

SE Code of Ethics section eight speaks to Software Engineers' duty to self. These duties are divided into three main sections: improving knowledge and understanding, improving abilities and skills, and upholding respectful behavior. The two improvement sections encourage life-long development of the notions dictated in the previous seven sections; respective behavior discourages prejudice and encourages software engineers to further the Code in themselves and others.

Therac-25

Because the issues present with the Therac-25 device were the result of software engineering error, it is clear that the software engineer responsible for the Therac-25 programming failed to uphold the Software Engineering Code of Ethics in a number of ways.

First, code 8.02 was violated. The engineer failed to further their ability to create safe and reliable software.

Second, the engineer failed completely to follow code 8.03. Though the Therac-25 operating system displayed error codes, the associated documentation neglected to explain ANY of the errors. This led technicians to ignore errors and destroy patients with radiation.

Third, the engineer also failed to follow code 8.04. It appears that the importance of, and danger present in, the environment in which the software was to be used was not fully grasped by the programmer. This is evident by the lack of sufficient unit and system testing, which resulted in death.

Fourth, code 8.05 was also neglected. Indeed, more than 2700 hours of testing would be standard for such a critical and dangerous medical device.

The Therac-25 incident illustrates an abject failure of software engineering; many of the fundamental principals present in the Software Engineering Code of Ethics were violated, and as a result, peoples' lives were ruined.

Unskilled and Unaware

Software engineers need to be realistic about their capabilities when taking on a project. Software Engineers need to be aware of their strengths and weaknesses and improve their weaknesses.

True Reliability

Software engineers need to stay current with reliability and testing research to improve the products they produce.

Rational Design

The Software Engineering Code of Ethics section 8.03 states that Software Engineers shall, "Improve their ability to produce accurate, informative, and well-written documentation". As the paper on Rational Design states, by creating documentation to simulate the rational design process, software engineers can ensure that "the result is a product that can be understood, maintained, and reused".

Process of Incompetence

The Software Engineering Code of Ethics section 8.03 states that Software Engineers shall, "Improve their ability to produce accurate, informative, and well-written documentation". However, the process of incompetence describes how incompetent organizations claim that "planning is useless, the situation changes too fast". This conflicts with the SE Code, which demonstrates yet another reason not to work for an incompetent organization.

No Silver Bullet

In "No Silver Bullet," pp. 13-14, Brooks believes the difference between good software designs and great designs comes from great designers. He further states the most important single effort one can mount is to develop ways to grow great designers. One strategy he suggests for cultivating designers is to devise and maintain a career development plan. Another strategy is to provide opportunities for designers to interact with each other. Such actions would reinforce the following three codes: 8.01, 8.02 and 8.03.

On Testing Non-testable Programs

Non testable programs are ones for which the output cannot be verified for correctness. According to the SE code of ethics, section 8.01, it is the developer's responsibility to become familiar with the area in which he is programming so that he can better analyze the program's output when no oracle is available. Elaine Weyuker's paper also relates to section 8.02 of the SE code in a similar way. Developers should improve their ability to "create useful quality software ... within a reasonable time"