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Computer Systems Engineering

Verification and Validation of Software

Homework # 1: Software Failure Case

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Software Failure Case: Ariane 5 Rocket Failure

**Where (what company)?** European Space Agency.

**When?** June 4,1996.

**Losses?** Approximately $370 million.

**Result?** The rocket completely disintegrated just 37 seconds after liftoff.

**On June 4, 1996, the European Space Agency's (ESA) Ariane 5 rocket suffered a failure just 37 seconds after launch. This rocket was part of a heavy-lift rocket program designed to carry satellites into space, and hundreds of millions of dollars had been spent in the project.** (Agency, 1996)

**The primary cause of this failure was a software error in the guidance system. When the system attempted to convert a large decimal number to an integer, the number was larger than the permissible limit, resulting in an overflow error. Because the system was not handle this type of error, it issued incorrect commands to the rocket, causing it to go astray and crash shortly after launching.** (wikipedia, 2024)

**It is considered one of the most famous disasters resulting from incorrect programming due to the size of the losses it causes, which highlights the importance of verifying the accuracy of software, especially in sensitive systems such as those related to space.** (video, 2016)

# References

Agency, T. E. (1996). *Presentation of Inquiry Board report*. Retrieved from https://www.esa.int/Newsroom/Press\_Releases/Ariane\_501\_-\_Presentation\_of\_Inquiry\_Board\_report

video. (2016). Retrieved from https://youtu.be/N6PWATvLQCY?si=WC0dRZAQPIGT88mP

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