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Question 1

Between June 1985 and January 1987, six know accidents of massive overdoses of radiation by, computer controlled radiation therapy machine, Therac – 25 were reported. Resulting in deaths and serious injuries. Therac – 25 accidents are the most serious computer – related accidents to date.

Newly developed Therac – 25 remarkably was more compact, more versatile, and easier to use. Therac-25 used the “double-pass” concept, which needs much less space to develop comparable energy of the Therac – 6 and 20.

Atomic Energy Canada Limited, the Canadian developers of the Therac machines, violate Principle Three of the Software Engineering when they released Therac – 25. Principle Three of the code of ethics states, ““Software engineers shall ensure their products and related modifications meet the highest professional standards possible”. AECL did not meet the highest professional standards possible for the Therac – 25 software. It is inferred the problem was caused by re-using software from an older model machines, the Therac – 6 and 20. A letter to a Therac – 25 owner, by the AECL quality assurance manager stated, “... Therac – 6 package was used by the AECL software people when they started the Therac – 25 software”.

AECL took advantage of the computer’s abilities to control and monitor the hardware and decided not to duplicate all the existing safety mechanisms and interlocks. Software developers did not ensure their product implemented the necessary modifications. Unknown to quality assurance manager some of the Therac- 20 routines were used in the Therac -25. They discovered this after Therac – 25 bug accident was also found in Therac-20 software.

Therac machines software functionality was limited. Software merely added accessibility to the existing hardware, which could stand alone. Hardware safety feature and interlocks in the underlying machines were retained.

The three most significant lessons to be learned from this incident are to properly modify and update re-used software, rigorously test software, and/or retain safety feature at all time due to its import ants.

“Principle 1.03. Approve software only if they have a well-founded belief that it is safe, meets specifications, passes appropriate tests, and does not diminish quality of life, diminish privacy or harm the environment. The ultimate effect of the work should be to the public good” from the Software Engineering Code of Ethics can be expected to mitigate re-occurrences of such incidents.

Question 2

Principle two and four are relevant, the specialist abided by neither of the principles. The specialist did not communicate the installations to the employer and specialist should maintain independence in their professional judgment. It is Rick’s responsibility to notify his employer of any system changes and to conserve employer integrity. Rick’s action is beneficial to the FBI, because they are able to monitor more areas with access to the company’s cameras. Common-Good for the public and virtue of personal benefits are Ethical- Decision-Making problems that could produce Rick to disregard the employee judgement ethic.