.gov/JSCHistoryPortal/history/oral_histories/AllenJP/AllenJP_3-18-04.htm (accessed March 10, 2023).

American Nuclear Society. (March 12, 2011). "Japanese Earthquake/Tsunami; Problems with Nuclear Reactors." http://209-20-84-91.slicehost.net/assets/2011/3/13/ANS_Japan_Backgrounder.pdf (accessed June 19, 2013).

Anderson, A. (2011). "Aviation Safety: Evolution of Airplane Interiors." *Boeing Aeromagazine*. https://www.boeing.com/commercial/aeromagazine/articles/2011_q4/pdfs/AERO_2011q4_article2.pdf (accessed May 19, 2018).

Apostolakis, G. E. (1988). "The Interpretation of Probability in Probabilistic Safety Assessments." *Reliability Engineering & System Safety* 23(4): 247-252.

Apostolakis, G. E. (1990). "The Concept of Probability in Safety Assessments of Technological Systems." *Science* 250(4986): 1359-1364.

Apostolakis, G. E. (2004). "How Useful Is Quantitative Risk Assessment?" *Risk Analysis* 24(3): 515-520.

Arrow, K. J. (1962). "The Economic Implications of Learning by Doing." *Review of Economic Studies* 29(3): 155-173.

Arthur, B. (1989). "Competing Technologies, Increasing Returns, and Lock-in by Historical Events." *Economic Journal* 99: 116-131.

Arthur, B. (2009). *The Nature of Technology: What It Is and How It Evolves*. New York: Free Press.

Associated Press. (2009). "History of the Boeing 787." *Seattle Times*, June 23, 2009. https://web.archive.org/web/20130606210919/http://seattletimes.com/html/nationworld/2009373399_apusb Boeing787historyglance.html (accessed April 4, 2019).

Aubury, M. (1992) "Lessons from Aloha." *BASI Journal*, June 1992. http://www.iasa.com.au/folders/Safety_Issues/others/lessonsfromaloha.html (accessed March 10, 2023).

Australian Transport Safety Bureau (ATSB). (2007). "In-flight Upset Event 240 km North-west of Perth, WA Boeing Company 777-200, 9M-MRG 1 August 2005." *Aviation Occurrence Report—200503722*. http://www.atsb.gov.au/publications/investigation_reports/2005/AAIR/aaair200503722.aspx (accessed July 7, 2015).

Australian Transport Safety Bureau (ATSB). (June 27, 2013). "Final Investigation Report, AO-2010-089—In-flight Uncontained Engine Failure Overhead Batam Island, Indonesia 4 November 2010 VH-OQA Airbus A380-842." *ATSB Transport Safety Report*. Canberra.

Aviation Safety & Security Digest. (January 2, 2009). "Safety of Composite Structures Being Evaluated after Aircraft Design Already Approved by FAA." *Aviation Safety & Security Digest*.

Aviation Week and Space Technology. (January 24, 1990). "Composites May Cut Costs." *Aviation Week and Space Technology*.

Bainbridge, L. (1983). "Ironies of Automation." *Automatica* 19(6): 775–777.

Barcott, B. (2009). "The Role of Suburban Sprawl." *New York Times*, January 16.

Barker, I. (2006). "Composite Planes" Letter to the Editor. *New Scientist*, August 30, 2006. <https://www.newscientist.com/letter/mg19125673-200-composite-planes/> (accessed August 9, 2016).

Barlay, S. (1990). *The Final Call: Why Airline Disasters Continue to Happen*. New York: Pantheon Books.

Barrie, D. (2003). "Boeing Targets Its 7E7 at Mid-Market Gap." *Aviation Week and Space Technology*, February 3, 2003.

Baxandall, M. (1985). *Patterns of Intention: On the Historical Explanation of Pictures*. New Haven, CT: Yale University Press.

Bazerman, M. H., and Watkins, M.D. (2004). *Predictable Surprises: The Disasters You Should Have Seen Coming and How to Prevent Them*. Boston: Harvard Business School Press.

Bazovsky, I. (1961). *Reliability Theory and Practice*. Hoboken, NJ: Prentice-Hall.

BBC. (2015). "AirAsia Crash: Faulty Part 'Major Factor'." *News Online*, December 1, 2015. Online: <https://www.bbc.co.uk/news/world-asia-34972263> (accessed May 5, 2018).

Beatson, J. (1989). "Air Safety: Is America Ready to 'Fly By Wire'?" *Washington Post*, April 2, 1989. <https://www.washingtonpost.com/archive/opinions/1989/04/02/air>

-safety-is-america-ready-to-fly-by-wire/029882be-28cb-4f56-8fe4-1f48e333eb58/?noredirect=on&utm_term=.9d8718964e33 (accessed April 4, 2019).

Beck, U. (1992). *Risk Society: Towards A New Modernity*. London: SAGE.

Beck, U. (1999). *World Risk Society*. London: Polity Press.

Benaroya, H. (2018). *Building Habitats on the Moon: Engineering Approaches to Lunar Settlements*. London: Springer.

Berguin, H. S., Renganathan, A., Ahuja, J., Chen, M., Perron, C., Tai, J. and Mavris, D. (2018). *CFD Study of an Over-Wing Nacelle Configuration*. Airbus Technical Report No. 1853/60464. October.

Bier, V., Joosten, J. Glyer, D. Tracey, J., and Welsh, M. (2003). *Effects of Deregulation on Safety: Implications Drawn from the Aviation, Rail, and United Kingdom Nuclear Power Industries*. New York: Springer Science & Business Media.

Bijker, W. Hughes, T., and Pinch, T. (Eds.) (1989). *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge, MA: MIT Press.

Bishop, P. G. (1995). "Software Fault Tolerance by Design Diversity." In Lyu, M. (Ed.), *Software Fault Tolerance*, 211–229. Hoboken, NJ: John Wiley & Sons.

Blastland, M., and Spiegelhalter, D. (2013). *The Norm Chronicles: Stories and Numbers about Danger*. London: Profile Books.

Blockley, D. (2012). *Engineering: A Very Short Introduction*. Oxford: Oxford University Press.

Bloor, D. (1976). *Knowledge and Social Imagery*. London: Routledge & Kegan Paul.

Bó, E. D. (2006). "Regulatory Capture: A Review." *Oxford Review of Economic Policy* 22(2): 203–225.

Bohn, R. E. (2005). "From Art to Science in Manufacturing: The Evolution of Technological Knowledge." *Foundations and Trends in Technology, Information and Operations Management* 1(2): 1–82.

Bokulich, F. (2003). "Birdstrikes Remain a Concern for Pilots." *Technology Update*, May 11. http://www.sae.org/aeromag/techupdate_3-00/05.htm. (accessed July 3, 2012).

Bonnín Roca, J., Vaishnav, P., Morgan, M. G., Mendonça, J., and Fuchs, E. (2017). "When Risks Cannot Be Seen: Regulating Uncertainty in Emerging Technologies." *Research Policy* 46(7): 1215–1233.

Boston, C. (2019). "Hedge Funds Resurrect CDO Trade. This Time They Say It Will Work." *Bloomberg*, May 2. <https://www.bloomberg.com/news/articles/2019-05-02/hedge-funds-resurrect-cdo-trade-this-time-they-say-it-will-work> (accessed September 14, 2021).

Bostrom, N. (2014) *Superintelligence: Paths, Dangers, Strategies*. Oxford: Oxford University Press.

Bowker, G., and Star, S.L. (2000). *Sorting Things Out: Classification and Its Consequences*. Cambridge, MA: MIT Press.

- Briddon, A. Ellmore, C., and Marraine, P. (1974). *FAA Historical Fact Book: A Chronology 1926–1971*. Washington, DC: US Government Printing Office.
- Brown, D. P. (2009). "All Nippon Airways Wants Passengers to Use the Bathroom before Boarding." *AirlineReporter*, October 13, 2009. <https://www.airlinereporter.com/2009/10/all-nippon-airways-wants-passengers-to-use-the-bathroom-before-boarding/> (accessed September 22, 2016).
- Bruce, J. T., and Draper, J. (1970). *[The NaderReport on] Crash Safety in General Aviation Aircraft*. Washington, DC: Center for Study of Responsive Law.
- Bucciarelli, L. (1994). *Designing Engineers*. Cambridge, MA: MIT Press.
- Budgey, R. (1999). "Three-Dimensional Bird Flock Structure and Its Implications for Birdstrike Tolerance in Aircraft." Paper delivered to International Bird Strike Committee, September 1999 (IBSC24/ WP 12).
- Budgey, R. (2000). "The Development of a Substitute Artificial Bird By the International Birdstrike Research Group for Use in Aircraft Component Testing." International Bird Strike Committee IBSC25/WP-IE3, Amsterdam: 17–21.
- Bugos, G. (1996). *Engineering the F4 Phantom II: Parts into Systems*. Annapolis, MD: Naval Institute Press.
- Bureau Enquetes-Accidents (BEA). (June 1980). "Rapport D'Enquete Concernant L'Incident Survenu le 14 Juin 1979 a Washington-Dulles (Etats-Unis) au Concorde No. 9 Immatriculre F-BVFC." Paris: Ministere Des Transports.
- Bureau Enquêtes-Accidents (BEA). (January 2002). "Accident on 25 July 2000 at La Patte d'Oie in Gonesse (95) to the Concorde Registered F-BTSC Operated by Air France." Report translation f-sc000725a. Paris: Ministere Des Transports.
- Bureau Navigabilite des Moteurs et Equipements (BNME). (1999). "Commentaires NPRM 98-1 9." Bureau Navigabilite Des Moteurs et Equipements, Docket No FAA-98-2815-10 (53165), March 31.
- Burnie, S. (2017). "Fukushima Bill." *Asia Times*, March 31, 2017. <http://www.atimes.com/article/tepcos-fukushima-expensive-industrial-accident-history/> (accessed July 25, 2017).
- Burrows, W. (2010). *This New Ocean: The Story of the First Space Age*. London: Random House.
- Butler, R., and Finelli, G. (1993). "The Infeasibility of Experimental Quantification of Life-Critical Software reliability." *IEEE Transactions on Software Engineering* 19(1): 3–12.
- Calder, S. (2018). "Airline Safety: 2017 Was Safest Year in History for Passengers around World, Research Shows." *The Independent*, January 1. <https://www.independent.co.uk/travel/news-and-advice/air-safety-2017-best-year-safest-airline-passengers-worldwide-to70-civil-aviation-review-a8130796.html> (accessed September 21, 2018).
- Calma, J. (2020). "Offshore Drilling Has Dug Itself a Deeper Hole." *The Verge*, April 20. <https://www.theverge.com/2020/4/20/21228577/offshore-drilling-deepwater-horizon-10-year-anniversary> (accessed September 9, 2021).

- Cannon, R., and Zimmermann, R. (1985). "Seat Experiments for the Full-Scale Transport Aircraft Controlled Impact Demonstration." DOT/FAA/CT-84/10 March. Atlantic City, NJ: Federal Aviation Administration Technical Center.
- Capaccio, T. (1997). "The B-2's Stealthy Skins Need Tender, Lengthy Care." *Defense Week*, May 27, 1997: 1.
- Capaccio, T. (2019). "Stagnant F-35 Reliability Means Fewer Available Jets: Pentagon." *Bloomberg Government*. <https://about.bgov.com/news/stagnant-f-35-reliability-means-fewer-available-jets-pentagon/> (accessed March 14, 2019).
- Chaplin, J. C. (2011). "Safety Regulation—The First 100 Years." *Journal of Aeronautical History* 3: 75–96.
- Chaturvedi, A. K. (2010). "Aviation Combustion Toxicology: An Overview." *Journal of Analytical Toxicology* 34: 1–16.
- Chatuverdi, A., and Sanders, D. (February 1995). Aircraft Fires, Smoke Toxicity, and Survival: An Overview. CAMI Report No. 95/8. Oklahoma City: Civil Aeromedical Institute.
- Chokshi, N. (2020). "Airlines May Learn to Love the Boeing 737 Max Again." *New York Times*, July 15. <https://www.nytimes.com/2020/07/15/business/boeing-737-max-return.html> (accessed July 7, 2020).
- Civil Aviation Authority (CAA). (2013). "Global Fatal Accident Review: 2002 to 2011." CAP 1036. London: Stationery Office.
- Clarke, J. D. (2017 [1972]). *Ignition! An Informal History of Rocket Propellants*. New Brunswick, NJ: Rutgers University Press.
- Clarke, L. (1989). *Acceptable Risk? Making Decisions in a Toxic Environment*. Berkeley: University of California Press.
- Clarke, L. (2005). *Worst Cases: Terror and Catastrophe in the Popular Imagination*. Chicago: University of Chicago Press.
- Clarke, L., and Perrow C. (1996). "Prosaic Organizational Failure." *American Behavioral Scientist* 39(8): 1040–1056.
- Cleary, E. C., Dolbeer, R. A., and Wright, S. E. (2006). "Wildlife Strikes to Civil Aircraft in the United States, 1990–2005." Washington, DC: US Department of Transportation, Federal Aviation Administration, Office of Airport Safety and Standards.
- Cobb, R., and Primo, D. (2003). *The Plane Truth: Airline Crashes, the Media, and Transportation Policy*. Washington, DC: Brookings Institution Press.
- Cohen, M., March, J., and Olsen, J. (1972). "A Garbage Can Model of Organizational Choice." *Administrative Science Quarterly* 17 (1): 1–25.
- Collins, H. (1981). "The Place of the 'Core-Set' in Modern Science: Social Continuity with Methodological Propriety in Science." *History of Science* (19): 6–19.
- Collins, H. (1982). "Tacit Knowledge and Scientific Networks." In Barnes B. and Edge D. (Eds.), *Science in Context: Readings in the Sociology of Science*, 44–64. Milton Keynes, UK: Open University Press.

- Collins, H. (1985). *Changing Order*. London: SAGE.
- Collins, H. (1988). "Public Experiments and Displays of Virtuosity: The Core-Set Revisited." *Social Studies of Science* 18(4): 725–748.
- Collins, H. (2001). "Tacit Knowledge and the Q of Sapphire." *Social Studies of Science* 31(1): 71–85.
- Collins, H. (2010). *Tacit and Explicit Knowledge*. Chicago, IL: University of Chicago Press.
- Collins, H., and Evans, R. (2002). "The Third Wave of Science Studies: Studies of Expertise and Experience." *Social Studies of Science* 32(2): 235–296.
- Collins, H., Evans, R., and Weinel, M. (2017). "STS as Science or Politics?" *Social Studies of Science* 47(4): 587–592.
- Collins, H., and Pinch, T. (1993). *The Golem: What Everyone Should Know about Science*. Cambridge: Cambridge University Press.
- Collins H., and Pinch, T. (1998). *The Golem at Large: What You Should Know about Technology*. Cambridge: Cambridge University Press.
- Constant, E. (1980). *The Origins of the Turbojet Revolution*. Baltimore: Johns Hopkins University Press.
- Constant, E. (1999). "Reliable Knowledge and Unreliable Stuff: On the Practical Role of Unreliable Beliefs." *Technology and Culture* 40(2): 324–357.
- Coppola, A. (1984). "Reliability Engineering of Electronic Equipment: An Historical Perspective." *IEEE Transactions on Reliability* R-33(1): 29–35.
- Cowen, H. (1972). "Fairey Fly-by-Wire." *Flight International*, August 10, 1972: 193.
- Crane, D. (1997). *Dictionary of Aeronautical Terms*, 3rd ed. Newcastle, WA: Aviation Supplies & Academics.
- Croft, J. (2009). "NTSB, FAA Investigate High Altitude Bird Strikes Near Phoenix." *FLightGlobal*, November 6, 2009. <https://www.flightglobal.com/news/articles/ntsb-faa-investigate-high-altitude-bird-strikes-nea-334523/> (accessed June 18, 2018).
- Cronrath, E. M. (2017). *The Airline Profit Cycle: A System Analysis of Airline Industry Dynamics*. London: Routledge.
- Cushman, J. (1989). "U.S. Investigators Fault Aloha Line in Fatal Accident." *New York Times*, May 24.
- Dana, D., and Koniak, S. (1999). "Bargaining in the Shadow of Democracy." *University of Pennsylvania Law Review* 148(2): 473–559.
- David, P. A. (1985). "Clio and the Economics of QWERTY." *American Economic Review Papers and Proceedings* 75: 332–337.
- Davies, R. (1986). "The Effect of the Accident at Chernobyl upon the Nuclear Community." *Science, Technology, & Human Values* 11(4): 59–63.
- Davies, R., and Birtles, P. J. (1999). *Comet: The World's First Jet Airliner*. Richmond, VA: Paladwr Press.

de Briganti, G. (2016). "Navair Sees F-35 Requiring up to 50 Maintenance Hours per Flight Hour." *Defense-Aerospace*, December 5, 2016. http://www.defense-aerospace.com/articles-view/feature/5/179243/navair-projects-f_35-to-need-50-maintenance-hours-per-flight-hour.html (accessed March 10, 2019).

Dedman, B. (2011). "What Are the Odds? US Nuke Plants Ranked by Quake Risk." NBC News. http://www.nbcnews.com/id/42103936/ns/world_news-asiapacific/ (accessed May 17, 2017).

Dekker, S. (2011). *Drift into failure. From hunting broken components to understanding complex systems*. Aldershot, UK: Ashgate: Ashgate.

Desrosieres, A. (1998). *The Politics of Large Numbers: A History of Statistical Reasoning*. Cambridge, MA: Harvard University Press.

DeVault, T. L., Blackwell, B. F., Seamans, T. W., Lima, S. L. and Fernández-Juricic, E. (2014). "Effects of Vehicle Speed on Flight Initiation by Turkey Vultures: Implications for Bird-Vehicle Collisions." *PLoS One* 9(2): e87944.

DeVault, T. L., Blackwell, B. F., Seamans, T. W., Lima, S. L., and Fernández-Juricic, E. (2015). "Speed Kills: Ineffective Avian Escape Responses to Oncoming Vehicles." *Proceedings. Biological Sciences/The Royal Society* 282(1801): 20142188.

Dolbeer, R. (2007). "Bird Damage to Turbofan and Turbojet Engines in Relation to Phase of Flight—Why Speed Matters." *Bird and Aviation* 27(2): 1–7.

Dolbeer, R., and Eschenfelder, P. (2003). "Amplified Bird-Strike Risks Related to Population Increases of Large Birds in North America." *Proceedings of the 26th International Bird Strike Committee meeting (Volume 1)*. Warsaw, Poland: 49–67.

Donin, R. (1976). "Safety Regulation of the Concorde Supersonic Transport: Realistic Confinement of the National Environmental Policy Act." *Transportation Law Journal* 8: 47–69.

Douglas, M., and Wildavsky, A. B. (1982). *Risk and Culture: An Essay on the Selection of Technical and Environmental Dangers*. Berkeley: University of California Press.

Downer, J. (2007). "When the Chick Hits the Fan: Representativeness and Reproducibility in Technological Testing." *Social Studies of Science* 37(1): 7–26.

Downer, J. (2009a). "Watching the Watchmaker: On Regulating the Social in Lieu of the Technical." *LSE CARR Discussion Paper 54*, June. <http://eprints.lse.ac.uk/36538/> (accessed March 10, 2023).

Downer, J. (2009b). "When Failure Is an Option: Redundancy, Reliability, and Risk." *LSE CARR Discussion Paper 53*, May. <https://eprints.lse.ac.uk/36537/1/Disspaper53.pdf> (accessed March 10, 2023).

Downer, J. (2010). "Trust and Technology: The Social Foundations of Aviation Regulation." *British Journal of Sociology* 61(1): 87–110.

Downer, J. (2011a). "On Audits and Airplanes: Redundancy and Reliability-Assessment in High Technologies." *Accounting, Organizations and Society* 36(4): 269–283.

Downer, J. (2011b). "'737-Cabriolet': The Limits of Knowledge and the Sociology of Inevitable Failure." *American Journal of Sociology* 117(3): 725–762.

- Downer, J. (2014). "Disowning Fukushima: Managing the Credibility of Nuclear Reliability Assessment in the Wake of Disaster." *Regulation & Governance* 8: 287–309.
- Downer, J. (2015). "The Unknowable Ceilings of Safety: Three Ways That Nuclear Accidents Escape the Calculus of Risk Assessments." In Taebi, B. and Roeser, S. (Eds.), *The Ethics of Nuclear Energy: Risk, Justice and Democracy in the Post-Fukushima Era*, 35–52. Cambridge: Cambridge University Press.
- Downer, J. (2016). "Resilience in Retrospect: Interpreting Fukushima's Disappearing Consequences." In Herwig, A. and Simoncini, M. (Eds.), *Law and the Management of Disasters: The Challenge of Resilience*, 42–60. London: Routledge.
- Downer, J. (2020). "On Ignorance and Apocalypse: A Brief Introduction to 'Epistemic Accidents.'" In LeCoze, J. C. (Ed.) *New Perspectives on Safety Research*. Boca Raton, FL: CDC Press.
- Downer, J., and Ramana, M.V. (2021). "Empires Built on Sand: On Reactor Safety Assessment and Regulation." *Regulation & Governance* 15(1): 1304–1325.
- Drier, M. (2020). "Cormorants Damaging Fish Populations." *Huron Daily Tribune*, February 29. <https://www.michigansthum.com/news/article/Cormorants-damaging-fish-populations-15092892.php> (accessed August 4, 2020).
- Duffy, C. (2020). "Boeing Has Uncovered Another Potential Design Flaw with the 737 Max." *CNN Business*, January 6. <https://edition.cnn.com/2020/01/05/business/boeing-737-max-wiring-issue/index.html> (accessed July 7, 2020).
- Dumas, L. (1999). *Lethal Arrogance: Human Fallibility and Dangerous Technologies*. New York: St. Martin's Press.
- Dvorak, P. (2012a). "Fukushima Daiichi's Achilles Heel: Unit 4's Spent Fuel?" *Wall Street Journal*, April 17. <http://blogs.wsj.com/japanrealtime/2012/04/17/fukushima-daiichis-achilles-heel-unit-4s-spent-fuel> (accessed September 15, 2013).
- Dvorak, P. (2012b). "Fukushima Daiichi's Unit 4 Spent-Fuel Pool: Safe or Not?" *Wall Street Journal* (Japan), April 17. <http://blogs.wsj.com/japanrealtime/2012/05/21/fukushima-daiichis-unit-4-spent-fuel-pool-safe-or-not/> (accessed August 5, 2013).
- Eckhard, D., and Lee, L. (1985). "A Theoretical Basis of Multiversion Software Subject to Coincident Errors." *IEEE Transactions on Software Engineering* 11: 1511–1517.
- Edge, C. E., and Degriek, J. (1999). "Derivation of a Dummy Bird for Analysis and Test of Airframe Structures." *1999 Bird Strike Committee-USA/Canada, First Joint Annual Meeting, Vancouver, BC*. Paper 14. <http://digitalcommons.unl.edu/birdstrike1999/14> (accessed March 10, 2023).
- Edmondson, A. C. (2011). "Strategies for Learning from Failure." *Harvard Business Review*, April 2011. <http://www.preemptivetesting.com/resources/Strategies%20for%20Learning%20from%20Failure.pdf> (accessed April 1, 2019).
- Endres, G. (1998). *McDonnell Douglas DC-10*. St. Paul, MN: MBI Publishing Company.
- Erikson, K. (1991). "Radiation's Lingering Dread." *Bulletin of the Atomic Scientists* 47(2): 34–39.
- Eschenfelder, P. (2000). "Jet Engine Certification Standards." Paper delivered to International Bird Strike Committee, April 17–21 (IBSC25/WP-IE1).

- Eschenfelder, P. (2001). "Wildlife Hazards to Aviation." Paper delivered to ICAO/ACI Airports Conference. Miami, April 24.
- Espeland, W., and Stevens, M. (2008). "A Sociology of Quantification." *European Journal of Sociology* 49: 401–436.
- European Transport Safety Council (ETSC). (December 1996). "Increasing the Survival Rate in Accident Conditions: Impact Protection, Fire Survivability and Evacuation." European Transport Safety Council. Brussels.
- Ezrahi, Y. (2008). "Technology and the Civil Epistemology of Democracy." *Inquiry* 35(3–4): 363–376.
- Ezrahi, Y. (2012). *Imagined Democracies: Necessary Political Fictions*. New York: Cambridge University Press.
- Fackler, M. (2012). "Nuclear Crisis Set off Fears over Tokyo, Report Says." In *New York Times*, February 27, 2012. http://www.nytimes.com/2012/02/28/world/asia/japan-considered-tokyo-evacuation-during-the-nuclear-crisis-report-says.html?_r=1 (accessed February 8, 2012).
- Faith, N. (1996). *Black Box*. London: Boxtree.
- Fallows, J. (1985). "The American Army and the M-16 Rifle." In MacKenzie, D. and Wajcman, J. (Eds.), *The Social Shaping of Technology*, 2nd ed., 382–394. Buckingham, UK: Open University Press.
- Favre, C. (1996). "Fly-By-Wire for Commercial Aircraft: The Airbus Experience." In Tischler, M. (Ed.), *Advances in Aircraft Flight Control*. UK: Taylor & Francis.
- Fanfalone, M. (2003). *Testimony to the House Aviation Subcommittee: On FAA Reauthorization*. March 27. http://www.findarticles.com/p/articles/mi_m0UBT/is_17_17/ai_100769720#continue.
- Federal Register*. (1998). "Proposed Rules." Vol. 63, No. 238. December 11: 68641–68644.
- Feeler, R. A. (1991). "The Mechanic and Metal Fatigue." *Aviation Mechanics Bulletin*. Flight Safety Foundation. March/April: 1–2.
- Feris, M. A. (2003). "It's Murder on the Runways at SA's Airports." *Cape Argus*, September 1.
- Feyerabend, P. (1975). *Against Method: Outline of an Anarchistic Theory of Knowledge*. London: Redwood Burn.
- Feyerabend, P. (1995). *Killing Time: The Autobiography of Paul Feyerabend*. Chicago: Chicago University Press.
- Fiorino, F. (2009). "Survival Is the Rule." *New York Times*, January 16.
- Fleck, J. (1994). "Learning by Trying: The Implementation of Configurational Technology." *Research Policy* 23: 637–652.
- Flight Safety Foundation. (1994). "Getting out Alive—Would Smoke Hoods Save Airline Passengers or Put Them at Risk?" *Cabin Crew Safety* 29(1): 1–24.
- Flight Safety Foundation. (2018). "Fatal Accidents per Year 1946–2017." *Aviation Safety Network*. <https://aviation-safety.net/statistics/> (accessed October 10, 2018).

- Fraher, A. (2014). *The Next Crash: How Short-Term Profit-Seeking Trumps Airline Safety*. New York: Cornell University Press.
- Francis, John (1993) *The Politics of Regulation: A Comparative Perspective*. Oxford: Blackwell.
- Freeman, C., and Perez, C. (1988). "Structural Crises of Adjustment, Business Cycles, and Investment Behavior." In Dosi, G., Freeman, C., Nelson, R., Silverberg, G. and Soete, L. (Eds.), *Technical Change and Economic Theory*, 38–66. London: Francis Pinter.
- Froud, J., Sukhdev, J., Leaver, A., and Williams, K. (2006). *Financialization and Strategy: Narratives and Numbers*. London: Routledge.
- Fukushima Nuclear Accident Independent Investigation Commission (NAIIC). (2012). "The Official Report of the Fukushima Nuclear Accident Independent Investigation Commission (Executive Summary)." Tokyo: National Diet of Japan. http://www.nairc.org/fukushima/naaic_report.pdf (accessed July 16, 2013).
- Fuller, J. (1976). *We Almost Lost Detroit*. New York: Ballantine Books.
- Galison, P. (1987). *How Experiments End*. Chicago: University of Chicago Press.
- Galison, P. (2000). "An Accident of History." In Galison, P. and Roland, A. (Eds.), *Atmospheric Flight in the Twentieth Century*, 3–43. Boston, Kluwer.
- Gapper, J. (2014). "The Price of Innovation Is Too High in Aerospace." *Financial Times*, July 16. <http://www.ft.com/intl/cms/s/0/7ab776a2-0ce0-11e4-bf1e-00144feabdc0.html> (accessed August 26, 2015).
- Garrison, P. (2005). "When Airplanes Feel Fatigued." *Flying*, September. <https://www.flyingmag.com/when-airplanes-feel-fatigued/> (accessed March 10, 2023).
- Gates, D. (2007). "Fired Engineer Calls 787's Plastic Fuselage Unsafe." *Seattle Times*, September 18. http://old.seattletimes.com/html/boeingaerospace/2003889663_boeing180.html (accessed April 4, 2019).
- Gelles, D. (2019). "Boeing Can't Fly Its 737 Max, but It's Ready to Sell Its Safety." *New York Times*, December 24.
- Gephart, R., Van Maanen, J., and Oberlechner, T. (2009) "Organizations and Risk in Late Modernity." *Organization Studies* 30(2/3): 141–155.
- Gerard, D., and Lave, L. B. (2005). "Implementing Technology-Forcing Policies: The 1970 Clean Air Act Amendments and the Introduction of Advanced Automotive Emissions Controls in the United States." *Technological Forecasting and Social Change* 72(7): 761–778.
- Gilligan, A. (2016). "Fukushima: Tokyo Was on the Brink of Nuclear Catastrophe, Admits Former Prime Minister." *The Telegraph*, March 4, 2016. <https://www.telegraph.co.uk/news/worldnews/asia/japan/12184114/Fukushima-Tokyo-was-on-the-brink-of-nuclear-catastrophe-admits-former-prime-minister.html> (accessed August 8, 2018).
- Gillman, P. (January 1977). "Supersonic Bust: The Story of the Concorde." *Atlantic Monthly* 239(1): 72–81.
- Goodspeed, P. (2012). "Japan Feared Post-Tsunami 'Devils Chain Reaction.'" *National Post*, February 28. <http://fullcomment.nationalpost.com/2012/02/28/peter-goodspeed>

-japanese-officials-feared-post-tsunami-devils-chain-reaction-would-destroy-tokyo-report-finds/ (accessed July 9, 2013).

Gordon, J. E. (2018 [1991]). *Structures: Or Why Things Don't Fall Down*. London: Penguin Books Ltd.

Gorton, G. (2012). *Misunderstanding Financial Crises: Why We Don't See Them Coming*. Oxford: Oxford University Press.

Graeber, D. (2015). *The Utopia of Rules: On Technology, Stupidity, and the Secret Joys of Bureaucracy*. London: Melville House.

Graffeo, E. (2021) "Warren Buffett Warned 18 Years Ago about the Financial Instruments that Triggered the Archegos Implosion." *Business Insider*. April 2, 2021. <https://markets.businessinsider.com/news/stocks/warren-buffett-archegos-implosion-warning-derivatives-total-return-swaps-lethal-2021-4-1030272114> (accessed March 12, 2023).

Gritta, R., Adrangi, B., and Davalos, S. (2006). "A Review of the History of Air Carrier Bankruptcy Forecasting and the Application of Various Models to the U.S. Airline Industry: 1980–2005." *Credit and Financial Management Review* XII(3): 11–30.

Gross, P., and Levitt, N. (1994). *Higher Superstition: The Academic Left and Its Quarrels with Science*. Baltimore: Johns Hopkins University Press.

Guston, B. (1995). *The Osprey Encyclopedia of Russian Aircraft 1875–1995*. London: Osprey Publishing.

Hacking, I. (1990). *The Taming of Chance*. Cambridge: Cambridge University Press.

Hallion, R. (2004). *Taking Flight: Inventing the Aerial Age, from Antiquity through the First World War*. Oxford: Oxford University Press.

Hamblin, J. (2007). "'A Dispassionate and Objective Effort': Negotiating the First Study on the Biological Effects of Atomic Radiation." *Journal of the History of Biology* 40(1): 147–177.

Hamblin, J. (2012) "Fukushima and the Motifs of Nuclear History." *Environmental History* 17: 285–299.

Hansen, M., McAndrews, C., and Berkeley, E. (2008). "History of Aviation Safety Oversight in the United States." *Final Report to Federal Aviation Administration*. Washington, DC: DOT/FAA/AR-08/39.

Harrington, A., and Downer, J. (2019). "Homo Atomicus: An Actor Worth Psychologizing? The Problems of Applying Behavioral Economics to Nuclear Strategy." In Knopf, J., and Harrington, A. (Eds.), *Behavioral Economics and Nuclear Weapons*, 187–202. Athens: University of Georgia Press.

Harriss, J. (2001). "The Concorde Redemption: Can the Superplane Make a Comeback?" *Air & Space Magazine*. <https://www.airspacemag.com/flight-today/the-concorde-redemption-2394800/?all> (accessed February 2, 2019).

Harvey, F. (2011). "Nuclear Is the Safest Form of Power, Says Top UK Scientist." *The Guardian*, March 30. <http://www.guardian.co.uk/environment/2011/mar/29/nuclear-power-safe-sir-david-king> (accessed June 19, 2013).

- Haynes, A. (1991). "The crash of United Flight 232." *Paper presented at NASA Ames Research Center, Dryden Flight Research Facility*, Edwards, California, 24 May.
- Hayward, B. and Lowe, A. (2004). "Safety Investigation: Systemic Occurrence Analysis Methods." In Goeters, K. M. (Ed.), *Aviation Psychology: Practice and Research*. United Kingdom: Ashgate: 363–380.
- Heimer, C. (1980). "Substitutes for Experience-based Information: The Case of Off-shore Oil Insurance in the North Sea." Discussion Paper no. 1181. Bergen, Norway: Institute of Industrial Economics.
- Henke, C. (2000). "Making a Place for Science: The Field Trial." *Social Studies of Science* 30(4): 483–511.
- Higgins, M. (2010). "Babies on Airlines: Safety Seats Are Safer than a Lap." *New York Times*, November 23.
- Hilgartner, S. (2000). *Science on Stage: Expert Advice as Public Drama*. Palo Alto, CA: Stanford University Press.
- Hilgartner, S. (2007). "Overflow and Containment in the Aftermath of Disaster." *Social Studies of Science* 37(1): 153–158.
- Hilkevitch, J. (2004). "Goose Got the Blame but It Was Rare Bird Plane Hit." *Chicago Tribune*, September 18.
- Hirano, S. (2013). "Nuclear Damage Compensation in Japan: Multiple Nuclear Melt-downs and a Myth of Absolute Safety." *総合政策研究*, 21: 1–35.
- Hiserodt, E. (2011). "Fukushima: Just How Dangerous Is Radiation?" *The New American*, April 27. <https://thenewamerican.com/print/fukushima-just-how-dangerous-is-radiation/> (accessed March 10, 2023).
- Hogge, L. (2012). *Effective Measurement of Reliability of Repairable USAF Systems*. PhD thesis. AFIT/GSE/12-S02DL. Wright-Patterson AFB, OH: Air Force Institute of Technology.
- Holanda, R. (2009). *A History of Aviation Safety Featuring the US Airline System*. Bloomington, IN: Authorhouse.
- Hollnagel, E. (2006). "Resilience—the Challenge of the Unstable." In Hollnagel, E., Woods, D. and Leveson, N. (Eds.), *Resilience Engineering: Concepts and Precepts*, 9–17. Aldershot, UK: Ashgate.
- Hollnagel, E., Woods, D., and Leveson, N. (Eds.). (2006). *Resilience Engineering: Concepts and Precepts*. Aldershot, UK: Ashgate.
- Honolulu Advertiser*. (2001). "Engineer Fears Repeat of 1988 Aloha Jet Accident." January 18. <http://the.honoluluadvertiser.com/2001/Jan/18/118localnews1.html> (accessed March 10, 2023).
- Hopkins, A. (1999). "The Limits of Normal Accident Theory." *Safety Science* 32(2): 93–102.
- Hopkins, A. (2009). *Failure to Learn: The BP Texas City Refinery Disaster*. North Ryde: CCH Australia.

- Hopkins, A. (2010). "Why BP Ignored Close Calls at Texas City." *Risk & Regulation. Special Issue on Close Calls, Near Misses and Early Warnings*, July, 4–5.
- Hopwood, A. G. and Miller, P. (Eds.). (1994). *Accounting as Social and Institutional Practice*. Cambridge: Cambridge University Press.
- Horgan, J. (2016). "Was Philosopher Paul Feyerabend Really Science's 'Worst Enemy'?" *Scientific American*, October 24. <https://blogs.scientificamerican.com/cross-check/was-philosopher-paul-feyerabend-really-science-s-worst-enemy/> (accessed August 8, 2017).
- Huber, M. (2004). "Beached Starship." *Smithsonian Air & Space Magazine*, September. <http://www.airspacemag.com/military-aviation/beached-starship-5429731/> (accessed September 7, 2016).
- Hughes, R. (1987). "A New Approach to Common Cause Failure." *Reliability Engineering* 17: 2111–2136.
- Hutter, B. M. (2001). *Regulation and Risk: Occupational Health and Safety on the Railways*. Oxford: Oxford University Press.
- Institution of Electrical Engineers (IEE). (2005). *Nuclear Reactor Types*. London. http://large.stanford.edu/courses/2013/ph241/kallman1/docs/nuclear_reactors.pdf (accessed August 21, 2016).
- Insurance Information Institute. (2018). "Aviation." https://www.iii.org/fact-statistic/facts-statistics-aviation-and-drones?table_sort_735941=9 (accessed September 21, 2018).
- International Air Transport Association (IATA). (2013). "Products and Services Release: The Airline Industry Story for 2012." Press Release, July 16. <http://www.iata.org/pressroom/pr/Pages/2013-07-16-01.aspx> (accessed December 20, 2017).
- International Civil Aviation Organization (ICAO). (1984). *Accident Prevention Manual*. January 1. Document no. 9422.
- Isidore, C. (2019). "Boeing Is about to Reveal Just How Much the 737 Max Crisis Hurt Its Business." *CNN Business*. <https://edition.cnn.com/2019/04/08/business/boeing-737-max-deliveries/index.html> (accessed April 8, 2019).
- Isidore, C. (2020a). "Boeing Says It Found Debris in Fuel Tanks of Parked 737 Max Jets" *CNN Business*, February 19. <https://edition.cnn.com/2020/02/19/business/boeing-737-max-fuel-tank-debris/index.html> (accessed July 7, 2020).
- Isidore, C. (2020b). "The Cost of the Boeing 737 Max Crisis: \$18.7 Billion and Counting." *CNN Business*, March 10. <https://edition.cnn.com/2020/03/10/business/boeing-737-max-cost/index.html> (accessed July 7, 2020).
- Jansen, B. (2014). "NTSB Chief Urges Child-Safety Seats on Planes." *USA Today*, April 21. <http://www.usatoday.com/story/news/nation/2014/04/21/ntsb-hersman-national-press-club-plane-crashes-rail-safety-buses-cars/7961795/> (accessed August 6, 2015).
- Jasanoff, S. (1986). *Risk Management and Political Culture*. New York: Russell Sage Foundation.
- Jasanoff, S. (1987). "Contested Boundaries in Policy-Relevant Science." *Social Studies of Science* 17: 195–230.

- Jasanoff, S. (1990). *The Fifth Branch: Science Advisors as Policymakers*. Cambridge, MA: Harvard University Press.
- Jasanoff, S. (Ed.) (1994). *Learning from Disaster: Risk Management after Bhopal*. Philadelphia: University of Pennsylvania Press.
- Jasanoff, S. (2003). "Technologies of Humility: Citizen Participation in Governing Science." *Minerva* 41(3): 223–244.
- Jasanoff, S. (2005). *Designs on Nature: Science and Democracy in Europe and the United States*. Princeton, NJ: Princeton University Press.
- Jasanoff, S., and Kim, S. H. (2015). *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*. Chicago: University of Chicago Press.
- Jasanoff, S., and Wynne, B. (1998). "Science and Decisionmaking." In Rayner, S., and Malone, E. (Eds.), *Human Choice and Climate Change, Volume 1: The Societal Framework*, 1–88. Pacific Northwest Labs, Columbus: Battelle Press.
- Jensen, L., and Yutko, B. (2014). "Why Budget Airlines Could Soon Charge You to Use the Bathroom." *FiveThirtyEight*, June 30. <http://fivethirtyeight.com/features/if-everyone-went-to-the-bathroom-before-boarding-the-plane-ticket-prices-might-be-lower/> (accessed September 9, 2016).
- Johnson, A. (2001). "Unpacking Reliability: The Success of Robert Bosch, GMBH in Constructing Antilock Braking Systems as Reliable Products." *History and Technology* (17): 249–270.
- Jones, R. (1999). *Mechanics of Composite Materials*. 2nd ed. New York: Brunner-Routledge.
- Jones-Imhotep, E. (2000). "Disciplining Technology: Electronic Reliability, Cold-War Military Culture and the Topside Ionogram." *History and Technology* 17: 125–175.
- Jones-Imhotep, E. (2002). "Reliable Humans, Trustworthy Machines: The Material and Social Construction of Electronic Reliability." Society for the History of Technology Conference Paper.
- Jones-Imhotep, E. (2017). *The Unreliable Nation: Hostile Nature and Technological Failure in the Cold War*. Cambridge, MA: MIT Press.
- Johnson, S. (2002). *The Secret of Apollo: Systems Management in American and European Space Programs*. Baltimore: Johns Hopkins University Press.
- Kahn, L.H. (2011). "Is the United States Prepared for a Nuclear Reactor Accident?" *Bulletin of the Atomic Scientists*, April 7.
- Kahneman, D. (2000). "Evaluation by Moments, Past and Future." In Kahneman, D., and Tversky, A. (Eds.), *Choices, Values and Frames*, 693–708. Cambridge: Cambridge University Press.
- Kahneman, D. (2011). *Thinking, Fast and Slow*. London: Penguin.
- Kaldor, M. (1981). *The Baroque Arsenal*. New York: Hill and Wang.
- Kan, N. (2017). *My Nuclear Nightmare: Leading Japan through the Fukushima Disaster to a Nuclear-Free Future*. Translated by Jeffrey S. Irish. Ithaca, NY: Cornell University Press.
- Kaplan, F. (2016). *Dark Territory: The Secret History of Cyber War*. London: Simon & Schuster.

- Kazel, R. (2015). "Ex-Chief of Nuclear Forces General Lee Butler Still Dismayed by Deterrence Theory and Missiles on Hair Trigger Alert." *Nuclear Age Peace Foundation*, May. <https://www.wagingpeace.org/general-lee-butler/> (accessed September 9, 2021).
- Kececioglu, D. and Tian, X. (1984). 'Reliability Education: A Historical Perspective.' *IEEE Transactions on Reliability* R-33(1): 390–398.
- Kemp, R., Schot, J., and Hoogma, R. (1998). "Regime Shifts to Sustainability through Processes of Niche Formation: The Approach of Strategic Niche Management." *Technological Analysis & Strategic Management* 10(2): 175–198.
- Khurana, K. C. (2009). *Aviation Management: Global Perspectives*. New Delhi: Global India Publications.
- King, M. (2016). *The End of Alchemy: Money, Banking, and the Future of the Global Economy*. London: Norton.
- Kirk, S. (1995). *First in Flight: The Wright Brothers in North Carolina*. Winston-Salem, NC: John F. Blair.
- Kitroeff, N. and Gelles, D. (2019). "At Boeing, C.E.O.'s Stumbles Deepen a Crisis." *The New-York Times*. December 22, 2019. <https://www.nytimes.com/2019/12/22/business/boeing-dennis-muilenburg-737-max.html> (accessed March 16, 2023).
- Klesius, M. (2009). "Are Aft-Facing Airplane Seats Safer?" *Airspacemag*. <https://www.airspacemag.com/need-to-know/are-aft-facing-airplane-seats-safer-146695292/?all> (accessed May 2, 2018).
- Knight J., and Leveson, N. (1986). "An Experimental Evaluation of the Assumption of Independence in Multiversion Programming." *IEEE Transactions on Software Engineering* 12(1): 96–109.
- Komite Nasional Keselamatan Transportasi Republic of Indonesia (KNKT). (2015). "PT. Indonesia Air Asia Airbus A320-216; PK-AXC Karimata Strait Coordinate 3°37' 19"S-109°42'41"E Republic of Indonesia 28 December 2014." Final Report. http://kemhubri.dephub.go.id/knkt/ntsc_home/ntsc.htm (accessed February 12, 2015).
- Komite Nasional Keselamatan Transportasi Republic of Indonesia (KNKT). (November 28, 2018). "Preliminary Aircraft Accident Investigation Report: PT. Lion Mentari Airlines Boeing 737-8 (MAX)." KNKT.18.10.35.04. http://knkt.dephub.go.id/knkt/ntsc_aviation/baru/pre/2018/2018%20-%20035%20-%20PK-LQP%20Preliminary%20Report.pdf (accessed April 5, 2019).
- Komons, N. (1978). *Bonfires to Beacons: Federal Civil Aviation Policy under the Air Commerce Act 1926–38*. Washington, DC: US Government Printing Office.
- Kreisher, O. (February 2010). "The Aircraft Losses Mount." *Air Force Magazine*. <http://www.airforcemag.com/MagazineArchive/Pages/2010/February%202010/0210aircraft.aspx> (accessed March 12, 2019).
- Kubiak, W. D. (2011). "Fukushima's Cesium Spew—Deadly Catch-22s in Japan Disaster Relief." *Truthout*, June 27. <http://www.truth-out.org/fukushimas-cesium-spew-eludes-prussian-blues-deadly-catch-22s-japan-disaster-relief/1308930096> (accessed June 19, 2013).

- Kuhn, T. (1996 [1962]). *The Structure of Scientific Revolutions*, 3rd ed. Chicago: University of Chicago Press.
- Kusch, M. (2012). "Sociology of Science: Bloor, Collins, Latour." In Brown, J. (Ed.), *Philosophy of Science: The Key Thinkers*. London: Continuum Books: 165–182.
- Lagoni, N. I. (2007). *The Liability of Classification Societies*. Berlin: Springer.
- Lampland, M. (2010). "False Numbers as Formalizing Practices." *Social Studies of Science* 40(3): 377–404.
- Langewiesche, W. (1998a). *Inside the Sky: A Meditation on Flight*. New York: Pantheon.
- Langewiesche, W. (1998b). "The Lessons of ValuJet 592." *Atlantic Monthly*, March. <http://www.theatlantic.com/magazine/archive/1998/03/the-lessons-of-valujet-592/306534/> (accessed September 4, 2017).
- Langewiesche, W. (2003). "Columbia's Last Flight." *The Atlantic*, November. <https://www.theatlantic.com/magazine/archive/2003/11/columbias-last-flight/304204/> (accessed September 4, 2017).
- Langewiesche, W. (2009a). "Anatomy of a Miracle." *Vanity Fair*; June.
- Langewiesche, W. (2009b). *Fly by Wire: The Geese, the Glide, the Miracle on the Hudson*. New York: Farrar, Straus & Giroux.
- Langewiesche, W. (2014). "The Human Factor." *Vanity Fair*, October. <http://mg.co.za/article/2010-02-22-the-human-factor> (accessed December 1, 2015).
- LaPorte, T. (1982). "On the Design and Management of Nearly Error-Free Organizational Control Systems." In Sills, D., Shelanski, V., and Wolf, C. (Eds.), *Accident at Three Mile Island: The Human Dimensions*, 185–200. Boulder, CO: Westview.
- LaPorte, T. (1994). "A Strawman Speaks Up: Comments on the Limits of Safety." *Journal of Contingencies and Crisis Management* 2(2): 207–212.
- LaPorte, T., and Consolini, P. M. (1991). "Working in Practice but Not in Theory: Theoretical Challenges of 'High Reliability Organizations'." *Journal of Public Administration Research and Theory* 1(1): 19–47.
- LaPorte, T., and Rochlin, G. (1994). "A Rejoinder to Perrow." *Journal of Contingencies and Crisis Management* 2(4): 221–227.
- Latour, B. (1987). *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard University Press.
- Latour, B. (1996). *Aramis, or the Love of Technology*. Cambridge, MA: Harvard University Press.
- Latour, B. (1999). *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge, MA: Harvard University Press.
- Latour, B. (2004). "Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern." *Critical Inquiry* 30(2): 225–248.
- Latour, B., and Woolgar, S. (1979). *Laboratory Life: The Social Construction of Scientific Facts*. Beverly Hills, CA: SAGE.

- Lauber, J. K. (1989). "Human Performance and Aviation Safety: Some Issues and Some Solutions." *Accident Prevention Bulletin* 46(4): 10–11.
- Lazonick, W., and O'Sullivan, M. (2000). "Maximising Shareholder Value: A New Ideology for Corporate Governance." *Economy and Society* 29(1): 13–35.
- Lean, G. (2012). "Why Nuclear Is in Meltdown." *The Telegraph*, March 2. <http://www.telegraph.co.uk/comment/9118831/Why-nuclear-is-in-meltdown.html> (accessed August 9, 2013).
- Le Coze, J. C. (2015). "1984–2014. 'Normal Accidents': Was Charles Perrow Right for the Wrong Reasons?" *Journal of Contingencies and Crisis Management* 23(4): 275–286.
- Le Coze, J. C. (Ed.) (2020). *New Perspectives on Safety Research*. Boca Raton, FL: CDC Press.
- Lederer, J. (1968). "Risk speculations of the Apollo Project." *Paper presented at the Wings Club*. New York, December 18, 1968.
- Lee, J., Veloso, F. M., Hounshell, D. A., and Rubin, E. S. (2010). "Forcing Technological Change: A Case of Automobile Emissions Control Technology Development in the US." *Technovation* 30: 249–264.
- Lenorovitz, J. (1991). "Airbus Survey Confirms Requirement for Very Large Transport Aircraft." *Aviation Week and Space Technology*, October 28.
- Leveson, N. (1988). "Airbus Fly-by-Wire Controversy." *The Risks Digest* 6(32). Friday, February 26, 1988. <http://catless.ncl.ac.uk/Risks/6.32.html> (accessed July 20, 2015).
- Leveson, N., Dulac, N., Marais, K., and Carroll, J. (2009). "Moving beyond Normal Accidents and High-Reliability Organizations: A Systems Approach to Safety in Complex Systems." *Organization Studies* 30(2–3): 227–249.
- Lewis, H. (1990). *Technological Risk*. New York: Norton.
- Li, V. (2018). "The Next Financial Crisis: Why It Is Looking Like History May Repeat Itself." CNBC, September 14. <https://www.cnbc.com/2018/09/14/the-next-financial-crisis-why-it-looks-like-history-may-repeat-itself.html> (accessed July 14, 2021).
- Littlewood, B. (1996). "The Impact of Diversity upon Common Cause Failure." *Reliability Engineering & System Safety* 51(1): 101–113.
- Littlewood, B., and Miller, D. (1989). "Conceptual Modeling of Coincident Failures in Multi-Version Software." *IEEE Transactions on Software Engineering* 15(12): 1596–1614.
- Littlewood, B., Popov, P., and Strigini, L. (1999). "A Note on the Reliability Estimation of Functionally Diverse Systems." *Reliability Engineering & System Safety* 66: 93–95.
- Littlewood, B., Popov, P., and Strigini, L. (2002). "Assessing the Reliability of Diverse Fault-Tolerant Systems." *Safety Science* 40: 781–796.
- Littlewood, B., and Strigini, L. (1993). "Validation of Ultra-High Dependability for Software-based Systems." *Communications of the ACM* 36(11): 69–80.
- Littlewood, B., and Wright, D. (1997). "Some Conservative Stopping Rules for the Operational Testing of Safety-Critical Software." *IEEE Transactions on Software Engineering* 23(11): 673–683.

- Lloyd, E., and Tye, W. (1982). *Systematic Safety: Safety Assessment of Aircraft Systems*. London: Civil Aviation Authority (CAA).
- Lochbaum, D., Lyman, E., and Stranahan, S. (2014). *Fukushima: The Story of a Nuclear Disaster*. New York: New Press.
- Loftin, L. (1985). *Quest for Performance: The Evolution of Modern Aircraft*. Washington, DC: NASA Scientific and Technical Information Branch.
- Longmate, N. (1985). *Hitler's Rockets: The Story of the V-2s*. London: Hutchinson.
- Losey, S. (2018). "Fewer Planes Are Ready to Fly: Air Force Mission-Capable Rates Decline amid Pilot Crisis." *Air Force Times*, March 5. <https://www.airforcetimes.com/news/your-air-force/2018/03/05/fewer-planes-are-ready-to-fly-air-force-mission-capable-rates-decline-amid-pilot-crisis/> (accessed March 3, 2019).
- Lowenstein, R. (2011). *The End of Wall Street*. London: Penguin.
- Lowy, J. (2010). "Cascading Failures Followed Airline Engine Blowout." *San-Diego Union Tribune*, November 10. <http://www.sandiegouniontribune.com/sdut-cascading-failures-followed-airline-engine-blowout-2010nov18-story.html> (accessed September 24, 2017).
- Lowy, J. (2018). "Fact Check: Trump Wrongly Claims Credit for Lack of Commercial Airline Crash Deaths." *Chicago Tribune*, January 2. <http://www.chicagotribune.com/news/nationworld/politics/factcheck/ct-trump-airline-safety-fact-check-20180102-story.html> (accessed September 21, 2018).
- Luhmann, N. (2005). *Risk: A Sociological Theory*. New Brunswick, NJ: Aldine.
- Lundberg, B. K. O. (1965). "The Supersonic Adventure." *Bulletin of the Atomic Scientists*, February: 29–33.
- Lynch, M. (2017). "STS, Symmetry and Post-Truth." *Social Studies of Science* 47(4): 593–599.
- Lynch, M., and Cole, S. (2002). "Judicial Metascience and the Credibility of Expert Evidence." European Association for the Study of Science & Technology (EASST) Conference, University of York, UK (July 31—August 3, 2002).
- Macarthur, J., and Tesch, M. (1999). *Air Disaster, Volume 3*. Fyshwick, Australia: Aerospace Publications.
- Macheras, A. (2019). "The Boeing Crisis: One Month Later." *Aviation Analyst*, April 10. <https://aviationanalyst.co.uk/2019/04/10/the-boeing-crisis-one-month-later/> (accessed April 8, 2019).
- MacKenzie, D. (1989). "From Kwajalein to Armageddon? Testing and the Social Construction of Missile Accuracy." In Gooding, D., Pinch, T. and Schaffer, S. (Eds.), *The Uses of Experiment: Studies in the Natural Sciences*, 409–435. Cambridge: Cambridge University Press.
- MacKenzie, D. (1990). *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance*. Cambridge, MA: MIT Press.
- MacKenzie, D. (1996a). "How Do We Know the Properties of Artifacts? Applying the Sociology of Knowledge to Technology." In Fox, R. (Ed.), *Technological Change*:

- Methods and Themes in the History of Technology*, 249–251. Amsterdam: Harwood Academic.
- MacKenzie, D. (1996b). *Knowing Machines: Essays on Technical Change*. Cambridge, MA: MIT Press.
- MacKenzie, D. (2001). *Mechanizing Proof: Computing, Risk, and Trust*. Cambridge, MA: MIT Press.
- MacKenzie, D. (2005). *An Engine, not a Camera. How Financial Models Shape Markets*. Cambridge, MA: MIT Press.
- MacKenzie, D., and Spinardi G. (1996). "Tacit Knowledge and the Uninvention of Nuclear Weapons." *American Journal of Sociology* 101(1): 44–99.
- MacKinnon, B., Sowden, R., and Dudley, S. (Eds.). (2001). *Sharing the Skies: An Aviation Guide to the Management of Wildlife Hazards*. Ottawa: Transport Canada.
- Macrae, C. (2007). "Interrogating the Unknown: Risk Analysis and Sensemaking in Airline Safety Oversight." Discussion Paper No: 43. ESRC Centre for Analysis of Risk and Regulation (LSE).
- Macrae, C. (2014). *Close Calls: Managing Risk and Resilience in Airline Flight Safety*. London: Palgrave Macmillan.
- Maksel, R. (2008). "What Determines an Airplane's Lifespan?" *Air & Space Magazine*, March 1.
- March, J., and Olsen, J. (1988). "The Uncertainty of the Past: Organizational Learning under Ambiguity." In March, J., *Decisions and Organizations*. New York: Wiley.
- March, J., and Simon, H. (1958). *Organizations*. New York: Wiley.
- March, J., Sproull, L., and Tamuz, M. (1991). "Learning from Samples of One or Fewer." *Organization Science* 2(1): 1–13.
- Marks, P. (2006). "Warning Signs." *New Scientist* 191(2560). July 12.
- Marks, P. (2009). "Why Large Carbon-Fibre Planes Are Still Grounded." *New Scientist*, August 22, 20.
- Marra, P. P., Dove, C. J., Dolbeer, R., et al. (2009). "Migratory Canada Geese Cause Crash of US Airways Flight 1549." *Frontiers in Ecology and the Environment* 7(6): 297–301.
- Marsh, G. (2009). "Boeing's 787: Trials, Tribulations, and Restoring the Dream." *Reinforced Plastics* November/December: 16–21.
- Matsumura, A. (2012). "Fukushima Daiichi Site: Cesium-137 Is 85 Times Greater than at Chernobyl Accident." *Finding the Missing Link*, April 3. <https://www.nrc.gov/docs/ML1210/ML12103A214.pdf> (accessed March 10, 2023).
- McCurdy, H. (1993). *Inside NASA: High Technology and Organizational Change in the U.S. Space Program*. Baltimore: John Hopkins University Press.
- McNeill, D., and Adelstein, J. (2011). "Meltdown: What Really Happened at Fukushima?" *Atlantic Wire*, July 2. <http://www.theatlanticwire.com/global/2011/07/meltdown-what-really-happened-fukushima/39541/> (accessed June 19, 2013).

- Mecham, M. (2003). "Betting on Suppliers." *Aviation Week and Space Technology*. October 23, 2003.
- Mecham, M. (2005). "More Flight Time: Composites and Electric Systems Should Help Keep Boeing's 787 Out of Maintenance Shops." *Aviation Week and Space Technology*, April 18.
- Mecham, M. (2009). "Starts and Fits." *Aviation Week and Space Technology*, June 29, 2009.
- Merlin, P. (2009). "Design and Development of the Blackbird: Challenges and Lessons Learned." Paper delivered at 47th AIAA Aerospace Sciences Meeting, Including the New Horizons Forum and Aerospace Exposition January 5–8, 2009, Orlando, FL.
- Merton, R. K. (1936). "The Unanticipated Consequences of Purposive Social Action." *American Sociological Review* 1(6): 894–904.
- Merton, R. K. (1940). "Bureaucratic Structure and Personality." *Social Forces* 18: 560–568.
- Mihm, S. (2019). "The FAA Has Always Played Cozy with the Aviation Industry." *Bloomberg Opinion*, March 21. <https://www.bloomberg.com/opinion/articles/2019-03-21/boeing-737-crash-faa-confronts-its-confusing-role-as-regulator> (accessed March 27, 2019).
- Miller, C. R. (2003a). "The Presumptions of Expertise: The Role of Ethos in Risk Analysis." *Configurations* 11(2), 163–202.
- Miller, P. (2003b). "Governing by Numbers: Why Calculative Practices Matter." In *The Blackwell Cultural Economy Reader*, 179–189. London: Blackwell.
- Miller, R., and Sawers, D. (1970). *The Technical Development of Modern Aviation*. New York: Praeger.
- Miller, P., and Napier, C. (1993). "Genealogies of Calculation." *Accounting, Organizations and Society* 18(7–8): 631–647.
- Minoura, K., Imamura, F., Sugawara, D., Kono, Y. and Iwashita, T. (2001). "The 869 Jogan Tsunami Deposit and Recurrence Interval of Large-Scale Tsunami on the Pacific Coast of Northeast Japan." *Journal of Natural Disaster Science* 23: 83–88.
- Mitcham, C. (1994). *Thinking through Technology: The Path between Engineering and Philosophy*. Chicago: University of Chicago Press.
- Mohney, G. (2014). "Long Search for Missing Plane Could Cost 'Hundreds of Millions of Dollars.'" ABC News Online, March 13. <http://abcnews.go.com/International/long-search-missing-plane-cost-hundreds-millions-dollars/story?id=22899690> (accessed December 16, 2015).
- Mokyr, J. (1990). *The Lever of Riches: Technological Creativity and Economic Progress*. Oxford: Oxford University Press.
- Moon, H. (1989). *Soviet SST: The Technopolitics of the Tupolev-144*. London: Orion Books.
- Morris, H. (2017). "58,000 Miles and 46 Flights: A Week in the Extraordinary Life of a Modern Aircraft." *The Telegraph*, October 13.

- Mowery, D. C., and Rosenberg, N. (1981). "Technical Change in the Commercial Aircraft Industry, 1925–1975." *Technological Forecasting and Social Change* 20: 347–358.
- Munro, E. (2004). "The Impact of Audit on Social Work Practice." *British Journal of Social Work* 34(8): 1075–1095.
- Murawski, S. A., Hollander, D. J., Gilbert, S. and Gracia, A. (2020). "Deepwater Oil and Gas Production in the Gulf of Mexico and Related Global Trends." In Murawski, S., Ainsworth, C. H., Gilbert, S., et al. (Eds.), *Scenarios and Responses to Future Deep Oil Spills*, 16–33. Cham, Switzerland: Springer.
- Musso, C. (2009). "New Learning from Old Plastics: The Effects of Value-Chain-Complexity on Adoption Time." *Technovation* 29(4): 299–312.
- Myre, G. (2017) "Stanislav Petrov, 'The Man Who Saved the World,' Dies at 77." NPR, September 18. <https://www.npr.org/sections/thetwo-way/2017/09/18/551792129/stanislav-petrov-the-man-who-saved-the-world-dies-at-77?t=1628523159902> (accessed September 9, 2021).
- Nader, R., and Smith, W. (1994). *Collision Course: The Truth about Airline Safety*. New York: TAB Books.
- National Academy of Sciences (NAS) (National Research Council). (1980). *Improving Aircraft Safety: FAA Certification of Commercial Passenger Aircraft*. Washington, DC: National Academies Press.
- National Academy of Sciences (NAS) (National Research Council). (1998). *Improving the Continued Airworthiness of Civil Aircraft: A Strategy for the FAA's Aircraft Certification Service*. Washington, DC: National Academies Press.
- National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (NCBP). (January 2011). *Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling*. Report to the President.
- National Transportation Safety Board (NTSB). (1972). "Aircraft Accident Report: Capitol International Airways, Inc., DC-8-63F, N4909C, Anchorage, Alaska, November 27, 1970." NTSB-ARR-72-12. No. i-0025.
- National Transportation Safety Board (NTSB). (1973). "NTSB-AAR-73-02 Report, Aircraft Accident Report: American Airlines, Inc. McDonnell Douglas DC-10-10, N103AA. Near Windsor, Ontario, Canada. June 12, 1972." February 28, 1973. Washington, DC.
- National Transportation Safety Board (NTSB). (1989). "Aircraft Accident Report—Aloha Airlines, Flight 243, Boeing 737-200, N73711, near Maui, Hawaii, April 28, 1988." Report no: NTSB/AAR-89/03; Acc. No: PB89–91C404. Washington, DC.
- National Transportation Safety Board (NTSB). (1996). "In-Flight Fire and Impact with Terrain ValuJet Airlines Flight 592, DC-9-32, N904VJ. Everglades, near Miami, Florida. May 11, 1996." Report no: NTSB/AAR-97/06; Acc. No: PB97–910406. Washington, DC.
- National Transportation Safety Board (NTSB). (2000a). "In-flight Breakup over the Atlantic Ocean, Trans World Airlines Flight 800, Boeing 747-131, N93119, Near East Moriches, New York, July 17, 1996." Aircraft Accident Report NTSB/AAR-00/03. Washington, DC.

- National Transportation Safety Board (NTSB). (2000b). Loss of Control and Impact with Pacific Ocean, Alaska Airlines Flight 261, McDonnell Douglas MD-83, N963AS, about 2.7 Miles North of Anacapa Island, California, January 31, 2000. Aircraft Accident Report NTSB/AAR-02/01. Washington, DC.
- National Transportation Safety Board (NTSB). (2006a). "Safety Recommendation A-06-27—A-06-28." Washington, DC.
- National Transportation Safety Board (NTSB). (2006b). "Safety Report on the Treatment of Safety-Critical Systems in Transport Airplanes." Safety Report NTSB/SR-06/02. PB2006-917003. Notation 7752A. Washington, DC.
- National Transportation Safety Board (NTSB). (2009). Loss of Thrust in Both Engines after Encountering a Flock of Birds and Subsequent Ditching on the Hudson River, 213. Accident Report. NTSB/AAR-10/03. Washington, DC.
- National Transportation Safety Board (NTSB). (2013). "Auxiliary Power Unit Battery Fire Japan Airlines Boeing 787—8, JA829J." No. NTSB/AIR-14/01. Boston.
- Neufeld, M. (1990). "The Guided Missile and the Third Reich: Peenemünde and the Forging of a Technological Revolution." In Renneberg, M. and Walker, M. (Eds.), *Science, Technology, and National Socialism*, 51–71. Cambridge: Cambridge University Press.
- Newhouse, J. (1982). *The Sporty Game: The High-Risk Competitive Business of Making and Selling Commercial Airlines*. New York: Knopf.
- Neyland, D., and Woolgar, S. (2002). "Accountability in Action? The Case of a Database Purchasing Decision." *British Journal of Sociology* 53: 259–274.
- Nicas, J., and Creswell, J. (2019). "Boeing's 737 Max: 1960s Design, 1990s Computing Power and Paper Manuals." *New York Times*, April 8. <https://www.nytimes.com/2019/04/08/business/boeing-737-max-.html> (accessed April 8, 2019).
- Nicas, J., Kitroeff, N., Gelles, D. and Glanz, J. (2019). "Boeing Built Deadly Assumptions Into 737 Max, Blind to a Late Design Change" *New York Times*, June 1.
- Niles, M. (2002). "On the Hijacking of Agencies (and Airplanes): The Federal Aviation Administration. 'Agency Capture' and Airline Security." *Journal of Gender, Social Policy & the Law* 10(2): 381–442.
- Nöggerath, J., Geller, R., and Gusiakov, V. (2011). "Fukushima: The Myth of Safety, the Reality of Geoscience." *Bulletin of the Atomic Scientists* 67(5): 37–46.
- Norris, G. (2009). "Flying Start." *Aviation Week and Space Technology*, December 21, 2009.
- Norris, G., and Hills, B. (1994). "Transcript Reveals Cockpit Anarchy." *Flight International* October, 5–11.
- Norris, G., and Wagner, M. (1999). *Airbus*. St. Paul, MN: MBI Publishing.
- Nuclear Energy Institute (NEI). (2016). "World Statistics." <http://www.nei.org/Knowledge-Center/Nuclear-Statistics/World-Statistics> (accessed August 1, 2016).
- Oberstar, J. L. and Mica, J. L. (2008). "Critical Lapses in FAA Safety Oversight of Airlines: Abuses of Regulatory Partnership Programs." Summary of Subject Matter, US House of Representatives Committee on Transportation and Infrastructure. Washington, DC: US Government Printing Office.

- Office of Technology Assessment (OTA). (July 1988). "Safe Skies for Tomorrow: Aviation Safety in a Competitive Environment." OTA-SET-381. Washington, DC: US Government Printing Office.
- O'Hehir, A. (2016). "The Night We Almost Lost Arkansas—A 1980 Nuclear Armageddon That Almost Was." *Salon*, September 14. <https://www.salon.com/2016/09/14/the-night-we-almost-lost-arkansas-a-1980-nuclear-armageddon-that-almost-was/> (accessed September 9, 2021).
- Okrent, D. (1978). *On the History of the Evolution of Light Water Reactor Safety in the United States*. International Panel on Fissile Materials. http://fissilematerials.org/library/1978/06/on_the_history_of_the_evolutio.html (accessed 07/05/2012).
- Onishi, N. (2011). "'Safety Myth' Left Japan Ripe for Nuclear Crisis." *New York Times*, June 24.
- Onishi, N., and Fackler, M. (2011). "Japan Held Nuclear Data, Leaving Evacuees in Peril." *New York Times*, August 8.
- Oreskes, N., and Conway, E. (2010). *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*. London: Bloomsbury.
- Orlady, H. (2017). *Human Factors in Multi-Crew Flight Operations*. London: Routledge.
- Orlebar, C. (1997). *The Concorde Story*. Oxford: Osprey.
- O'Rourke, R. (2009). "Air Force F-22 Fighter Program: Background and Issues for Congress." *CRS Report for Congress* RL31673. July 16. Washington, DC: Congressional Research Service.
- Osno E. (2011). "The Fallout. Seven Months Later: Japan's Nuclear Predicament." *The New Yorker*, October 17, 26–61.
- Ostrower, J. (2011). "Boeing Aims to Minimise 737 Max Changes." *Air Transport Intelligence News*, August 31. <https://www.flightglobal.com/news/articles/boeing-aims-to-minimise-737-max-changes-361440/> (accessed April 5, 2019).
- Owen, K. (2001). *Concorde: Story of a Supersonic Pioneer*. London: Science Museum.
- Partnoy, F. (2020). "The Looming Bank Collapse." *The Atlantic*, July/August. <https://www.theatlantic.com/magazine/archive/2020/07/coronavirus-banks-collapse/612247/> (accessed September 14, 2021).
- Peltzman, S. (1976). "Toward a More General Theory of Regulation." *Journal of Law and Economics* 19(2): 211–240.
- Perin, C. (2005). *Shouldering Risks: The Culture of Control in the Nuclear Power Industry*. Princeton, NJ: Princeton University Press.
- Perrow, C. (1983). "The Organizational Context of Human Factors Engineering." *Administrative Science Quarterly* 28(4): 521–541.
- Perrow, C. (1984). *Normal Accidents: Living with High-Risk Technologies*. New York: Basic Books.
- Perrow, C. (1994). "The Limits of Safety: The Enhancement of a Theory of Accidents." *Journal of Contingencies and Crisis Management* 4(2): 212–220.

- Perrow, C. (1999). *Normal Accidents: Living with High-Risk Technologies* 2nd ed. Princeton, NJ: Princeton University Press.
- Perrow, C. (2007). *The Next Catastrophe: Reducing Our Vulnerabilities to Natural, Industrial, and Terrorist Disasters*. Princeton, NJ: Princeton University Press.
- Perrow, C. (2011). "Fukushima and the Inevitability of Accidents." *Bulletin of the Atomic Scientists* 67(6): 44–52.
- Perrow, C. (2015). "Cracks in the 'Regulatory State.'" *Social Currents* 2(3): 203–212.
- Petroski, H. (1992a). *To Engineer Is Human: The Role of Failure in Successful Design*. New York: Vintage Books.
- Petroski, H. (1992b). *The Evolution of Useful Things: How Everyday Artifacts from Forks and Pins to Paperclips and Zippers Came to Be as They Are*. New York: Alfred A. Knopf.
- Petroski, H. (1994). *Design Paradigms: Case Histories of Error and Judgment in Engineering*. Cambridge: Cambridge University Press.
- Petroski, H. (2008). *Success through Failure: The Paradox of Design*. Princeton, NJ: Princeton University Press.
- Philips, A. (1998). "20 Mishaps That Might Have Started Accidental Nuclear War." Nuclearfiles.org. <https://web.archive.org/web/20200703203219/http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/accidents/20-mishaps-maybe-caused-nuclear-war.htm> (accessed September 9, 2021).
- Pilkington, E. (2013). "US Nearly Detonated Atomic Bomb over North Carolina—Secret Document." *The Guardian*, September 20. <https://www.theguardian.com/world/2013/sep/20/usaf-atomic-bomb-north-carolina-1961> (accessed September 9, 2021).
- Pinch, T. (1991). "How Do We Treat Technical Uncertainty in Systems Failure? The Case of the Space Shuttle Challenger." In LaPorte, T. (Ed.), *Social Responses to Large Technical Systems: Control or Anticipation*, 143–158. Dordrecht, Netherlands: Kluwer Academic Publishers.
- Pinch, T. (1993). "'Testing—One, Two, Three . . . Testing!': Toward a Sociology of Testing." *Science, Technology, & Human Values* 18(1): 25–41.
- Pinch, T., and Bijker, W. (1984). "The Social Construction of Facts and Artifacts: or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other." *Social Studies of Science* 14: 339–441.
- Polanyi, M. (1958). *Personal Knowledge*. London: Routledge & Kegan Paul.
- Pollock, N., and Williams, R. (2010). "The Business of Expectations: How Promissory Organizations Shape Technology and Innovation." *Social Studies of Science* 40(4): 525–548.
- Pope, S. (2008). "Fly by Wire Technology." *AINonline*, February 8. <https://www.ainonline.com/aviation-news/aviation-international-news/2008-02-08/fly-wire-technology> (accessed September 6, 2015).
- Popov, P., Strigini, L., May, J. and Kuball, S. (2003). "Estimating Bounds on the Reliability of Diverse Systems." *IEEE Transactions on Software Engineering* 29(4): 345–359.

- Popper, K. (1959). *The Logic of Scientific Discovery*. New York: Basic Books.
- Porter, T. M. (1994). "Making Things Quantitative." In Power, M. (Ed.), *Accounting and Science: Natural Inquiry and Commercial Reason*, 36–57. Cambridge: Cambridge University Press.
- Porter, T. M. (1995). *Trust in Numbers: The Pursuit of Objectivity in Scientific and Public Life*. Princeton, NJ: Princeton University Press.
- Posner, R. A. (1971). "Taxation by Regulation." *Bell Journal of Economics and Management Science* 2(22): 22–50.
- Posner, R. A. (1974). "Theories of Economic Regulation." *Bell Journal of Economics and Management Science* 5(2): 335–358.
- Posner, R. A. (1975). "The Social Costs of Monopoly and Regulation." *Journal of Political Economy* 83(4): 807–827.
- Power, M. (1997). *The Audit Society: Rituals of Verification*. Oxford: Oxford University Press.
- Power, M. (2003). "The Operational Risk Game." *Risk & Regulation* (5). London: LSE Center for Analysis of Risk and Regulation.
- Power, M. (2007). *Organized Uncertainty: Designing a World of Risk Management*. Oxford: Oxford University Press.
- Proctor, R. (1991). *Value-Free Science?: Purity and Power in Modern Knowledge*. Cambridge, MA: Harvard University Press.
- Quine, W. V. O. (1975). "On Empirically Equivalent Systems of the World." *Erkenntnis* 9(3): 313–328.
- Quintana, M. (2012). "Fukushima Crisis Concealed: Japanese Government Kept Worst-Case Scenario under Wraps." *Asia Pacific Journal*, January 31, 2012. <http://japanfocus.org///events/view/129> (accessed September 8, 2013).
- Rae, J. B. (1968). *Climb to Greatness: The American Aircraft Industry, 1920–1960*. Cambridge, MA: MIT Press.
- Raju, S. (2016). "Estimating the Frequency of Nuclear Accidents." *Science & Global Security* 24(1): 37–62.
- Raman, R., Graser, J., and Younossi, O. (2003). *The Effects of Advanced Materials on Airframe Operating and Support Costs*. RAND Documented Briefing. Santa Monica, CA: RAND.
- Ramana, M. V. (2011). "Beyond Our Imagination: Fukushima and the Problem of Assessing Risk." *Bulletin of the Atomic Scientists*, April 19. <https://thebulletin.org/2011/04/beyond-our-imagination-fukushima-and-the-problem-of-assessing-risk/> (accessed March 7, 2023).
- Rasmussen, J. (1983). Human Error. *Position Paper for NATO Conference on Human Error*. August 1983, Bellagio, Italy.
- Rasmussen, J. (1990). "Human Error and the Problem of Causality in the Analysis of Accidents." *Philosophical Transactions of the Royal Society of London* B327: 449–462.

- Rasmussen, J. (1997). "Risk Management in a Dynamic Society: A Modeling Problem." *Safety Science* 27(2): 183–213.
- Reason, J. (1990). *Human Error*. Cambridge: Cambridge University Press.
- Reason, J. (1997). *Managing the Risks of Organisational Accidents*. London: Ashgate.
- Reason, J. (2016). *Organizational accidents revisited*. Aldershot, UK: Ashgate.
- Regulinski, T. (1984). "One Score and Fifteen Years Ago." *IEEE Transactions on Reliability* R-33(1): 65–67.
- Rhodes, J. (July 1990). "The Black Jet." *Air Force Magazine*, Air Force Association, 73(7). <https://www.airandspaceforces.com/article/0790blackjet/> (accessed March 10, 2023).
- Rijpma, J. (1997). "Complexity, Tight-Coupling and Reliability: Connecting Normal Accidents Theory and High Reliability Theory." *Journal of Contingencies and Crisis Management* 5(1): 15–23.
- Rip, A. (1985). "Experts in Public Arenas." In Otway, H. and Peltu, M. (Eds.), *Regulating Industrial Risks: Science Hazards and Public Protection*, 94–110. London: Butterworths.
- Rip, A. (1986). "The Mutual Dependence of Risk Research and Political Context." *Science & Technology Studies* 4(3/4): 3–15.
- Risk Assessment Review Group (RARG). (September 1978). *Risk Assessment Review Group Report to the U.S. Nuclear Regulatory Commission*. NUREG/CR-0400.
- Roberts, K. H. (1989). "New Challenges in Organization Research: High Reliability Organizations." *Industrial Crisis Quarterly* 3(2): 111–125.
- Roberts, K. H. (1993). "Introduction." In Roberts, K. H. (Ed.), *New Challenges to Understanding Organizations*, 1–10. New York: Macmillan.
- Robison, P., and Newkirk, M. (2019). "Relationship between Boeing, FAA Safety Regulators under Scrutiny." *Insurance Journal*, March 25. <https://www.insurancejournal.com/news/national/2019/03/25/521514.htm> (accessed March 27, 2019).
- Rochlin, G. I., LaPorte, T. R., and Roberts, K. H. (1987). "The Self-Designing High-Reliability Organization: Aircraft Carrier Flight Operations at Sea." *Naval War College Review* 40(4): 76–90.
- Rogers, J. (1996). *Advanced Composite Materials: The Air Force's Role in Technology Development*. RAND Corporation, Document Number: N-3503-AF.
- Rothstein, H., and Downer, J. (2012). "Renewing Defra: Exploring the Emergence of Risk-Based Policymaking in UK Central Government." *Public Administration*. 90(3): 781–799.
- Rothstein, H., Huber, M., and Gaskell, G. (2006). "A Theory of Risk Colonization: The Spiraling Regulatory Logics of Societal and Institutional Risk." *Economy and Society* 35(1): 91–112.
- Rozell, N. (1996). "The Boeing 777 Does More with Less." *Alaska Science Forum*, May 23. <https://www.gi.alaska.edu/alaska-science-forum/boeing-777-does-more-less> (accessed March 10, 2023).

- Rushby, J. (December 1993). *Formal Methods and the Certification of Critical Systems*. Technical Report CSL-93-7.
- Saba, J. (1983). "Aircraft Crashworthiness in the United States: Some Legal and Technical Parameters." *Journal of Air Law and Commerce* 48(2): 287–346.
- SAE International. (1996). "ARP4761: Guidelines and Methods for Conducting the Safety Assessment Process on Civil Airborne Systems and Equipment." January 12. Warrendale, PA.
- Sagan, S. (1993). *The Limits of Safety*. Princeton, NJ: Princeton University Press.
- Sagan, S. (2004). "The Problem of Redundancy Problem: Why More Nuclear Security Forces May Produce Less Nuclear Security." *Risk Analysis* 24(4): 935–946.
- Salter, L. (1988). *Mandated Science: Science and Scientists in the Making of Standards*. Dordrecht, Netherlands: Springer.
- Saxon, W. (1994) "Paul K. Feyerabend, 70, Anti-Science Philosopher." *New York Times*. March 8.
- Schlosser, E. (2013). *Command and Control: Nuclear Weapons, the Damascus Accident, and the Illusion of Safety*. New York: Allen Lane.
- Schmidt, J. (2009). "The Definition of Structural Engineering." *Structure Magazine*, January: 9.
- Schulman, P. (1993). "The Negotiated Order of Organizational Reliability." *Administration & Society* 25(3): 353–372.
- Scott, J. (1998). *Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven, CT: Yale University Press.
- Schiavo, M. (1997). *Flying Blind, Flying Safe*. New York: Avon Books.
- Shalal-Esa, A. (2014). "Exclusive: Pentagon Report Faults F-35 on Software, Reliability." *Reuters*, January 24. <https://www.reuters.com/article/us-lockheed-fighter-exclusive/exclusive-pentagon-report-faults-f-35-on-software-reliability-idUSBREA0N0ID20140124> (accessed March 14, 2019).
- Shanahan, D. (2004). "Basic Principles of Crashworthiness." NATO RTO-EN-HFM-113. <https://www.semanticscholar.org/paper/Basic-Principles-of-Crashworthiness-Shanahan/225b4ff4b954467a26708eb596c3cdbcd304b5db> (accessed March 10, 2023).
- Shapin, S. (1995). "Cordelia's Love: Credibility and the Social Studies of Science." *Perspectives on Science* 3: 266–268.
- Shatzberg, E. (1999). *Wings of Wood, Wings of Metal: Culture and Technical Choice in American Airplane Materials, 1914–1945*. Princeton, NJ: Princeton University Press.
- Shepardson, D. (2019). "FAA must ramp up staffing to oversee airplane certification after 737 MAX-panel." *Reuters*. October 11, 2019. <https://www.nasdaq.com/articles/faa-must-ramp-up-staffing-to-oversee-airplane-certification-after-737-max-panel-2019-10-11> (accessed March 11, 2023).
- Shewhart, W. (1931). *Economic Control of Manufactured Product*. New York: D. van Nostrand.

- Shinners, S. (1967). *Techniques of System Engineering*. New York: McGraw-Hill.
- Shivastava, P. (1987). *Bhopal: Anatomy of a Crisis*. Cambridge, MA: Ballinger.
- Shrader-Frechette, K. (1980). "Technology Assessment as Applied Philosophy of Science." *Science, Technology, & Human Values* 6(33): 33–50.
- Sieg, L., and Kubota, Y. (2012). "Nuclear Crisis Turns Japan Ex-PM Kan into Energy Apostle." *Reuters*, February 17, 2012. <http://www.reuters.com/article/2012/02/17/us-japan-kan-idUSTRE81G08P20120217> (accessed September 7, 2015).
- Silbey, S. (2009). "Taming Prometheus: Talk about Safety and Culture." *Annual Review of Sociology* 35(1): 341–369.
- Simons, G. M. (2012). *Concorde Conspiracy: The Battle for American Skies 1962–77*. London: The History Press.
- Sims, B. (1999). "Concrete Practices: Testing in an Earthquake-Engineering Laboratory." *Social Studies of Science* 29(4): 483–518.
- Sismondo, S. (2017). "Post-Truth?" *Social Studies of Science* 47(1): 3–6.
- Sismondo, S. (2010). *An Introduction to Science and Technology Studies*, 2nd ed. Chichester, UK: Blackwell.
- Sjöberg, L. (2004). "Local Acceptance of a High-Level Nuclear Waste Repository." *Risk Analysis* 24(3): 737–749.
- Slayton, R., and Spinardi, G. (2016). "Radical Innovation in Scaling Up: Boeing's Dreamliner and the Challenge of Socio-Technical Transitions." *Technovation* 47: 47–58.
- Slovic, P. (2012). "The Perception Gap: Radiation and Risk." *Bulletin of the Atomic Scientists* 68(3): 67–75.
- Smith, J. (1981). "FAA Is Cool to Cabin Safety Improvements." *Science* 211(4482): 557–560.
- Smith, G., and Mindell, D. (2000). "The Emergence of the Turbofan Engine." In Galison, P. and Roland, A. (Eds.), *Atmospheric Flight in the Twentieth Century*, 107–155. Boston: Kluwer.
- Smith, J. (2009). "High-Priced F-22 Fighter Has Major Shortcomings." *Washington Post*, July 10.
- Smith, O. (2013). "Rear-Facing Aircraft Seats 'Safer.'" *The Telegraph*, July 10, 2013.
- Smith, O. (2017). "13 Unbelievable Statistics about Air Travel." *The Telegraph*, September 20. <https://www.telegraph.co.uk/travel/lists/surprising-things-about-air-travel/> (accessed September 27, 2018).
- Snook, S. (2000). *Friendly Fire*. Princeton, NJ: Princeton University Press.
- Snyder, R. (1982). "Impact Protection in Air Transport Passenger Seat Design." *SAE Transactions* 91(4): 4312–4337.
- Soble, J. (2014). "Beware the Safety Myth Returning to Japan's Nuclear Debate." *Financial Times*, July 13.

- Socolow, R. (2011). "Reflections on Fukushima: A Time to Mourn, to Learn, and to Teach." *Bulletin of the Atomic Scientists*, March 21. <http://www.thebulletin.org/web-edition/op-eds/reflections-fukushima-time-to-mourn-to-learn-and-to-teach> (accessed September 17, 2017).
- Spiegelhalter, D. (2017). "Risk and Uncertainty Communication." *Annual Review of Statistics and Its Application* 4: 31–60.
- Spinardi, G. (2002). "Industrial Exploitation of Carbon Fibre in the UK, USA and Japan." *Technology Analysis & Strategic Management* 14(4): 381–398
- Spinardi, G. (2019). "Performance-Based Design, Expertise Asymmetry, and Professionalism: Fire Safety Regulation in the Neoliberal Era." *Regulation & Governance* 13(4): 520–539.
- Srinivasan, T., and Gopi Rethinaraj, T. (2013). "Fukushima and Thereafter: Reassessment of Risks of Nuclear Power." *Energy Policy* 52: 726–736.
- Stanford, K. (2009). *Exceeding Our Grasp: Science, History, and the Problem of Unconceived Alternatives*. Oxford: Oxford University Press.
- Starr, C. (1969). "Social Benefits Versus Technological Risks." *Science* 165 (3899): 1232–1238
- Stevens, M., and Mele, C. (2018). "Causes of False Missile Alerts: The Sun, the Moon and a 46-Cent Chip." <https://www.nytimes.com/2018/01/13/us/false-alarm-missile-alerts.html> (accessed September 9, 2021).
- Stigler, G. J. (1971). "The Theory of Economic Regulation." *Bell Journal of Economics and Management Science* 2(1): 3–21.
- Stilgoe, J. (2018). Machine Learning, Social Learning and the Governance of Self-Driving Cars. *Social Studies of Science* 48(1): 25–56.
- Stimpson, E., and McCabe, W. (November 2008). "Managing Risks in Civil Aviation." *Aero Safety World*. Flight Safety Foundation.: 10-14. https://flightsafety.org/wp-content/uploads/2016/12/asw_nov08_p10-14.pdf (accessed March 10, 2023).
- Stoller, G. (2001). "Engineer Has Alternate Theory on Plane Disaster." *USA Today*, April. http://www.iasa.com.au/folders/Safety_Issues/RiskManagement/alohaagain.html (accessed February 16, 2012).
- Strathern, M. (Ed.). (2000). *Audit Cultures: Anthropological Studies in Accountability, Ethics and the Academy*. New York: Routledge.
- Sutharshan, B., Mutyala, M., Vijuk, R. P., and Mishra, A. (2011). "The AP1000TM Reactor: Passive Safety and Modular Design." *Energy Procedia* 7: 293–302.
- Suvrat, R. (2016). "Estimating the Frequency of Nuclear Accidents." *Science & Global Security*: 37–62.
- Swenson, L., Grimwood, J., and Alexander, C. (1998). *This New Ocean: A History of Project Mercury*. Washington, DC: NASA History Office.
- Taebi, B. (2017). "Bridging the Gap between Social Acceptance and Ethical Acceptability." *Risk Analysis* 37(10): 1817–1827.

- Taebi, B., Roeser, S., and van de Poel, S. (2012). "The Ethics of Nuclear Power: Social Experiments, Intergenerational Justice, and Emotions." *Energy Policy* 202–206.
- Tamuz, M. (1987). "The Impact of Computer Surveillance on Air Safety Reporting." *Columbia Journal of World Business* 22: 69–77.
- Tamuz, M. (2001). "Learning Disabilities for Regulators." *Administration & Society* 33(3): 276.
- Tenney, D., Davis, J., Pipes, R. B., and Johnston, N. (2009). "NASA Composite Materials Development: Lessons Learned and Future Challenges." NATO Research and Technology Agency (RTA) AVT 164—Support of Composite Systems Fall 2009—Bonn.
- Thorpe, J. (2003). "Fatalities and Destroyed Civil Aircraft Due to Bird Strikes, 1912–2002" *Paper presented to International Bird Strike Committee*. Warsaw, 5–9 May, online: https://web.archive.org/web/20090227072007/http://www.int-birdstrike.org/Warsaw_Papers/IBSC26_WPSA1.pdf (accessed February 24, 2023).
- Tkacik, M. (2019). "Crash Course: How Boeing's Managerial Revolution Created the 737 MAX Disaster." *New Republic*, September 18. <https://newrepublic.com/article/154944/boeing-737-max-investigation-indonesia-lion-air-ethiopian-airlines-managerial-revolution> (accessed May 8, 2020).
- Tootell, B. (1985). "All Four Engines Have Failed": *The True and Triumphant Story of BA 009 and the "Jakarta Incident."* London: Andre Deutsch.
- Topham, G. (2020). "'Designed by Clowns': Boeing Messages Raise Serious Questions about 737 Max." *The Guardian*, January 10. <https://www.theguardian.com/business/2020/jan/09/boeing-737-max-internal-messages> (accessed August 8, 2020).
- Transocean. (2010). "Fleet Specifications: Deepwater Horizon." Archived from original, June 19. <https://web.archive.org/web/20100619121120/http://www.deepwater.com/fw/main/Deepwater-Horizon-56C17.html> (accessed 04/03/2019).
- Transportation Safety Board of Canada (TSB). (2007). *Aviation Investigation Report Loss of Rudder in Flight: Air Transat Airbus A310-308 C-GPAT Miami, Florida, 90 nm S 06 March 2005*. Report Number A05F0047. Minister of Public Works and Government Services Canada 2007 Cat. No. TU3-5/05-2E.
- Turner, B. A. (1976). "The Organizational and Interorganizational Development of Disasters." *Administrative Science Quarterly* 21(3): 378–397.
- Turner, B. A. (1978). *Man-Made Disasters*. London: Wykeham.
- Turner, B. A., and Pidgeon, N.F. (1997). *Man-Made Disasters*. 2nd ed. Oxford, UK: Butterworth-Heinemann.
- Twombly, I. (2017). "Fly-by-Wire: The Computer Takes Control." *Flight Training Magazine*. Aircraft Owners and Pilots Association. July 1. <https://www.aopa.org/news-and-media/all-news/2017/july/flight-training-magazine/fly-by-wire> (accessed April 4, 2019).
- Uhlmann, D. (2020). "BP Paid a Steep Price for the Gulf Oil Spill but for the US a Decade Later, It's Business as Usual." *The Conversation*. <https://theconversation.com/bp-paid-a-steep-price-for-the-gulf-oil-spill-but-for-the-us-a-decade-later-its-business-as-usual-136905> (accessed July 27, 2020).

- Union of Concerned Scientists (UCS). (2015). "Close Calls with Nuclear Weapons." <https://www.ucsusa.org/sites/default/files/attach/2015/04/Close%20Calls%20with%20Nuclear%20Weapons.pdf> (accessed September 9, 2021).
- Unruh, G. C. (2000). "Understanding Carbon Lock-in." *Energy Policy* 28: 817–830.
- US Airways. (February 18, 1999). "Comments on NPRM #FAA-1998-4815." Docket (53265).
- US Congress. (1996). "Aviation Safety: Issues Raised by the Crash of ValuJet Flight 592." Hearing before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, House of Representatives, One Hundred and Fourth Congress. Second session. June 25, 1996. US Government Printing Office: Washington, DC.
- US Department of Defense (DoD). (May 17, 1999). *Human Engineering Program Process and Procedures, MIL-HDBK-46855A*. Washington, DC: US Department of Defense.
- US Department of Defense (DoD). (February 10, 2000). *Standard Practice for System Safety, MIL-STD-882D*. Washington, DC: US Department of Defense.
- US Department of Justice (DoJ). (January 7, 2021). "Boeing Charged with 737 Max Fraud Conspiracy and Agrees to Pay over \$2.5 Billion" (Press release). Washington, DC: US Department of Justice. <https://www.justice.gov/opa/pr/boeing-charged-737-max-fraud-conspiracy-and-agrees-pay-over-25-billion> (accessed March 16, 2023).
- Useem, J. (2019). "The Long-Forgotten Flight That Sent Boeing off Course." *The Atlantic*, November 20. <https://www.theatlantic.com/ideas/archive/2019/11/how-boeing-lost-its-bearings/602188/> (accessed March 27, 2021).
- US Environmental Protection Agency (EPA). (2009). *Cancer Risk Coefficients for Environmental Exposure to Radionuclides*. Federal Guidance Report No.13. EPA 402-R99-001. Washington, DC: US Environmental Protection Agency.
- US Federal Aviation Administration (FAA). (1970). "Turbine Engine Foreign Object Ingestion and Rotor Blade Containment Type Certification Procedures." Advisory Circular AC 33-1 B, April 22. Washington, DC: Department of Transportation.
- US Federal Aviation Administration (FAA). (1982). "System Design Analysis." Advisory Circular AC 25.1309-1. Washington, DC: Department of Transportation.
- US Federal Aviation Administration (FAA). (1988). "System Design and Analysis." Advisory Circular (AC) 25.1309-1A. Washington, DC: Department of Transportation.
- US Federal Aviation Administration (FAA). (1998a). "Aircraft Certification Mission Statement." Aircraft Certification Service (AIR) Headquarters Office Home Page. <http://www.faa.gov/avr/air/hq/mission.htm>. February 10. Washington, DC: Department of Transportation.
- US Federal Aviation Administration (FAA). (1998b). "Airworthiness Standards; Bird Ingestion: Notice of Proposed Rulemaking (NPRM). CFR Parts 23, 25 and 33." Docket No. FM-1998-4815; Notice No. 98-18j RIN 21200AF34. Washington, DC: Department of Transportation.
- US Federal Aviation Administration (FAA). (1999a). "The FAA and Industry Guide to Product Certification." Notice N8110.80, January 26. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (1999b) "Guidance for Reviewing Certification Plans to Address Human Factors for Certification of Transport Airplane Flight Decks." Memorandum ANM-99-2. September 29, 1999. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (2000). "Airworthiness Standards; Bird Ingestion." 14 CFR Parts 23, 25 and 33; Docket No. FAA-1998-4815; Amendment No. 23-54, 25-100, and 33-20. RIN 2120-AF84. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (2001). "Bird Ingestion Certification Standards." Advisory Circular AC 33.76, January 19. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (2002a). "Commercial Airplane Certification Process Study." March 2002. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (2002b). "System Design and Analysis." Advisory Circular (AC) 25.1309-1B. Arsenal Draft. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (2002c). "System Design and Analysis Harmonization and Technology Update." Aviation Rulemaking Advisory Committee. Draft R6X Phase 1—June 2002. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (2003). "Identification of Flight Critical System Components." Memorandum ANM-03-117-10. July 24. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (2004). "Response to Comments on NPA-E-20." <http://www.jaa.nl/section1/crd/crd%20for%20npa%20e-20.doc> (accessed March 7, 2015).

US Federal Aviation Administration (FAA). (2005a). *Designee Management Handbook*. FAA Order 8100.8B. July 14. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (2005b). "Type Certification." Order 8110.4C. October 26. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (2007). "Guide for Obtaining a Supplemental Type Certificate." Advisory Circular No. 21-40A. September 27. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (2008a). "Assessment of FAA's Risk-Based System for Overseeing Aircraft Manufacturers' Suppliers." No. AV-2008-026. Washington, DC: Department of Transportation

US Federal Aviation Administration (FAA). (2008b). "Passenger Cabin Smoke Protection." Advisory Circular AC 25.795-4. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (2009). "Bird Ingestion Certification Standards." Advisory Circular AC No: 33.76-1A. Washington, DC: Department of Transportation.

US Federal Aviation Administration (FAA). (2014). "Wildlife Strikes to Civil Aircraft in the United States 1990-2013." Federal Aviation Administration National Wildlife

- Strike Database Serial Report Number 20. July. Washington, DC: Department of Transportation.
- US Federal Aviation Administration (FAA). (2016). "A Study into the Structural Factors Influencing the Survivability of Occupants in Airplane Accidents." DOT/FAA/TC-16/31. Washington, DC: Department of Transportation.
- US Fish and Wildlife Service (FWS). (2013). "Waterfowl Population Status." Washington, DC: US Department of the Interior.
- US Government Accountability Office (GAO). (August 1992). "Aircraft Certification: Limited Progress on Developing International Design Standards." Report to the Chairman, Subcommittee on Aviation, Committee on Public Works and Transportation, Report No. 147597.
- US Government Accountability Office (GAO). (1993). "Aircraft Certification: New FAA Approach Needed to Meet Challenges of Advanced Technology." GAO Report to the Chairman, Subcommittee on Aviation, Committee on Public Works and Transportation, House of Representatives. GAO/RCED-93-155, September 16.
- US Government Accountability Office (GAO). (1995). "Aircraft Requirements: Air Force and Navy Need to Establish Realistic Criteria for Backup Aircraft." GAO/NSIAD-95-180. Report to Congressional Requesters. September.
- US Government Accountability Office (GAO). (2004). "Aviation Safety: FAA Needs to Strengthen the Management of Its Designee Programs." Report to the Ranking Democratic Member, Subcommittee on Aviation, Committee on Transportation and Infrastructure. House of Representatives. October. <http://www.gao.gov/cgi-bin/getrpt?GAO-05-40> (accessed March 10, 2023).
- US Nuclear Regulatory Commission (NRC). (1983). "Handbook of Human Reliability Analysis with Emphasis on Nuclear Power Plant Applications." NUREG/CR—1278. Washington, DC: US Department of Energy.
- US Nuclear Regulatory Commission (NRC). (2004). "Effective Risk Communication: The Nuclear Regulatory Commission's Guidelines for External Risk Communication." Report NUREG/BR-0308. January. Washington, DC: US Department of Energy.
- US Nuclear Regulatory Commission (NRC). (2009). "Frequently Asked Questions about License Applications for New Nuclear Power Reactors." NUREG/BR-0468. Rockville, MD: Office of New Reactors, Nuclear Regulatory Commission.
- US Nuclear Regulatory Commission (NRC). (2010). "Generic Issue 199 (GI-199): Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants." August. Washington, DC: US Department of Energy.
- Van Maanen, J., and Pentland, B. (1994). "Cops and Auditors: The Rhetoric of Records." In Sitkin, S. B. and Bies, R. J. (Eds.), *The Legalistic Organization*. Newbury Park, CA: SAGE.
- Vasigh, B., Flemming, K., and Humphreys, B. (2015). *Foundations of Airline Finance: Methodology and Practice*, 2nd ed. London: Routledge.
- Vaughan, D. (1996). *The Challenger Launch Decision*. Chicago: University of Chicago Press.

- Vaughan, D. (1999). "The Dark Side of Organizations: Mistake, Misconduct, and Disaster." *Annual Review of Sociology* 25: 271–305.
- Vaughan, D. (2004). "Theorizing Disaster: Analogy, Historical Ethnography, and the Challenger Accident." *Ethnography* 5(3): 313–345.
- Vaughan, D. (2005). "Organizational Rituals of Risk and Error." In Hutter, B. and Power, M. (Eds.), *Organizational Encounters with Risk*. New York and Cambridge: Cambridge University Press.
- Vaughan, D. (2021). *Dead Reckoning: Air Traffic Control, System Effects, and Risk*. Chicago: University of Chicago Press.
- Verran, H. (2012). "Number." In Celia, L. and Wakeford, N. (Eds.), *Inventive Methods: The Happening of the Social*. London: Routledge.
- Villemeur, A. (1991). *Reliability, Availability, Maintainability and Safety Assessment*. Vol. 1 Chichester, UK: John Wiley & Sons.
- Vincenti, W. G. (1979). "The Air Propellor Tests of W. F. Durand and E. P. Lesley: A Case Study in Technological Methodology." *Technology and Culture* 20: 712–751.
- Vincenti, W. G. (1990). *What Engineers Know and How They Know It: Analytical Studies from Aeronautical History*. Baltimore: Johns Hopkins University Press.
- Vincenti, W. G. (1994). "The Retractable Airplane Landing Gear and the Northrop 'Anomaly': Variation-Selection and the Shaping of Technology." *Technology and Culture* 35: 1–33.
- Vincenti, W. G. (1997). "Engineering Theory in the Making: Aerodynamic Calculation 'Breaks the Sound Barrier.'" *Technology and Culture* 38: 819–825.
- von Neumann, J. (1956). "Probabilistic Logics and Synthesis of Reliable Organisms from Unreliable Components." *Annals of Mathematics Studies* 34: 43–98.
- Vosteen, L., and Hadcock, R. (1994). *Composite Chronicles: A Study of Lessons Learned in the Development, Production, and Service of Composite Structures*. Hampton, VA: National Aeronautics and Space Administration.
- Waddington, T. (2000). *McDonnell Douglas DC-10*. Miami: World Transport Press.
- Wall, M. (2016). "How a 1967 Solar Storm Nearly Led to Nuclear War." Space.com, August 9. <https://www.space.com/33687-solar-storm-cold-war-false-alarm.html> (accessed September 9, 2021).
- Waltz, M. (2006). "The Dream of Composites." *R&D Magazine*, November 20. <https://www.rdmag.com/article/2006/11/dream-composites> (accessed April 4, 2019).
- Wanhill, R. (2002). *Milestone Case Histories in Aircraft Structural Integrity*. NLR-TP-2002-521. Amsterdam: Nationaal Lucht- en Ruimtevaartlaboratorium.
- Warwick, G. (1986). "Beech's Enterprising Starship." *Flight International*, May 3: 18–22.
- WashingtonsBlog. (2013). "Fake Science Alert: Fukushima Radiation Can't Be Compared to Bananas or X-Rays." April 1. <http://www.washingtonsblog.com/2013/04/fake-science-alert-fukushima-radiation-cant-be-compared-to-bananas-or-x-rays.html> (accessed October 20, 2015).

- Weart, S. (1988). *Nuclear Fear: A History of Images*. Cambridge, MA: Harvard University Press.
- Weick, K. E. (1998). "Foresights of Failure: An Appreciation of Barry Turner." *Journal of Contingencies and Crisis Management* 6(2): 72–75.
- Weick, K. E., and Sutcliffe, K. M. (2001). *Managing the Unexpected: Assuring High Performance in an Age of Complexity*. Jossey-Bass: San Francisco.
- Weir, A. (2000). *The Tombstone Imperative: The Truth about Air Safety*. London: Simon & Schuster.
- Wellock, T. R. (2017). "A Figure of Merit: Quantifying the Probability of a Nuclear Reactor Accident." *Technology and Culture; Baltimore* 58(3): 678–721.
- Wellock, T. (2021). *Safe Enough? A History of Nuclear Power and Accident Risk*. Berkeley: University of California Press.
- White, R. (2016). *Into the Black: The Electrifying True Story of How the First Flight of the Space Shuttle Nearly Ended in Disaster*. London: Transworld.
- Wiener, E., Kanki, B., and Helmreich R. (Eds.). (1993). *Cockpit Resource Management*. San Diego: Academic Press.
- Wildavsky, A. (1988). *Searching for Safety*. Oxford, UK: Transaction.
- Wiley, J. (1986). "A Capture Theory of Antitrust Federalism." *Harvard Law Review* (99): 713–723.
- Wilson, A. (1973). *The Concorde Fiasco*. London: Penguin Special.
- Wittgenstein, L. (2001 [1953]). *Philosophical Investigations*. London: Blackwell Publishing.
- Wolf, F. (2001). "Operationalizing and Testing Normal Accident Theory in Petrochemical Plants and Refineries." *Production and Operations Management* 10: 292–305.
- World Nuclear Association. (2019). "Nuclear Power in the World Today." <https://www.world-nuclear.org/information-library/current-and-future-generation/nuclear-power-in-the-world-today.aspx> (accessed August 6, 2019).
- Wright, T.P. (1936). "Factors Affecting the Cost of Airplanes." *Journal of the Aeronautical Sciences* 3: 122–128.
- Wu, J. S., and Apostolakis, G. E. (1992). Experience with Probabilistic Risk Assessment in the Nuclear Power Industry. *Journal of Hazardous Materials* 29(3): 313–345.
- Wynne, B. (1988). "Unruly Technology: Practical Rules, Impractical Discourses and Public Understanding." *Social Studies of Science* 18: 147–167.
- Wynne, B. (1989). "Frameworks of Rationality in Risk Management: Towards the Testing of Naive Sociology." *Environmental Threats: Social Sciences Approaches to Public Risk Perceptions*: 33–45.
- Wynne, B. (2003). "Seasick on the Third Wave? Subverting the Hegemony of Propositionalism." *Social Studies of Science* 33(3): 401–417.
- Wyss, G. (2016). "The Accident That Could Never Happen: Deluded by a Design Basis." In Sagan, S. and Blandford, E. (Eds.), *Learning from a Disaster*. Stanford, CA: Stanford University Press.

Yanagisawa, K., Imamura, F., Sakakiyama, T., Annaka T., Takeda, T., and Shuto, N. (2007). "Tsunami Assessment for Risk Management at Nuclear Power Facilities in Japan." *Pure and Applied Geophysics* 164: 565–576.

Younossi, O., Kennedy, M., Graser, J.C. (2001). *Military Airframe Costs: The Effects of Advanced Materials and Manufacturing Processes*. RAND Corporation, Santa Monica, CA.

Zdzislaw, K, Szczepanski, P., and Balazinski, M. (2007). "Causes and Effects of Cascading Failures in Aircraft Systems." *Diagnostyka* 1(41): 19–26.

Zimmel, T. (March 2004). "Quality Science: A Historical Perspective. Part 1: The Early Years." http://www.msi.ms/MSJ/QUALITY_historical_1_20000603.htm (accessed July 5, 2014).

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