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Fukushima Daiichi Nuclear Disaster Bibliography

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Description

A bibliography looking at the engineering ethics and policy issues related to the Fukushima Daiichi nuclear disaster.

Body

Overview and Continuing Coverage of the Fukushima Disaster

IEEE Spectrum. [Fukushima and the Future of Nuclear Energy.](#)

A collection of articles, an interactive timeline and current developments related to the Fukushima Nuclear Disaster and how other countries are changing their nuclear energy policy after this event.

PBS Frontline. 2012. [Inside Japan's Nuclear Meltdown. \(February 28\).](#)

An excellent, hour-long video that looks at the desperate hours and days after the

Fukushima nuclear disaster. The video tells the story of the citizens, engineers, fireman and soldiers who worked to help prevent the Daiichi nuclear complex from complete meltdown through eyewitness testimony from people working on the front lines and footage from inside the plant.

Engineering Ethics

For another, excellent bibliography that includes a number of articles on the Fukushima Disaster, see [Ethical Issues in Physics](#), a bibliography compiled in 2012 by Marshall Thomsen.

Amir, Sulfikar and Kohta Juraku. 2014. Understanding disaster: engineering and epistemological bias in the Fukushima nuclear crisis. *Engineering Studies* 6(3): 210-216. doi: [10.1080/19378629.2014.976570](https://doi.org/10.1080/19378629.2014.976570).

The world had a sense of déjà vu when a massive earthquake and a 15 m tsunami struck the Fukushima Daiichi nuclear power station on 11 March 2011. Nuclear engineers in Japan were trying their best to overcome the situation, believing that their technical knowledge was adequate to understand what went wrong and to mitigate the crisis. In reality, the subsequent problems emerging in the Fukushima nuclear crisis went beyond the expectations of the engineers. Focusing on the emergency period of the Fukushima nuclear disaster, this article critically examines epistemological bias that prompted how Japanese top-level nuclear engineers made inaccurate assessments resulting in the prolonged crisis.

Brumfiel, Geoff and Ichiko Fuyuno. 2012. [Japan's Nuclear Crisis: Fukushima's Legacy of Fear](#). *Nature News*. (March 7).

Over 100,000 people were displaced by the Fukushima disaster. Though many evacuees can now safely return home, public mistrust in the government and scientists who receive public funding are keeping many from returning.

Davis, M. 2012. Three Nuclear Disasters and a Hurricane: Some Reflections on Engineering Ethics. *Journal of Applied Ethics and Philosophy*, 4, 1-10.

The nuclear disaster that Japan suffered at Fukushima in the months following March 11, 2011 has been compared with other major nuclear disasters, especially, Three Mile Island (1979) and Chernobyl (1986). Yet Fukushima is not just another nuclear disaster. In ways important to engineering ethics, it is much more like Katrina's destruction of New Orleans than like any nuclear disaster. One lesson of Fukushima,

one shared with Katrina, concerns the different roles engineers have at different stages in an engineering project (planning, designing, management, and operations). Another lesson concerns our ideas of heroism, especially our sense that heroism is sometimes one's duty. An engineer's duty sometimes includes protecting others from harm even at the risk of the engineer's life.

Fackler, Martin. 2013. [Japan Stepping In to Help Clean Up Atomic Plant](#). *New York Times*. (August 7).

In an effort to rebuild public trust in nuclear power and the Japanese government's ability to regulate this industry, Japan's prime minister Shinzo Abe has ordered his government to intervene in the clean-up of the Fukushima Daiichi plant.

Fahlquist, Jessica Nihlen and Sabine Roeser. 2015. Nuclear energy, responsible risk communication and moral emotions: a three level framework. *Journal of Risk Research*. 18(3) 333-346.

Communication about nuclear risks is tricky, especially after Fukushima. It requires not only consideration about a message's effectiveness, but also about ethical legitimacy. This paper gives a three-level framework for morally responsible risk communication focusing on procedure, the message, and the effects of risk communication.

Fujiyoshi, M. 2014. Prologue to catastrophe. *Bulletin Of The Atomic Scientists*, 70(2), 36-41. doi: [10.1177/0096340214523240](#).

An eyewitness account from a worker at the **Fukushima** Daiichi Nuclear Power Station about happened there on March 11, 2011, in the immediate wake of a massive earthquake and tsunami that caused three of the station's reactor cores to melt.

Funabashi, Y., & Kitazawa, K. 2012. Fukushima in review: A complex disaster, a disastrous response. *Bulletin Of The Atomic Scientists*, 68(2), 9-21. doi: [10.1177/0096340212440359](#).

In this article, the program director of the independent panel charged by the Rebuild Japan Initiative Foundation to review the response of the Tokyo Electric Power Company (Tepco), government officials, and other actors responded to the Fukushima disaster. The panel found that these players were thoroughly unprepared on almost every level for the cascading nuclear disaster. This lack of preparation was caused, in part, by a public myth of "absolute safety" that nuclear power proponents had nurtured over decades and was aggravated by dysfunction within

and between government agencies and Tepco, particularly in regard to political leadership and crisis management.

Glaser, A. 2011. After Fukushima: Preparing for a more uncertain future of nuclear power. *Engineering Management Review, IEEE, 39(4), 19-27. doi: [10.1109/EMR.2011.6093884](https://doi.org/10.1109/EMR.2011.6093884).*

The Fukushima accidents have changed the proposition of a nuclear renaissance in ways that cannot yet be fully anticipated, but it is likely that the impact on the future of nuclear power will be significant—perhaps more so than Chernobyl was—because Fukushima happened at a pivotal moment in the energy and climate debate. This article reviews the very different responses to the accidents in the United States and Germany, and suggests a key lesson is the importance of developing energy policy options that can accommodate radical change.

Guarnieri, F., & Travadel, S. 2014. Engineering thinking in emergency situations: A new nuclear safety concept. *Bulletin Of The Atomic Scientists, 70(6), 79-86. doi: [10.1177/0096340214555109](https://doi.org/10.1177/0096340214555109).*

Lessons learned from the Fukushima Daiichi accident have focused on preventative measures designed to protect nuclear reactors and crisis management plans. This article looks at how engineers have handled the aftermath of this disaster and how it can offer new insight into the capacity of organizations and individuals to adapt to situations where what actually happened far exceeds the scope of safety standards based on probabilistic risk assessment. These kinds of situations call for “engineering thinking in emergency situations. In the future, nuclear safety oversight authorities should assess the ability of plant operators to create and implement effective engineering strategies on the fly, and should require that operators demonstrate the capability for resilience in the aftermath of an accident.

Hatamura, Y. o. o., Abe, S., Fuchigami, M., Kasahara, N., & Iino, K. 2015. *The 2011 Fukushima nuclear power plant accident : how and why it happened, Cambridge, UK: Woodhead Publishing.*

A definitive account of the 2011 Fukushima nuclear power plant accident written by committee members of the official Japanese Government investigation panel.

Jones, Christopher, Krishanu Saba, Sebastian Pfothenaur and Shelia Jasanoff. 2012. [Learning from Fukushima](#). *Issues in Science and Technology 28(3): 79-84.*

The article offers the authors’ insights on the lessons learned after the nuclear

failure at the Fukushima Daiichi reactors in Japan in March 2011. The authors state that the nuclear disaster was due to the technology failure and poor regulations or corporate greed. Moreover, the three lessons from the Fukushima disaster are the removal of politics from technological design, national and global ramifications of nuclear power, and available method is prevented by sociotechnical systems.

Katensberg, William E. 2015. Ethics, risk, and safety culture: reflections on Fukushima and beyond. Journal of Risk Research. 18(3): 304-316. doi: [10.1080/13669877.2014.896399](https://doi.org/10.1080/13669877.2014.896399).

Most of the investigations and published reports concerning the Fukushima Nuclear Power Plant accident have focused on the design, operation, and regulation of the power plants. This paper focuses on the ethics, risk, and safety culture with respect to the individuals and organizations responsible for the design, operation, and regulation of the nuclear power plants, namely the people. More specifically, this paper discusses the relationship between safety culture and societal culture, and how it may have influenced the accident at Fukushima.

Lochbaum, David A. 2014 Fukushima: the Story of Nuclear Disaster. New York: New York Press.

This book gives a minute-by-minute overview of the technical breakdown of the Fukushima Daiichi nuclear plant, backed by the science underlying the boiling-water reactors and the systems designed to prevent their meltdown. The book also looks at the human side of the story from the actions of the staff to help contain the after-effects of the accident, the actions of public officials, and the trauma of the evacuees and how their homes and livelihoods were impacted.

National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission. [The official report of the Fukushima Nuclear Accident Independent Investigation Commission](#). 86 pages.

Report from an independent commission called by the Japanese government to review the facts of the Fukushima nuclear accident and to strengthen oversight of nuclear power in Japan.

National Research Council (U.S.) 2014. [Lessons learned from the Fukushima nuclear accident for improving safety and security of us nuclear plants](#). Washington: The National Academies Press.

Lessons Learned from the Fukushima Nuclear Accident for Improving Safety and Security of U.S. Nuclear Plants is a study of the Fukushima Daiichi accident. This

report examines the causes of the crisis, the performance of safety systems at the plant, and the responses of its operators following the earthquake and tsunami. The report then considers the lessons that can be learned and their implications for U.S. safety and storage of spent nuclear fuel and high-level waste, commercial nuclear reactor safety and security regulations, and design improvements.

Normville, Dennis. 2011. Fukushima Revives the Low-Dose Debate. *Science*. 332(6032): 908-910. doi: [10.1126/science.332.6032.908](https://doi.org/10.1126/science.332.6032.908).

The disaster at Japan's Fukushima Daiichi nuclear power plant has thrust several thousand of Fukushima's 2 million residents into the middle of a scientific debate about the health effects of long-term exposure to low levels of radiation. Some researchers believe even unavoidable background radiation can be a factor in causing cancer, while others argue that tiny doses of radiation are not harmful. Studies in Fukushima could help clarify the picture.

Onishi, N. and M. Fackler. 2011. [Japan Held Nuclear Data, Leaving Evacuees in Peril](#). *New York Times* (August 8).

Discusses how after the Fukushima disaster, Japanese government officials failed to release needed information about radioactive emissions, leaving many evacuees exposed to danger.

Perrow, Charles. 2011. Fukushima and the Inevitability of Accidents. *Bulletin of the Atomic Scientists*. 67(6): 44-52. doi: [10.1177/0096340211426395](https://doi.org/10.1177/0096340211426395).

Governments regulate risky industrial systems such as nuclear power plants in hopes of making them less risky. However, recent history has shown us that despite our best efforts, mistakes will be made and **accidents** will inevitably occur in the complex, tightly coupled systems of modern society, resulting in the kind of unpredictable, cascading disaster seen at the **Fukushima** Daiichi Nuclear Power Station. Even with the best controls in place, some complex systems with catastrophic potential are just too dangerous to exist, because they cannot be made safe.

Strickland, Eliza. 2011. [Explainer: What Went Wrong in Japan's Nuclear Reactors](#). *IEEE Spectrum*. (March 16).

As part of the ongoing coverage of the incident by IEEE Spectrum, this article looks at both how the Fukushima Daiichi Nuclear plant is supposed to work, and what went wrong following the earthquake on Friday, March 11, 2011.

Suzuki, T. (2011). Deconstructing the zero-risk mindset: The lessons and future responsibilities for a post-Fukushima nuclear Japan. *Bulletin Of The Atomic Scientists*, 67(5), 9-18. doi: [10.1177/0096340211421477](https://doi.org/10.1177/0096340211421477).

Months after the accident unfolded at the **Fukushima** Daiichi Nuclear Power Station, the nuclear crisis continues. Though the worst, it seems, has passed, many technical, social, legal, and economic hurdles must be overcome. In this article, the author revisits the tragedy at the nuclear station and highlights a few of the most pressing—and most challenging—of the government's plans. The author writes that **Fukushima** should contain lessons not just for Japan but for all 31 countries with nuclear power.

Tabuchi, H. 2012. [Inquiry Declares Fukushima Crisis a Man-Made Disaster](#). *New York Times* (July 5).

A report released by the Fukushima Nuclear Accident Independent Investigation Commission has been released. It found that the event was a man-made disaster that could and should have been prevented. The article summarizes the main findings of the report.

Xiang, H., & Zhu, Y. 2011). [The Ethics Issues of Nuclear Energy: Hard Lessons Learned from Chernobyl and Fukushima](#). *Online Journal of Health Ethics*, 7(2), 1-10.

The Japan nuclear disaster once again raised the ethical issues of nuclear energy programs. Based on the ethical principles of utilitarianism, nonmaleficence, beneficence, justice, disclosure, and autonomy, we need to take a more stringent approach on nuclear programs, improve nuclear safety, enhance risk management, full disclosure of facts, open communication to the public, and develop alternative green energies, such as wind, solar, and geothermal energy.

Policy Issues

Acton, James.M. and Mark. Hibbs. 2012. [Why Fukushima was Preventable](#), Carnegie Paper.

Public sentiment in many states has turned against nuclear energy following the March 2011 accident at Japan's Fukushima Daiichi Nuclear Power Station. The Fukushima accident was, however, preventable.

Bradford, Peter. 2012. Energy Policy: The Nuclear Landscape. *Nature*. 483: 151/152. doi: [10.1038/483151a](https://doi.org/10.1038/483151a).

The accident at Fukushima has convinced many countries to begin phasing out their dependence on nuclear power. However, economics rather than safety is likely to be the deciding factor in these debates, as cheaper forms of energy from natural gas and fears about the next disaster drive away potential investors.

Brooks, Thom 2011. After Fukushima Daiichi: New Global Institutions for Improved Nuclear Power Policy. *Ethics, Policy and Environment*.15(1): 63-69. doi: [10.1080/21550085.2012.67268](https://doi.org/10.1080/21550085.2012.67268).

This article argues for the importance of global institutions to regulate nuclear power. There are international agreements in place on the disposal of nuclear waste, but there remains a pressing need for an international agreement to ensure the safe maintenance of nuclear facilities.

Butler, C., Parkhill, K. A., & Pidgeon, N. F. 2011. Nuclear Power After Japan: The Social Dimensions. *Environment*, 53(6), 3-14. doi: [10.1080/00139157.2011.623051](https://doi.org/10.1080/00139157.2011.623051).

Following the declaration of a nuclear emergency in Japan, questions surrounding the use of nuclear power are again a major topic of public debate. The 9.0 magnitude earthquake and following tsunami that struck Japan on March 11, 2011, had devastating consequences for many people. The subsequent problems encountered at Japan's nuclear power plants, and particularly at Fukushima Daiichi, have raised questions about the future of nuclear energy worldwide.

Davies, S. 2011. What now for nuclear? *Engineering & Technology*, 6(4), 39-43. doi: [10.1049/et.2011.0402](https://doi.org/10.1049/et.2011.0402).

The public perception of **nuclear** energy has fallen after the Fukushima **nuclear** accident. The author speaks of how after the complete meltdown of the Chernobyl nuclear power plant 25 years ago, the public had been moving towards a towards a grudging acceptance of a **nuclear** future. Now, the future of nuclear power remains in the balance.

Elliot, David. 2013. *Fukushima: Impacts and Implications*. Basingstoke, Hampshire: Palgrave MacMillian.

The Fukushima nuclear disaster in March 2011 led Japan, and many other countries, to change their energy policies. Following Germany's example, some adopted nuclear phase-out plans, focusing instead on renewable energy. This book reviews

the disaster and its global impacts, looking in detail at public and governmental reactions as the scale of the disaster became clear, and at the social, environmental, economic, technological and political implications in Japan and worldwide.

Kazashi, N. 2012. The Invisible 'Internal Radiation' and the Nuclear System: Hiroshima-Iraq-Fukushima. *Ethics, Policy & Environment: A Journal of Philosophy and Geography*, 15(1), 37-43. doi: [10.1080/21550085.2012.672683](https://doi.org/10.1080/21550085.2012.672683).

>After the Fukushima disaster, citizens of Japan engaged once again in a heated debate over nuclear issues. The article overviews some of the central problems emerging from this debate: historical re-examination, talk of economical/geographical disparity and the risk of "internal radiation." The author talks about this critical wedge issue lying at the core of many nuclear controversies and presents some of the issues with which citizens of struggled during this situation.

Möller, N., & Wikman-Svahn, P. 2011. Black Elephants and Black Swans of Nuclear Safety. *Ethics, Policy & Environment: A Journal of Philosophy and Geography*, 14(3), 273-278. doi: [10.1080/21550085.2011.605853](https://doi.org/10.1080/21550085.2011.605853).

This article argues that while the accident in Fukushima was high-impact and outside regular expectations, it was not so much a 'black swan event'- or one that could not be predicted, but rather a black elephant. Like the elephant in the room that no one wants to talk about, the Fukushima disaster was an event where the possible risks were known but not properly addressed.

Nakamura, A., & Kikuchi, M. *What we know, and what we have not yet learned: triple disasters and the Fukushima nuclear fiasco in Japan. Public Administration Review* 71(6): 893-899. doi: [10.1111/j.1540-6210.2011.02437.x](https://doi.org/10.1111/j.1540-6210.2011.02437.x).

This article discusses how Japan has witnessed several other serious nuclear-related disasters in recent years, and asks how serious accident like Fukushima could occur in a modern, highly sensitive, nuclear-conscious country?, The answer to that central question is complex, involving not only political and administrative issues but also technical and human dimensions. The Fukushima debacle was the result of a lack of rigorous management and control of nuclear issues by both public authorities and private industry.

Samuels, Richard J. 2013. 3.11: Disaster and Change in Japan. Ithaca, N.Y.: Cornell University Press.

This book offers one of the first broad scholarly assessments of the Fukushima nuclear power plant disaster on Japan's government and society. The author explores Japan's post-earthquake actions in the areas of national security, energy policy, and local governance, and how reformers have used the disaster to push for Japan to overhaul its priorities and political processes.

Shockley, K. 2011. Fragility, Stability, and Our Ideals Regarding the Well-Being of Others: Reflections on Fukushima Daiichi. *Ethics, Policy & Environment: A Journal of Philosophy and Geography*, 14(3), 291-295. doi: [10.1080/21550085.2011.605856](https://doi.org/10.1080/21550085.2011.605856).

This paper discusses how cases like Fukushima indicate our failure to recognize the fragility of our nuclear power infrastructure – as well as other key infrastructures – to survive major disasters and how this fragility represents a lack of concern for the well-being of others.

Shrader-Frechette, K. 2011. Fukushima, Flawed Epistemology, and Black-Swan Events. *Ethics, Policy & Environment: A Journal of Philosophy and Geography*, 14(3), 267-272. doi: [10.1080/21550085.2011.605851](https://doi.org/10.1080/21550085.2011.605851).

In response to the Fukushima, Chernobyl, and Three Mile Island core melts, nuclear proponents allege they were 'black-swan events' -- extremely unlikely, at the tail of probability distributions. This paper argues that the black-swan claim is false because proffered core-melt-probability characterizations typically fall victim to at least three methodological-epistemological errors: data-trimming, confusing subjective probabilities with relative frequencies, and inconsistency.

Van de Poel, I. 2011. Nuclear Energy as a Social Experiment. *Ethics, Policy & Environment: A Journal of Philosophy and Geography*, 14(3), 285-290. doi: [10.1080/21550085.2011.605855](https://doi.org/10.1080/21550085.2011.605855).

The Fukushima nuclear accident contains various lessons for how we are to deal with nuclear risks. In this article, the author focuses on the lessons it implies for the predictability of risks of nuclear technology and, ultimately, on how decisions about the acceptability of nuclear energy technology are to be made.

Notes

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