might require engineers to take into account different possible perspectives and thus to look beyond their internal design team norms (Van Gorp, 2005).

Although it might seem to follow that in general radical design is morally more dubious than normal design, radical design can be morally warranted in situations where good reasons exist to doubt the moral adequacy of a current regulative framework. Take the case of crash safety regulations for example; at present these tend to focus on people inside the car, paying little attention to other unprotected road and pavement users such as cyclists and pedestrians (cf. Van Gorp, 2005).[12]

References

Arbeidsomstandighedenbesluit, 2004, SdU Uitgevers, The Hague.

European Committee, 1999, Guide to the implementation of directives based on New Approach and Global Approach, Brussels.

Grunwald, A., 2000, Against over-estimating the role of ethics in technology development, *Sci. Eng. Eth.* **6**(2):181–196.

Grunwald, A., 2001, The application of ethics to engineering and the engineer's moral responsibility: perspectives for a research agenda, *Sci. Eng. Eth.* **7**(3):415–428.

Hunter, Th. A.,1997, Designing to Codes and Standards, in: *ASM Handbook*, G.E. Dieter and S. Lampman, eds., pp. 66–71.

Polanyi, M., 1962, *Personal Knowledge*, University of Chicago Press, Chicago.

Van de Poel, I. R., 2001, Investigating ethical issues in engineering design, *Sci. Eng. Eth.* **7**(3):429–446.

Van de Poel, I. R., and Van Gorp, A. C., 2006, The need for ethical reflection in engineering design; the relevance of type of design and design hierarchy, *Sci. Technol. Hum. Valu.* **31**(3):333–360.

Van der Burg, S., and Van Gorp, A., 2005, Understanding moral responsibility in the design of trailers, *Sci. Eng. Eth.* **11**(2):235–256.

Van Gorp, A., and Van de Poel, I., 2001, Ethical considerations in engineering design processes, *IEEE Technol. Soc. Mag.* **21**(3):15–22.

Van Gorp, A. C., 2005, *Ethical Issues in Engineering Design; Safety and Sustainability*, Simon Stevin Series in the Philosophy of Technology, Delft.

Vincenti, W. G., 1990, *What Engineers Know and How They Know It*, John Hopkins University Press, Baltimore and London.

Vincenti, W. G., 1992, Engineering knowledge, type of design, and level of hierarchy: further thoughts about what engineers know …, in: *Technological Development and Science in the Industrial Age*, P. Kroes and M. Bakker, eds., Kluwer, Dordrecht, pp. 17–34.

World Commission on Environment and Development [WCED], 1987, *Our Common Future*, Oxford University Press, New York and Oxford.

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