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Safety, Responsibility, Ethics, and Engineering Bibliography

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Description

This bibliography contains an annotated list of several articles on safety and on how engineers are expected to address safety.

Body

Baum, Robert J. 1994. Engineers and the public: sharing responsibilities. In D.E. Wuest, ed. *Professional Ethics and Social Responsibility.* Lanham, MD: Rowman & Littlefield, 1994. 121-136.
This essay discusses the professional responsibility of engineers (indeed, of all professionals) to assist the general public to obtain information about risks associated with specific technological artifacts and systems that may be relevant to the public's health and welfare. However, the author argues that this does not mean that engineers should take a parental role. Individuals bear the primary responsibility for protecting their own interests, but engineers must take reasonable precautions ensure the safety of clients, workers, and the general public. The author also takes an in-depth look at engineering codes of ethics, and how they have dealt

with engineers' responsibility for public safety over the past sixty years.

Davis, Michael. 1997. Better communication between engineers and managers : Some ways to prevent many ethically hard choices. *Science and Engineering Ethics* 3(2) 171-212.
Using the Challenger disaster as an example, the author looks at some ways to improve communication between engineers as a way to help prevent accidents from occurring. Frequent, two-way conversation, can often help prevent some of the ethical issues faced by professional engineers. The article concludes with empirical evidence on the ways in which technical communication can break down, and makes nine recommendations for organizational change to help prevent this kind of breakdown from occurring.

Harris, Charles S., Michael Pritchard, and Michael J. Rabins. *Engineering Ethics: Concepts and Cases.* Belmont, CA: Wadsworth, 2009.
This classic textbook on engineering ethics offers a good discussion on the role safety places in the daily work of an engineer, as well as including a number of quality case studies.

Hollander, Rachelle. 1994. Is Engineering Safety just Business Safety? *International Journal of Applied Philosophy.* 8(2): 15-18.
This article discusses three examples to clarify how safety is a social construction that relies on the activities of scientists, engineers, businesses, governments, the law and individuals. The actions of all these individuals help shape safety, as shown through the examples of instances where misunderstandings, assumptions, decisions and actions made by engineers, manufacturers and workers all lead to preventable workplace injuries. The author also discusses the need for more attention to be paid to the issues and practices by which safety can be improved, and how scientists, engineers, and philosophers should include questions of safety in their research.

Hummels, Harry. 1999. Ethical challenges in a technological environment: The perspectives of engineers versus managers. *Science and Engineering Ethics* 5(1):55-72.
In a response to Davis's "Better communication between engineers and managers," Hummels discusses how moral trouble and safety problems can sometimes arise not only when communication between engineers and managers breaks down, but also when a common understanding exists about the safety (or danger) of a

situation.

Kazakidis, Vassilios and Rachel F. C. Haliburton. 1998. The mining engineer, moral luck, and professional accountability. *Science and Engineering Ethics* 4(4): 437-456.
This paper argues that engineers do bear responsibility when mining accidents occur, though depending on the circumstances surrounding any particular accident, ascriptions of moral 'responsibility' do not always mean that the engineer is morally 'blameworthy'. Often the responsibility lies somewhere between the engineer and other individuals such as mining company managers, workers, or even no one when “Acts of God” or natural disasters occur. The authors conclude that professional accountability and moral responsibility require that the mining engineer take practical steps to ensure that high safety standards are upheld, and that, when accidents occur, steps are taken to identify the causes so that similar tragedies can be avoided in the future.

Lynch, William and Kline, Ronald. 2000. Engineering practice and engineering ethics. S*cience, Technology and Human Values*. 25(2): 195-225.
The authors discuss Diane Vaughan's analysis of the causes of the Challenger accident, and the ways in which case studies such as this can be used to introduce engineering students to the ongoing construction of risk during mundane engineering practice as a way to better prepare them to address issues of public health, safety, and welfare that come up in a project before they require heroic intervention.

Macpherson, James A. E. 2008. Safety, risk acceptability, and morality. *Science and Engineering Ethics.* 14(3): 377-390.
This article gives a conceptual analysis of safety and argues that previous analyses of safety in terms of risk acceptability fail because the notion of risk acceptability is more subjective than safety, as risk acceptability takes into account potential benefits in a way that safety does not. The paper further explores questions about the nature of safety in relation to the potential of a thing to cause harm, as well as in relation to the potential of someone being harmed.

Mcfarland, Michael C. 1986. The public health, safety, and welfare: an analysis of the social responsibility of engineers. *IEEE Technology and Society Magazine.* 5(4): 18-26.

Discusses the obligations engineers have to protect the public interest in the creation and use of new technologies by means of case studies of engineers working in the nuclear power industry.

Pfatteicher, Sarah K. A. 2000. Walkways: tragedy and transformation in Kansas City. Forensic Engineering, Proceedings of the Second Forensic Congress. P.6.
Discusses the Kansas City Hyatt Regency Walkway Collapse and how this collapse provoked a large debate about the American Society of Civil Engineer's Ethics Code and engineers' responsibility to protect public safety.

Toole, Michael. 2007. Design engineers' responses to safety situations. *Journal of Professional Issues in Engineering Education & Practice.* 133(2): 126-131.
The article analyzes two safety situations that consulting design civil engineers often face, and how the decision criteria the engineer chooses would influence her decision. The article looks at the criteria the engineer may use - such as maximizing profits, complying with federal safety standard and complying with the American Society of Civil Engineering's Code of Ethics- and discusses how these analyses of different situations suggests the need for engineering firms to establish site safety-related policies and the changes that may be warranted in ASCE's Code of Ethics and the federal safety standards.

Unger, Stephen H. 2000. Examples of real world engineering ethics problems. *Science and Engineering Ethics.* 6(3) 423-430.
This article presents nine examples of the kinds of ethical problems encountered by engineers in their daily practice, ranging from situations where companies try to cheat one another to those in which human health and safety are jeopardized.

Van der Burg, Simone. Van Gorp, Anke. 2005. Understanding moral responsibility in the design of trailers. *Science and Engineering Ethics.* 11(2):235-256.
This article explores the moral philosophy of Alasdair MacIntyre and a case study of a team of engineers who design a truck's trailer without considering that traffic safety is part of their responsibility to show that moral codes often do not suffice to make agents understand their moral responsibility. The authors then discuss the need for a moral philosophy that helps engineers to interpret and think more critically about their professional responsibility, including the concept of safety.

Vesilind, P. and R.L. Rooke. 2001. The engineer shall hold paramount the health, safety, and welfare of the public. Unless, of course… *Proceedings of the International Symposium on Technology and Society.* (6-7 July 20001, Stamford, CT.):162-167.
Engineering codes of ethics commonly state in the first canon that the engineer shall hold paramount the health, safety, and welfare of the public. Although this is an unequivocal statement, engineers at times choose not to do so. In this paper the authors discuss five circumstances in which the engineer might choose not to hold the health, safety, and welfare of the public paramount: (1) if the engineers believes that the requirement is internally inconsistent, (2) if the engineer's religious convictions prevent adherence to the requirement, (3) if the engineer believes that the public does not know what is best for it, (4) if the engineer is forced to do otherwise, and (5) if the engineer believes that damage to the environment outweighs short term public interest.

Wetmore, Jameson M. 2008. Engineering with uncertainty: Monitoring air bag performance. *Science and Engineering Ethics.* 14(2): 201-218.
Modern engineering is filled with uncertainties, and in some cases these uncertainties can prove to have adverse consequences can include possible health and safety implications. However, due to the inherent limits of testing and the complexities of the world outside the lab, engineers will never be able to fully predict how their creations will behave. However, one way of dealing with this uncertainty in some cases is to actively monitor technologies once they have left the development and product stage. This article discusses an instance in the history of automobile air bags as an example of engineers who had the foresight to carefully track the technology on the road to discover problems as early as possible.

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