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CS 230 Lab Sec 004

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Assignment 1

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1.

a. The Therac-25 medical accelerator. This was an improved radiation therapy device system that could deliver a low-power electron beam or X-rays. The X-rays smashed high powered electrons into a metal target between the gun and a patient. The Therac-25 was an improvement from the Therac-20 which replaced the electromechanical safety interlocks with software control, which was perceived to be more reliable. The operating system, however, had been jumbled together by an uneducated programmer with no formal training. This brought up a bug called a “race condition” where they could accidentally set the beam in high power mode with the metal target out of position. This resulted in at least 5 deaths and others seriously injured.

b. National Cancer Institute, Panama City, November 2000. Multidata system's software allows a radiation therapist to draw on a computer screen metal shields called “blocks” to protect healthy tissue from radiation. The software only allows the use of four blocks, but the Panamanian doctors wanted to use five. They figured a way around this by creating one large block with a hole in the middle. But depending on how the hole was drawn, the software configured different answers than what the doctors were expecting. This caused some doses to have correct calculations while others were dosed at twice the exposure of radiation. This resulted in at least 8 patients' deaths, with another 20 patients with significant health problems. The physicians who were legally required to double-check the calculations were indicted for murder.

2.

A. No, because the software deals with keeping track of hospital patients. Any bugs that are in this software could cause damage to the patients, such as getting names mixed up, causing nurses to give them doses of medicine that shouldn’t be given to them.

B. The client and the public will benefit from this decision, in which there won’t be any mistakes by fault of our company. The company could also benefit from this decision because it wouldn’t be getting sued for malfunctioning software if something were to happen.

C. The company’s profits will be harmed because it won’t be “first to the market” on releasing its new product and potentially go out of business.

D. I have an obligation to the company, but not at the risk of potentially ruining the lives of hospital patients.